

GOSFORD TO OURIMBAH ELECTRICITY SUPPLY UPGRADE

Director-General's Report
Section 115C
of the Environmental
Planning and Assessment Act

February, 2002

Please note that Figure 1 referred to in this report does not appear in this electronic version.

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Foreword

EnergyAustralia has sought the approval of the Minister for Planning under Section 115B of the Environmental Planning and Assessment (EP&A) Act 1979 for the construction of a new 132kV transmission line between Gosford and Ourimbah.

This report has been prepared in accordance with Section 115C of the EP&A Act which requires that the Minister obtain a report from the Director-General of Planning prior to making a decision.

This report assesses the environmental impact statement, the issues raised in the representation made in response to its exhibition, the submission from EnergyAustralia in response to the representation, and other relevant matters pertaining to the potential environmental impacts of the proposal. It found that the proposal is likely to increase the security and reliability of electricity supply to the Central Coast area.

Construction will have a number of temporary local impacts, including noise, traffic, air quality and community impacts. These impacts can be mitigated to acceptable levels by adopting management measures referred to in this report, in particular, the development of a construction environmental management plan, and reflected in the recommended conditions of approval.

Any operational stage impacts are likely to be minimal. The Department recommends the development of an operation environmental management plan to deal with any residual impacts.

The proposal is recommended for approval subject to the recommended conditions.

Sue Holliday
Director-General
Department of Planning

Table of Contents

Foreword	iii
List of Figures	vi
Glossary	vii
EXECUTIVE SUMMARY	ix
1 INTRODUCTION	1
1.1 PURPOSE OF THE REPORT	1
1.2 STATUTORY PROVISIONS.....	1
1.3 PREPARATION AND EXHIBITION OF THE EIS.....	1
1.4 REQUEST FOR THE APPROVAL OF THE MINISTER FOR PLANNING.....	2
2 THE CURRENT PROPOSAL	3
2.1 BACKGROUND	3
2.2 PROJECT DESCRIPTION	4
2.3 ALTERNATIVES CONSIDERED	7
3 SUMMARY OF REPRESENTATIONS	9
4 ASSESSMENT OF KEY ISSUES	10
4.1 NEED FOR THE PROPOSAL	10
4.2 FLORA AND FAUNA	11
4.3 ELECTRIC AND MAGNETIC FIELDS	14
4.4 VISUAL IMPACT	16
4.5 WATER QUALITY.....	17
4.6 NOISE AND VIBRATION.....	18
4.7 SOILS, GEOLOGY AND CONTAMINATION	19
4.8 HERITAGE	21
5 ASSESSMENT OF OTHER ISSUES	24
5.1 AIR QUALITY.....	24
5.2 TRAFFIC AND ACCESS	25
5.3 HYDROLOGY AND FLOODING	26
5.4 LAND TENURE AND USE IMPACTS.....	27
5.5 PROPERTY EFFECTS.....	28
5.6 IMPACTS ON THE COMMUNITY	28
5.7 HAZARDS, RISKS AND PUBLIC SAFETY	29
5.8 WASTE MANAGEMENT AND REUSE.....	29
5.9 CUMULATIVE IMPACT	30
6 CONCLUSIONS AND RECOMMENDATIONS	31
7 RECOMMENDED CONDITIONS OF APPROVAL	33

LIST OF FIGURES

- Figure 1: Proposed Transmission Line Route
- Figure 2: Typical magnetic fields from transmission lines in the Gosford area
- Figure 3: Typical electric field from 132kV wood/concrete pole construction
- Figure 4: Estimated traffic generation during construction

GLOSSARY

ASS	Acid Sulphate Soils
dB(A)	Decibel (A-weighted scale)
Department, the	NSW Department of Planning ('the Department')
Director-General	Director-General of the Department of Planning (or delegate)
Director-General's Report	The report of the Director-General of the Department of Planning, prepared under section 115C of the EP&A Act
DLWC	Department of Land and Water Conservation
EIS	Environmental Impact Statement
EMF	Electric and Magnetic Fields
EMP	Environmental Management Plan
EMR	Environmental Management Representative
ENCM	Environmental Noise Control Manual
EnergyAustralia	The Proponent
EP&A Act	Environmental Planning and Assessment Act 1979 ('the Act')
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
kV	Kilovolts (1000 volts)
L ₁₀	The noise level, which is exceeded for 10 percent of the time and is approximately the average of maximum noise level.
LALC	Local Aboriginal Land Council
mG	Milligauss – Magnetic fields are commonly measured in Gauss (G)/milligauss ((mG).
Minister, the	Minister for Planning
NPWS	National Parks and Wildlife Service
Proponent	EnergyAustralia
Relevant Councils	Gosford City Council, Wyong Shire Council
Representations Report	'Gosford to Ourimbah Electricity Supply Upgrade Representations Report' prepared by EnergyAustralia and dated October 2001
RIC	Rail Infrastructure Corporation

ROIP	Route Options Issues Paper
RTA	Roads and Traffic Authority
STS	Sub-transmission Substation
TSC Act	Threatened Species Conservation Act 1995

EXECUTIVE SUMMARY

The Proposal

EnergyAustralia is seeking the approval of the Minister for Planning for the proposed upgrade of the existing electricity supply network between Gosford and Ourimbah. The upgrade involves constructing a 132kV overhead power transmission line, approximately 11 kms long, between the Gosford Sub-Transmission Station (STS), West Gosford Zone Substation and the Ourimbah STS. Upgrading works at these substations are also required as part of the proposed development. *Figure 1* shows the proposed route of the line.

The estimated cost of the proposal is \$17 million, including \$5 million for line construction and \$12 million for substation upgrade works. Construction of the transmission line is expected to take approximately 14 months and is targeted for commissioning in April 2003.

Background to the Proposal

The Central Coast has the fastest growing demand for electricity of any region serviced by EnergyAustralia. This demand is growing by three percent a year and is being driven by strong population growth, increased commercial activity, expansion of community facilities and services, and an increased reliance on electricity generally.

EnergyAustralia estimates that the supply system is currently operating at or near capacity. To keep pace with future growth, it needs to strengthen the local electricity supply network. This involves building a new 132kV overhead power transmission line between Gosford and Ourimbah.

EnergyAustralia has conducted an extensive community consultation process in the selection of the route for the proposed transmission line. The proposed route was selected taking into account environmental, technical, social and financial issues.

Need, Justification and Benefits

The need for the proposal was determined by a number of key factors:

- ❑ meeting demand that is currently nearing or above capacity by supplying additional power to the south Central Coast area;
- ❑ addressing supply problems in a timely and cost-effective manner to meet existing deficiencies;
- ❑ providing a relatively long term solution, in view of demand that is projected to continue to increase over the next 10-20 years; and
- ❑ considering the community and environmental impacts of upgrading power supply in the local, regional and global context.

EnergyAustralia justified the preferred option mainly on environmental and economic grounds. In comparison with the various options evaluated, the proposed line was considered to have relatively minor environmental impacts due to the relatively short length of the proposed new transmission line, and its location in disturbed areas (largely within existing transport corridors). It also does not limit the development or use of

sustainable energy technologies in the future as it would be capable of transmitting electricity from any generation source that feeds into the network, including solar or wind power.

The proposed line is able to be built within a relatively short time (approximately 14 months) and its capital and recurrent costs are relatively small in comparison with other options. It is expected to delay the need for further upgrades to the supply to the Gosford STS until 2010.

The major benefits of the proposal, as identified in the EIS, are:

- introduction of a new, reliable transmission line to an area experiencing unstable electricity supply;
- provision of access to electricity sources offering competitive pricing and access to alternative electricity generators;
- provision of economic benefits to the Central Coast through maintaining a reliable electricity supply which could stimulate further growth in the local economy; and
- low social impacts along much of the route.

EIS Exhibition

The EIS was publicly exhibited from 29 June 2001 to 3 August 2001. Only one representation was received by EnergyAustralia as a result of the exhibition of the EIS. This came from the Central Coast Community Environment Network Inc (CCCEN), which expressed concern about flora and fauna issues along the proposed route.

Section 3 of the report provides details on the issues raised in the representation. No changes were made to the proposal following the exhibition of the EIS.

Key Issues

The key issues raised in the EIS and the representation received included flora and fauna issues, noise and vibration management, water quality, electric and magnetic fields, visual impact, heritage, and soil and contamination issues.

The Director-General's overall assessment of the proposal is provided in sections 4 and 5 of this report.

Conclusions and Recommendations

The proposal is likely to increase the security and reliability of electricity supply to the Central Coast area. EnergyAustralia has considered the issue of environmental impact of the proposal at different stages of its development including during options consideration, route selection phase and consideration of environmental management measures.

Construction will have a number of minor, temporary local impacts including noise, traffic and community impacts. With appropriate management, these impacts are controllable to acceptable levels. These impacts also need to be seen in the context of the identified advantages of the new line.

No significant impacts are expected at the operational stage.

On the basis of the assessment conducted for the EIS, the representation received, supplementary information obtained from the Proponent, and the findings of this assessment report, it is concluded that the environmental impacts associated with the proposal could be managed to an acceptable level.

It is recommended that the proposal be approved by the Minister for Planning subject to the recommended conditions of approval specified in Section 7 of the Director-General's assessment report. These conditions relate to:

- community notification and liaison during construction, including procedures to manage and resolve complaints;
- preparation of construction and operation EMPs covering issues such as:
 - demand management
 - flora and fauna;
 - noise and vibration;
 - air quality;
 - soil and water management;
 - acid sulphate soils management;
 - traffic management;
 - heritage management
 - waste management and reuse;
 - construction safety;
 - management of emergency events
- specific conditions addressing heritage/archaeology, visual impact, and utilities and services;
- environmental monitoring and reporting requirements; and
- independent auditing.

1 INTRODUCTION

1.1 PURPOSE OF THE REPORT

The purpose of this report is to provide an independent assessment of the Environmental Impact Statement (EIS) for the proposal, the issues raised in the representation to the public exhibition, submissions made by the Proponent and other matters pertinent to the potential environmental impact of the proposal.

This report is prepared in accordance with Section 115C of the Environmental Planning and Assessment Act 1979 (EP&A Act), which requires the Director-General of the Department of Planning to assess and report to the Minister for Planning on the proposal.

The report documents the outcome of an independent environmental impact assessment by the Department.

1.2 STATUTORY PROVISIONS

EnergyAustralia is the Proponent of the proposal to upgrade electricity supply to the southern section of the Central Coast through the construction of a new 132 kV overhead transmission line between Gosford and Ourimbah. EnergyAustralia is a State-owned corporation and public authority, responsible for the distribution and retailing of electricity.

Development proposals by EnergyAustralia are subject to the requirements of the EP&A Act. As development consent is not required and an EIS has been prepared, Division 4 of Part 5 applies.

Upgrading works with Substations

Associated with the proposed transmission line are upgrading works at the West Gosford Zone Substation, Gosford Sub-Transmission Substation and Ourimbah Sub-Transmission Substation. These works (outlined in section 2.2.1 of this report) fall under Part 5 of the EP&A Act and are permissible without consent of the relevant Councils (Gosford City Council and Wyong Shire Council) by virtue of clause 35(a) of the Model Provisions which has been adopted in these Councils' local planning instruments. EnergyAustralia advised that an exception to this is the proposed extension to the control/switch room and construction of a new driveway at West Gosford Zone Substation, for which Gosford Council has granted development consent.

1.3 PREPARATION AND EXHIBITION OF THE EIS

On 11 February 2001, EnergyAustralia sought the requirements of the Director-General of the Department of Planning on requirements as to the form and content for an EIS for the proposal. The Director-General's requirements were issued to EnergyAustralia in a letter dated 7 March 2001.

The EIS was exhibited between 29 June 2001 and 3 August 2001 inclusive. Public display locations and times were advertised in the local and state papers, in accordance with the EP&A Act.

Only one representation was made to EnergyAustralia. A copy of this was received by the Department on 22 August 2001

1.4 REQUEST FOR THE APPROVAL OF THE MINISTER FOR PLANNING

In accordance with Section 115B of the EP&A Act, EnergyAustralia sought the approval of the Minister for the project in a letter dated 10 October 2001. This was accompanied by a report (hereafter referred to as the 'Representations Report') addressing issues raised in the representation received from the public exhibition of the EIS.

2 THE CURRENT PROPOSAL

This section provides a background to the proposal and description of the project as outlined in the EIS. It also describes the current proposal for which EnergyAustralia is seeking the Minister's approval.

2.1 BACKGROUND

The Central Coast has the fastest growing demand for electricity of any region serviced by EnergyAustralia. Over the last decade, the southern region of the Central Coast has experienced an increase in electricity demand at an average rate of more than three percent a year. Driving the demand are strong population growth, increased commercial activity, expansion of community facilities and services, and an increased reliance on electricity generally.

The aim of the proposed project is to provide a reliable and safe supply of electricity to the Central Coast area and to keep pace with future growth. EnergyAustralia estimates that the supply system is currently operating at or near capacity. The two key but separate supply system deficiencies are:

- the capacity of the 132kV supply to Gosford STS, notably the capacity of the Gosford – Sydney East 132kV feeder;
- the capacity of the smaller substations and 33kV and 66kV lines supplying substations in the local Gosford area, in particular, the capacity of the West Gosford Zone Substation.

These supply system deficiencies are due to limitations involving the amount of electricity that sub-transmission networks can carry.

Load forecasts for electricity demand at Gosford STS indicate a 3% yearly increase to 2004, then to 2% growth after that. Based on current projections, the installation of a new 132kV transmission line serving substations between Gosford and Ourimbah would provide acceptable levels of supply to Gosford STS until 2010. At a more local level, the upgrading of West Gosford Zone Substation to 132/11kV operation is expected to meet the needs of residential and commercial properties in Gosford until 2015.

The consequences of EnergyAustralia doing nothing compared with the proposed upgrade would mean more frequent supply interruptions would occur in the near future. These would be disruptive to commercial enterprises and to residences throughout the area. Unless the existing electricity supply capacity is increased, rationing of electricity will be required after 2003 during outages of the Tuggerah line at times of peak demand. It is also likely to limit the commercial growth potential of the Central Coast area.

2.2 PROJECT DESCRIPTION

2.2.1 The Proposal as described in the EIS

The proposal involves augmenting the existing electricity supply network by upgrading the electricity line between Gosford and Ourimbah STSs to 132kV, via West Gosford Zone Substation.

The length of the proposed line is approximately 11 kilometres. The proposed route (based on Option D, discussed in Section 2.2.3) is shown in *Figure 1*. The majority of the line would be in existing road verges. In some sections, the line would replace existing lower voltage lines, while in other areas an entirely new line would be constructed.

The construction of a new 132kV line essentially consists of three activities: replacing existing 33kV and 66kV lines; double circuiting of existing 33kV and 66kV lines; and construction of new lines. Details of these, as described in the EIS, include:

- Replacing the existing 33kV line (feeder 722) from West Gosford Zone Substation to Gosford STS with a 132kV line;
- Replacing a section of the existing 33kV line (feeder 790) with a 132kV line from West Gosford Substation to the corner of Manns Road and Dell Road;
- Replacing the existing 66kV line (feeder 824) with a double circuit (132kV and 66kV) line from the corner of Manns Road and Dell Road to Perina Road;
- Constructing a new 132kV line along Perina Road, Glennie St West, Showground Road, Manns Road, Narara Valley Drive to Narara Railway Station;
- Continuing construction of a new 132kV line along Koninderie Parade and following the western side of the railway to Niagara Park Railway Station;
- Continuing construction of a new 132kV line along Railway Crescent and the Pacific Highway on the western side of the railway to a point determined to be technically suitable to cross the railway (most likely around Teralba St);
- Crossing the railway to the existing 33kV line (feeder 799);
- Replacing the existing 33kV line (feeder 799) with a double circuit (132kV and 33kV) line to Ourimbah STS.

In addition to the construction of the 132kV line, the following upgrade works are proposed at the following substations to accommodate the new line:

- West Gosford Zone Substation – upgrading of the 33kV switchyard with a 132kV equipment; replacement of four 12 megavolt ampere (MVA) transformers with three 50 MVA transformers; and extension of the switchroom on the western side to allow the installation of additional equipment;
- Gosford Sub-Transmission Substation – only minor works would be required, including installation of an additional 132kV feeder bay containing a circuit breaker and two isolators; and
- Ourimbah Sub-Transmission Substation - only minor works would be required, including installation of an additional 132kV feeder bay containing a circuit breaker and two isolators.

Figure 1: Proposed Route of the Gosford to Ourimbah Transmission Line
(Source: Figure 5-1 of the EIS – Alignment of the Preferred Route)

2.2.2 Construction Methods, Equipment and Timing

The EIS discussed in detail the works involved in the project, from preparation of the easement, construction of the line, to line operation and maintenance.

The proposed line will be strung using the 'tension stringing' method. The stringing process for erecting the overhead conductors and earthwires involves specialised equipment (eg winches, tensioners, pulleys) and procedures, which are described in the EIS.

Energy Australia aims to have the transmission line commissioned in April 2003. It advised that construction of the line would involve approximately 194 poles and be undertaken in seven sections:

Section 1: Ourimbah Sub-Transmission Station to the corner of Pacific Highway and Teralba Street, Lisarow.

Section 2: Corner of Pacific Highway and Teralba Street, Lisarow to Railway Crescent at Niagara Park Railway Station.

Section 3: Railway Crescent at Niagara Park Railway Station to Narara Valley Drive at Narara Railway Station.

Section 4: Narara Valley Drive at Narara Railway Station to southern end of Perina Road, Gosford.

Section 5: Southern end of Perina Road, Gosford to Manns Road (halfway between Dell Road and Dignity Crescent).

Section 6: Manns Road, Gosford (halfway between Dell Road and Dignity Crescent) to West Gosford Zone Substation.

Section 7: West Gosford Zone Substation to Gosford Sub-Transmission substation.

Sections 7 and 6 will be completed first due to West Gosford Zone Substation Stage 1 commissioning, followed by Sections 1 to 5.

2.2.3 Route selection

EnergyAustralia conducted a comprehensive and structured route selection process, in consultation with the local community over a period of 12-18 months. The decision on the preferred route was made using information from the Route Options Issues Paper (ROIP), results of the Multi Criteria Analysis (MCA) Workshop, technical investigations and feedback received from the community.

The EIS provided a summary of the ROIP, subsequent additional options and the route selection process carried out. There were four route options and a number of sub-options in the ROIP:

- Option A – Western option through Strickland State forest;
- Option B – Central option through Niagara Park;

- Option C – Eastern option through Lisarow and Narara; and
- Option D – a variation of the Option C route corridor (this was suggested by the Community Working Group).

All of the main options pass within or parallel to existing transmission line easements. Most route options involve upgrading part or all of an existing 33kV power line between Gosford STS and West Gosford Zone Substation to 132kV.

Option D, which predominantly follows the rail corridor all the way between Gosford and Ourimbah, was chosen as the preferred route. Options were assessed against the main decision criteria of technical reliability, financial cost, social impacts and environmental impacts. Different weightings were given to these criteria. The EIS stated that approximately half (40% to 50%) of the emphasis in the MCA was given to social factors, of which the great majority (90% to 95%) related to Electric and Magnetic Field (EMF) issues. Financial and Environmental factors shared the remainder, the latter given the greater importance.

Underground Transmission Lines

The ROIP also considered underground cables as an alternative method to overhead transmission lines for upgrading electricity supply. However, a comparison of the impacts of these two methods concluded that underground cables do have numerous environmental impacts (eg potential for more damage to flora and fauna, greater erosion potential and disturbance of acid sulphate or contaminated soils) and are significantly more expensive than overhead lines (in the order of 10-20 times).

2.2.4 The Environment along the preferred route

The preferred route passes through mainly urban areas within the localities of West Gosford, Narara, Lisarow and Ourimbah. The route heads south from the Gosford STS through industrial land and across Narara Creek before passing through or near a mix of land uses including bushland, residential areas and open space corridors.

The route traverses Narara Creek and associated riparian and aquatic vegetation zones at three locations. Beyond the creek channel and banks, native vegetation is largely absent from the route. The southern section of the route is predominantly within urban areas while the northern section is predominantly within road or rail corridors. The topography of the route is generally relatively flat, rising gently towards the north.

2.3 ALTERNATIVES CONSIDERED

The EIS evaluated a range of alternative electricity supply and management options based on economic, social and environmental considerations. A summary of these options and conclusions of the evaluation are as follows:

- **Do nothing option** – this option would result in shortages of power supply to the south Central Coast area, increase maintenance costs for the supply system, and increase the risk of accidents.

- **Alternative power generation options** (eg solar or wind power, natural gas fuelled generators) – these do not represent viable options because they would generally feed into the network and require some form of upgrade of the local supply system. In addition, they are found to be not practical, cost effective or environmentally appropriate for the Central Coast area.
- **Demand management approaches** – these are partially reliant on consumer preferences and actions of other agencies, eg changes to local government regulations requiring installation of energy saving devices. EnergyAustralia considers that these approaches, based on current technology, costs and consumer preferences, are highly unlikely to avoid the need for upgrading supply. It was not treated as a viable alternative.
- **Transmission development** – construction of new 330kV/132kV substation and 132kV line is not viable on financial grounds.
- **Sub-transmission line development** – four alternative options were considered using this approach. With the exception of Option 2: New 132kV Gosford to Ourimbah line (\$2.2 million), the economic and environmental costs of these options are considered prohibitive at this stage.
- **Upgrade West Gosford Zone Substation** – two of the three options considered under this approach would provide only relatively short term solutions to the supply problems of the area, particularly when assessed in relation to capital costs. The exception to this is Option 3: Upgrade West Gosford Zone Substation to 132kV (\$9 million).

The preferred option involves upgrading the sub-transmission line between Ourimbah and Gosford STSs (Option 2), along with upgrading of West Gosford Zone Substation (Option 3) which were considered to provide a viable solution.

3 SUMMARY OF REPRESENTATIONS

Only one representation was received by EnergyAustralia as a result of the exhibition of the EIS. This came from the Central Coast Community Environment Network Inc (CCCEN), which submitted the following comments:

- concern about the riparian wetland and rainforest remnants along the proposed route, particularly areas near Ourimbah and Lisarow stations, across Wingelo Creek and along Narara Creek;
- given that the proposed line would cross Narara Creek three times, concern that the riparian corridor is not further damaged or fragmented because it provides an important link for wildlife;
- request for consultation with the coordinator of the Central Coast Riparian Rehabilitation Project regarding restoration works being carried out along Narara and Wingelo Creeks that could be affected by the proposed line.

In accordance with the requirements of the EP&A Act, EnergyAustralia forwarded to the Department a copy of the representation received following the close of the exhibition period. In its Representations Report dated October 2001, it included a summary of the matters raised in the representation and a response to these matters.

There were no modifications to the proposal as a result of the EIS exhibition.

4 ASSESSMENT OF KEY ISSUES

This section outlines the Department's consideration of the key issues relating to the current proposal having regard to information presented in the EIS, the representation received in response to its exhibition and other additional information obtained by the Department.

EnergyAustralia has also provided the Department with its response to the issues raised in the representation and the Department has reviewed this.

Where considered appropriate, recommendations are made with regard to the manner in which a particular issue should be addressed during construction and/or operation.

4.1 NEED FOR THE PROPOSAL

4.1.1 Background

The EIS stated that the projected growth in electricity demand in the Central Coast within the next 10 years and the need to maintain reliable electrical supply dictated the need for the proposed electricity supply upgrade. Based on current projections (see section 2.1), the installation of a new 132kV transmission line serving substations between Gosford and Ourimbah STSs would provide acceptable levels of supply to Gosford STS until 2010.

EnergyAustralia evaluated a number of alternative electricity supply and management options in the selection of a preferred system. These options consisted of maintaining the current supply infrastructure and a range of sustainable energy options - solar power, wind power, demand management, transmission development, sub-transmission line development, etc. It justified the proposed construction of a new 132 kV transmission line as being the most viable option in terms of timeliness, cost effectiveness, minimal social and environmental impacts, community preference and provision of a long term solution.

4.1.2 Key Issues

There were no public concerns raised from the exhibition of the EIS regarding the need for the proposal. However, at a broader level, there are concerns with increasing electricity consumption because of the resultant greenhouse gas emission.

4.1.3 Consideration

The EIS discussed demand management in its consideration of alternative options. There are a number of features which could limit demand growth. According to the EIS, much of the new load in the West Gosford area is from new dwellings which tend to be reasonably efficient. It would also be possible to encourage the purchase of efficient appliances and fittings (but there is no guarantee that these will not be replaced with standard models in a few years). In addition, natural gas is available in most new subdivisions, and typically captures a high proportion in heating, hot water and cooking loads.

However, the EIS claimed that as load growth in this area is high (between 3% and 5% per year), demand side management is unlikely to completely avoid the need for a new transmission but may delay pressure for a short period of time. It concluded that in the

absence of radical changes in the approach to demand side management, there is little chance of efficiency gains keeping pace with the high load growth in this area.

The Department notes these arguments and particularly that with population growth and commercial development, it would be extremely difficult to adequately constrain growth. It therefore accepts that there is a need for the Proponent to ensure supply reliability. However, it remains important that the growth in electricity use and greenhouse gas emissions be contained as far as practicable. To this end, the Department recommends Condition of Approval No 27 that requires the Proponent to address, under the Operation EMP, measures to reduce the demand for energy/greenhouse gas emissions, and to outline how such measures will be implemented and success monitored.

4.2 FLORA AND FAUNA

4.2.1 Background

As part of the Route Options Issues Paper, Ecotone Ecological Consultants Pty Ltd conducted general investigations to identify likely constraints to the route in terms of flora and fauna issues. Following selection of a preferred route, Ecotone then undertook a detailed flora and fauna study for the proposal (Appendix D to the EIS) which is summarised in the EIS. Ecotone's assessment was undertaken in accordance with the Threatened Species Conservation Act 1995 (TSC Act) and the Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act).

One threatened flora species, Biconvex Paperbark - *Melaleuca biconvexa*, and one endangered ecological community, Sydney Coastal Estuary Swamp Forest Complex, listed under the Threatened Species Conservation Act 1995 were recorded in the study area. No threatened fauna species were identified in the surveys conducted along the proposed route or immediate locality. However, based on a fauna habitat assessment, 15 threatened fauna species could be present. Assessment of Significance (8-part tests under Section 5A of the EP&A Act) were conducted for 16 threatened species and one endangered ecological community. It was concluded that the proposal is unlikely to cause a significant impact.

The EIS indicated that the preferred route has been identified to minimise the potential to affect matters of National Environmental Significance under the Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act). It stated that the proposal does not trigger any of those matters and thus, the proposal would not need to be referred to Environment Australia.

Ecotone's Flora and Fauna Assessment Report recommended a range of ameliorative measures to minimise disturbance to remnant natural vegetation and fauna habitat along the proposed route, particularly where threatened or significant species/communities exist or could potentially occur (see section 5, Appendix D to the EIS). Site-specific recommendations were also made for parts of the route which contain significant vegetation or fauna habitat.

4.2.2 Key Issues

EnergyAustralia has advised that the exact alignment of the route, including pole locations, will not be known until completion of the detailed design.

The representation from the Central Coast Community Environment Network Inc (CCCEN) raised the following issues:

- concern about riparian wetland and rainforest remnants along the proposed line particularly areas near Ourimbah and Lisarow stations, across Wingelo Creek and along Narara Creek;
- given that the proposed line would cross Narara Creek three times, concerns that the riparian corridor not be further damaged or fragmented because it provides an important link for wildlife;
- request for consultation with the coordinator of the Central Coast Riparian Rehabilitation Project regarding restoration works being carried out along Narara and Wingelo Creeks.

The Department also raised some issues, including clarification/commitment on certain actions, as follows:

- the EIS proposes a range of mitigation measures to minimise impacts to flora and fauna. However, as the measures are only recommendations, the Department sought clarification on which of these measures will be implemented;
- the 8-part test for Biconvex Paperbark only refers to this species as occurring at one location although Figure 3 and elsewhere in the Flora and Fauna Assessment Report, two locations are referred to. There was also no discussion of this species being a major component of a remnant of the community of Sydney Coastal Estuary Swamp Forest Complex;
- complete avoidance of individuals of Biconvex Paperbark through strategic routing of the powerline easement, in particular, locating the powerline along the western side of Railway Crescent;
- if removal of any Biconvex Paperbark is required, then a referral should be made to Environment Australia to determine whether this impact is likely to be significant under the EPBC Act and Commonwealth approval is required;
- determine if an 8-part test is required for the threatened Grey-headed Flying Fox. This species was not considered in the Flora and Fauna Report, and it is likely to occur in the study area and may be impacted by the proposal, particularly through electrocution;
- determine whether bird strike from powerlines will be an issue for large birds in the study area and whether mitigation measures (eg use of coloured balls on the wire) to minimise this impact will be required.

4.2.3 Consideration

The EIS stated that the proposal could potentially result in the disturbance or loss of incremental amounts of remnant natural vegetation (including *Melaleuca biconvexa* and Sydney Coastal Estuary Swamp Forest Complex), particularly at the southern end of the study area. However, the EIS also stated that with careful and strategic selection of the exact placement of the pole sites and height of conductors above ground, the impact would either be non-existent or minimal. There is a certain degree of flexibility along most parts of the route alignment for this objective to be achieved.

NSW Fisheries has specified its requirements in relation to mangroves and aquatic flora and fauna (ie minimum distance for poles of 50 metres from creek banks; the method of

stringing conductors not to directly disturb significant vegetation, etc). The EIS committed compliance with these requirements, with the possible exception of two locations which are within the road reserve and existing transmission line easement. No impacts on riparian trees or mangroves are expected. A permit from NSW Fisheries would be obtained should it be necessary to lop or disturb mangroves on 'public water land' at any location.

In regards to potential habitat for transient or permanent use by threatened fauna species, the EIS considered that the impact of the proposal would be minimal.

The recommended measures in the EIS to minimise the impacts of the proposal on flora and fauna were derived from the proposed measures outlined in the Ecotone Report (section 5, Appendix D to the EIS) and also from the NSW Fisheries requirements. These measures, among others, involve avoidance of areas identified in the Ecotone Report as containing significant vegetation or fauna habitat, restrictions on removal or pruning of native vegetation, rehabilitation of vegetation, and inspection of rehabilitation works.

In response to the CCCEN's representation, EnergyAustralia advised that:

- recommendations for the conservation of the riparian wetland and rainforest remnants were made for each of the above identified locations in Ecotone's Flora and Fauna study. (Note that the proposed line does not cross Wingelo Creek);
- the Narara Creek crossings were among the areas thoroughly surveyed and assessed for the study. It was concluded that removal or lopping of riparian vegetation along various parts of Narara Creek could be avoided by strategic placement of the lines and poles and conductor height. There were specific recommendations to protect the mangroves along the southern section of Narara Creek;
- the coordinator of the Central Coast Riparian Rehabilitation Project will be consulted prior to any final line and pole placements to ensure that the line installation does not conflict with the works the group is undertaking or planning.

In response to the matters raised by the Department, EnergyAustralia's comments are summarised below:

- flora and fauna mitigation measures – it is intended to implement all recommended measures where feasible.
- Biconvex Paperbark issues – the 8-part test considered only the one location of these threatened species (the southern location along Railway Crescent between Sunnybank Road and Lisarow Station). It was concluded that the other location to the north would not be affected by the proposal as it lies on the opposite side of the railway line (eastern side) along which the powerline route is proposed. The exact alignment of the route, including pole locations, will not be known until detailed design.
- Grey-headed Flying Fox – this was officially listed as a vulnerable species under the Threatened Species Conservation Act 1995 after the flora and fauna study was prepared. There are no camps or colonies of Flying-foxes within or near the proposed powerline easement, the nearest colony being at Matcham. It is known that these species commonly traverse the entire area covered by the proposed powerline during migration and in search of food. However, the small numbers affected by the existing lines are expected to be insignificant in comparison with the typically tens of thousands making up the local population.

- Bird strike – the issue of bird strike with powerlines is only a significant problem for large birds where lines go through open areas. Few parts of the proposed route are in truly open areas. In forested or built-up areas, the number and range of obstacles that birds need to negotiate reduces their speed and hence their likelihood of colliding with conductors/powerlines. The installation of coloured balls is not considered to be particularly helpful in this situation.

The Department considers the above responses to be reasonable and acknowledges EnergyAustralia's intention to implement all recommended safeguards where feasible. However, in relation to the issue of birdstrike, it recommends a condition to monitor the incidence of this following the commissioning of the line (Condition of Approval No 36). The results are to be included in the environmental impact audit report to be submitted to the Department following the project's first year of operation.

To ensure protection of flora and fauna, the Department recommends the preparation of a detailed Flora and Fauna Management Sub Plan as part of the Construction EMP (Condition of Approval No 31). The Sub Plan is to address a range of issues involving mitigation measures for flora and fauna, rehabilitation and revegetation plans of disturbed/cleared areas, weed control procedures, and ongoing maintenance. Monitoring of rehabilitation measures is another recommended condition (Condition of Approval No 35).

4.3 ELECTRIC AND MAGNETIC FIELDS

4.3.1 Background

The issue of possible health risks associated with Electric and Magnetic Fields (EMFs) is the main potential concern during operation of the transmission line. The EIS provided an indicative profile for EMFs associated with the proposed transmission line. It also provided a summary of a detailed working paper on EMFs which formed part of the ROIP.

The magnetic fields for the proposed line are based on an annual average load, including an annual growth rate of 3% for the first 3 years followed by a growth rate of 2%. The voltage of the transmission line remains constant and so does the electric field.

The EIS concluded that the issue of possible health risks from everyday exposure to power frequency EMFs has not been established, and the risk to human health (if any) is likely to be small. However, the EIS stated that EnergyAustralia takes a cautious approach to the issues, and has applied a policy of 'prudent avoidance' in the selection of the route. In the case of this proposal, extensive community consultation and consideration of community concerns with EMF issues has led to the refinement of the proposed route. This involves positioning the line on the opposite side of the road, or at a distance of 25-30 metres, from existing dwellings and the skateboard ramp at Showground Road.

4.3.2 Key Issues

There were no concerns raised about electric and magnetic fields in the representation made to the exhibited EIS. However, the Department notes that EMF issues were one of the key considerations in the selection of the proposed route.

4.3.3 Consideration

The Department considers that EnergyAustralia has satisfied community concerns about this issue in view of lack of representations on this matter.

The Department notes that the NSW Health Department has recently considered the issue of magnetic fields. Health has advised that it is not currently appropriate to set a standard for community exposure to low level magnetic fields. Nonetheless, it noted that recent scientific reviews¹ agree that long term average exposure above a level of 4 mG is associated with a doubling in the risk of childhood leukaemia.

The proposed line may contribute to an overall increase in exposure to magnetic fields along the proposed route when combined with other power lines and home appliances. However, the EIS indicated that the proposal is expected to reduce the overall magnetic field exposure levels for some receptors. This is because an existing 33 kV powerline which goes through a higher residential density area and which produces similar magnetic fields will no longer be supplying West Gosford Substation.

As shown in *Figure 2*, the magnetic field level predicted to be generated by the proposal in 2013, at the closest receiver (25 metres from the line), will be no greater than the 4 mG level. The electric field, measured at the same location, is .01 kV/m (*Figure 3*).

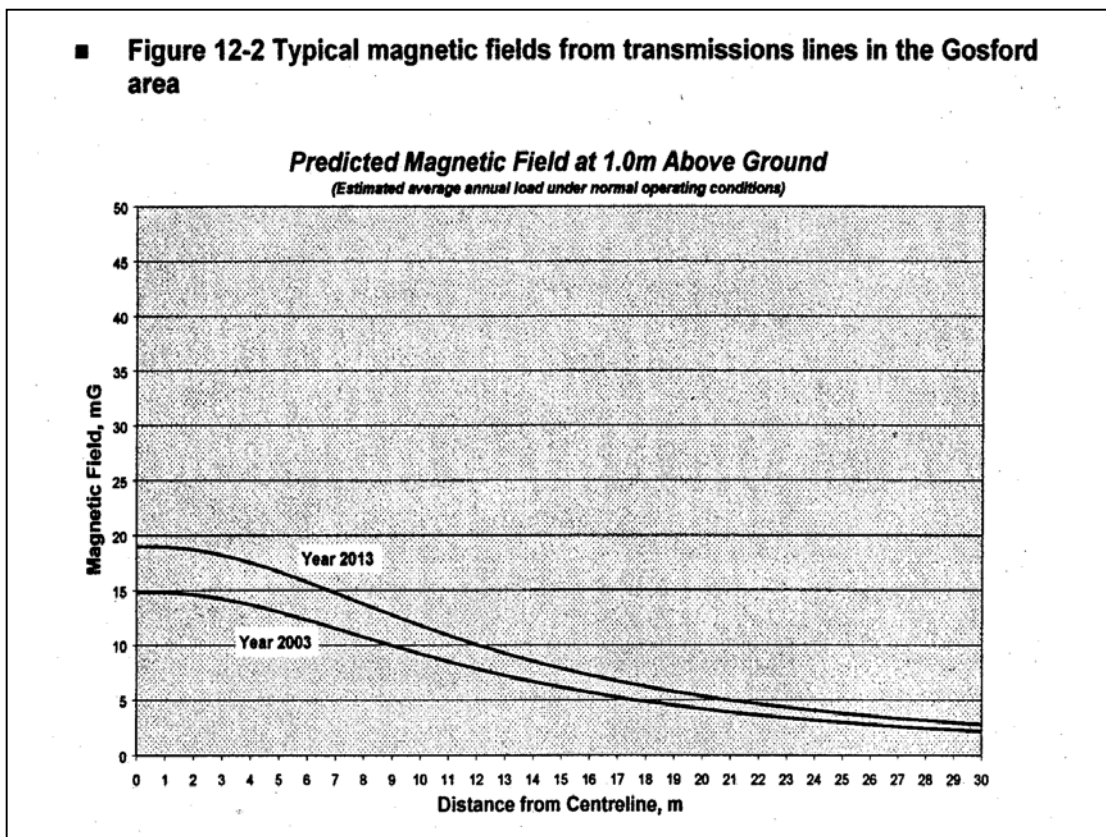


Figure 2: Typical magnetic fields from transmission lines in the Gosford area
(Source: Figure 12-2 of the EIS)

¹ This includes the 'Doll Report' (United Kingdom National Radiological Protection Board) and a recent report by the International Agency for Research on Cancer (IARC- a part of the World Health Organization).

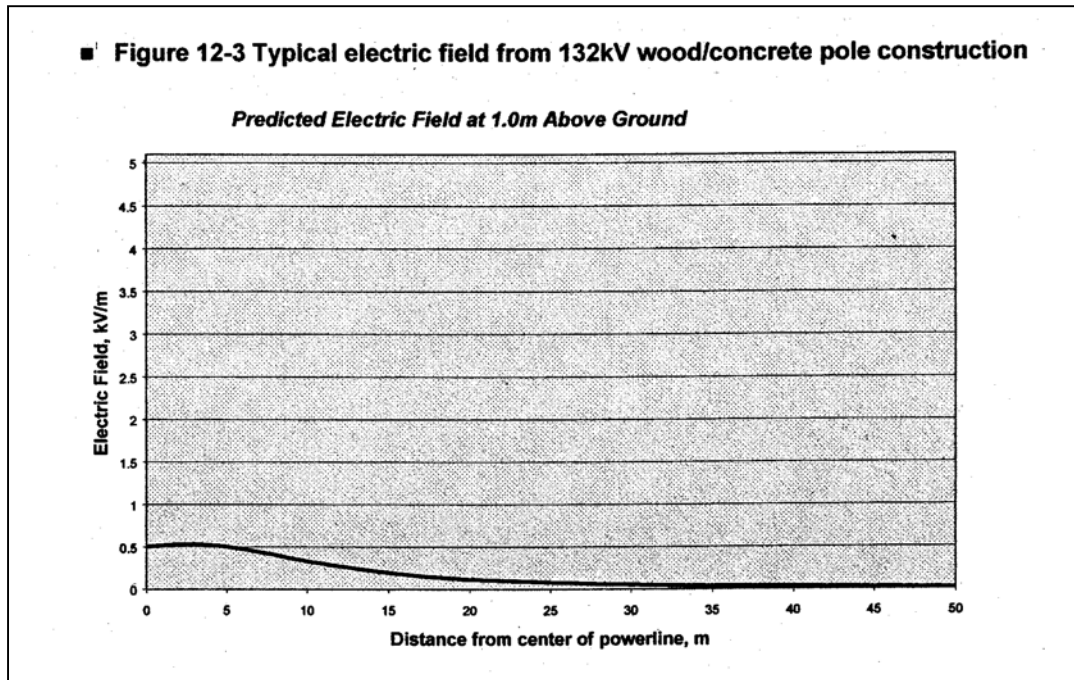


Figure 3: Typical electric field from 132kV wood/concrete pole construction
(Source: Figure 12- 3of the EIS)

The Department recognises that EnergyAustralia has exercised prudent avoidance in the location of the proposed line through its community consultation process and by maximising its distance from existing residences. However, it considers that it would be desirable for magnetic field levels to be monitored, to ensure the levels stay low. It is recommended that the Operation EMP be required to address this issue (Conditions of Approval Nos 26 and 27).

4.4 VISUAL IMPACT

4.4.1 Background

The EIS conducted a visual impact assessment of the proposal, which concluded that the proposal would have a low visual impact for the entire route. The assessment involved an evaluation of the visual modification that the proposed line would create within the landscape and the visual sensitivity of the environment through which it passes. A detailed discussion of the methodology used for this purpose is contained in the EIS.

The EIS identified the construction activities that could impact on the existing visual environment and more importantly, those sections of the route where the visual impact of the transmission line are expected to be highest. The greatest impact would occur on certain residential properties along Showground Road, Narara Valley Drive, Koninderie Parade and Pacific Highway. The EIS indicated some measures that would be employed to minimise the visual impact of the new line.

4.4.2 Key Issues

There were no representations received in relation to the visual impact of the proposed new line. In the identified locations which are within close proximity to residences, EnergyAustralia has endeavoured to reduce the visual impact of the proposed line by positioning the line on the opposite side of the roads from residential dwellings.

4.4.3 Consideration

Along many parts of the route near residences, 33 kV or 66 kV transmission lines already exist and therefore their replacement with a 132 kV line would only represent a marginal change in the visual environment and are not expected to result in any significant adverse impacts. Further, the Proponent's consultation with Gosford and Wyong Councils indicated that there are no specific critical viewing locations (eg lookouts) in the vicinity of the proposal that may be adversely affected. Viewing points are generally from a car or casual locations such as in the street or park/golf course.

To reduce the transmission line's visual impact along the route, the Proponent intends to implement measures such as maximising pole separation distances along the route; minimising pole height and diameter where possible; and vegetation screening of poles.

The Department considers that the visual impacts are acceptable. To ensure visual impacts are minimised, the Department recommends that the Proponent, as part of the Construction EMP, detail the visual impact mitigation measures to be implemented along the route (Condition of Approval No 43). This condition also requires the undertaking of specific measures, where practical, relating to colour and treatment of pole structures and vegetation screening of the line.

4.5 WATER QUALITY

4.5.1 Background

The EIS indicated that the proposed line may impact on surface water quality during construction. This may arise through soil disturbance, erosion and transportation of sediments to Narara Creek, or direct destabilisation of the creek bank at locations where the transmission line crosses the Creek channel. Spills from machinery and vehicles may also affect water quality.

To minimise the potential to affect water quality, the EIS stated that the poles would be located, where practicable, at least 40 metres from Narara Creek, Bangalow Creek and Ourimbah Creek. Where this is not practicable, a number of measures are recommended to prevent soil surface disturbance or sedimentation. Responses to spills and other emergencies causing water pollution are also addressed.

4.5.2 Key Issues

The proposed line would either cross creeks (3 crossings at Narara Creek, also at Bangalow and Ourimbah Creeks) or be located in the vicinity of these waterbodies. The main issue with water crossings is the potential adverse impact on surface water quality at these creeks.

4.5.3 Consideration

Due to the span length between poles (60-120 metres), the EIS stated that the need for excavation for pole footings within 40 metres of the banks of Narara Creek can be largely avoided. A possible exception to this is where the alignment follows Showground Road and Manns Road at Narara. However, the creek in these built-up areas has been highly disturbed by urban development. In addition, as the proposal is within the road reserve through this section, the extent of works required to build the access tracks would be minimal.

The poles at other creeks (including Bangalow Creek at the northern end of the proposed route) are mostly able to be located at least 40 metres away from creek banks. According to the EIS, this is sufficient distance to prevent sediment transport to these waterways as a result of construction activities. There may be a need to erect new poles in the existing transmission easement south of Bill Sohler Park, in the vicinity of Bangalow Creek. However, the extent of soil disturbance would be minimal. There would also be no need to construct new access tracks in this location as the route follows an existing transmission line.

The stringing process for erecting conductors described in the EIS would avoid the need for machinery operation at or near the banks of creeks. The NSW Fisheries document *Policy and Guidelines for Bridges, Roads, Causeways, Culverts and Similar Structures* would be referred to for guidance.

The Department considers that the potential for impacts to water quality and bank stability would be minimal provided the proposed measures in the EIS are implemented. To ensure prevention of any adverse impacts during construction, the Department recommends the preparation of a Soil and Water Management Plan, which shall incorporate a detailed Erosion and Sedimentation Control Plan (Conditions of Approval Nos 53 and 54).

4.6 NOISE AND VIBRATION

4.6.1 Background

No readings of existing background or individual noise levels have been conducted as part of the EIS. The EIS stated that construction noise levels are not expected to create significant impacts on the surrounding population. Vibration impacts could arise from drilling, boring or excavation activities and vehicle movements. However, due to the nature of soils, the extent of excavation works and the distance from sensitive receptors (houses and schools), noticeable vibration impacts are unlikely.

During operation of the line, noise may be generated intermittently but is unlikely to be discernible above background levels. Various sounds that could be emitted by transmission lines are discussed in the EIS.

EnergyAustralia commits to include in its Construction EMP noise mitigation measures to limit noise levels in accordance with the EPA's Environmental Noise Control Manual (ENCM). It does not consider it necessary to implement any mitigation measures to reduce the impacts of operational noise.

4.6.2 Key Issues

The EIS did not propose any monitoring of noise generation during construction. EnergyAustralia advised that this was on account of the transitory nature of the proposed works (eg it takes only several hours to excavate and erect poles at any given site, and that no significant noise is expected from the stringing activities) and also because of its intention to ensure that the construction noise objectives in the ENCM are complied with.

4.6.3 Consideration

During construction works, the distance of the proposed line from sensitive receptors (closest is 25 metres) and the relatively short duration of construction works at any one point would diminish the significance of noise impacts.

To ensure minimal noise impacts during the construction period, the Department recommends that the Proponent, as part of the Construction EMP, prepare a Noise and Vibration Management Plan (Condition of Approval No 47). In addition, it recommends that construction noise levels be monitored where complaints are received, and that construction hours be restricted in accordance with Conditions of Approval Nos 48 and 51.

During the operation of the line, certain sounds (eg *corona*, a 'fizzing' sound under wet weather conditions; and *aeolian noise*, when wind blows over conductors and insulators) could potentially occur. Based on previous studies by the former Electricity Commission of NSW of noise generation from high voltage transmission lines (500kV and 300kV), a noise level of 35 dB(A) was measured at ground level at the centre of a 300kV transmission line easement. Extrapolating this result for the proposed 132kV line, the EIS considered that under normal and wet weather/humid operating conditions, levels produced from the proposed line are likely to be less than the noise level from the higher voltage line. Impacts from this level of noise would be diminished through location of the line distant from sensitive receptors and through impacts from traffic and train noise along the proposed route. The EIS concluded that operational noise from the transmission line would not be easily discernible from the background noise levels experienced for the majority of the time within the vicinity of the route.

The Department agrees with the Proponent that no mitigation measures are considered necessary to reduce the impacts of operational noise.

4.7 SOILS, GEOLOGY AND CONTAMINATION

4.7.1 Background

The majority of the 11 km line route requires new poles, with the exception of the northern section from the proposed rail line crossing at Teralba Street, and potentially sections linking Gosford STS and West Gosford Substation.

The EIS indicated that the soils of the proposed route are predominantly alluvial (of the Wyong and Yarralong types) and they have relatively low erodability characteristics. However, stream bank stability remains an issue. Additionally, the soils are identified as presenting a foundation hazard due to waterlogging and movement.

It was also indicated that sections of the route where new poles are required correspond with areas of high potential for Acid Sulphate Soils (ASS), specifically along Dwyer Road, Perina Road, Glennie Street West, Showground Road and Manns Road. Potential ASS in these locations are located at, or near, ground level to a depth of up to 3 metres. The required depth of pole footings is approximately 3 metres.

Land contamination from substances leaking from transformers is a potential issue with electricity substations and sub-transmission stations. EnergyAustralia advises that there are no contamination orders or notices associated with the substations involved in the proposal. The potential for contamination in other areas along the route is minimal, according to the EIS.

4.7.2 Key Issues

The main issues identified in the EIS relate to:

- erosion hazard from pole footing excavation;
- potential disturbance of ASS;
- potential disturbance of known contaminated land or the introduction of new contaminated material or contaminants to the site area.

4.7.3 Consideration

Soils and land capability

The EIS claims that soil erosion from excavation works can be adequately managed because of the relatively small size of the excavations, the short duration of exposure, and the flat topography. Poles would also be located away from stream banks. The design of footings and foundation material would be addressed during detailed design to ensure pole stability and resistance to soil dynamics over time.

The identified highest risk locations for ASS are in the southern sections of the route, near Narara Creek. Areas of high probability occur at:

- Narara Creek crossings (2 locations) south of Gosford STS;
- Gosford Golf Course and Gosford Showground, including parts of Dwyer Street, Perina Road and Glennie Street West along the proposed route;
- Narara Creek crossing on Showground Road;
- Narara Creek crossing on Manns Road.

The Department notes that detailed investigations of actual acid sulphate soils or existence of potential acid producing (pyritic) material have not been undertaken as the final location of poles has not been determined. However, it expects the soil disturbance from excavation works to be relatively minor and considers that the risk of ASS can be properly managed with the measures recommended in the EIS. These measures include:

- conducting soil sampling at and around pole locations prior to excavation;
- relocation of poles to avoid acid producing soils, where necessary and practicable;
- where relocation is not practical, preparation of a Soil and Water Management Plan, approved by DLWC, addressing specific measures prior to excavation.

As recommended in Section 4.5, the Proponent is required to prepare a Soil and Water Management Sub Plan (incorporating erosion and sedimentation control requirements), as part of the Construction EMP. The Plan requires the implementation of erosion and sedimentation measures for all areas that are considered at risk.

The Department also recommends the preparation of a detailed Acid Sulphate Soil Management Sub Plan, as part of the Construction EMP. The Sub Plan is required to assess the potential impacts of ASS and to address how the impacts would be minimised and managed effectively (including contingency situations). The Department is satisfied that this issue is manageable providing effective controls are in place.

Land Contamination

The EIS stated that the proposal avoids direct impact on known contaminated sites (eg former sewage treatment works at Perina Road), but passes nearby to these sites. It stated that pole positioning would be avoided, to the greatest extent practicable, in areas where contaminants may have leached into or otherwise been transported from contaminated sites to adjacent land.

While construction activities could introduce contaminants (generally petroleum products – oil, diesel, etc), proper and safe handling of these materials would avoid the potential for land contamination. Where poles are required to be sited on potentially contaminated land, the EIS recommended the following measures:

- procedures for managing contaminated or potentially contaminated material identified during construction;
- emergency response procedures to deal with accidental spills from construction works, including notification/reporting, containment and clean-up requirements;
- procedures for obtaining WorkCover approvals where necessary for works at substations.

The Department notes that excavation and removal of contaminated material is generally not necessary to carry out the proposed works. Should there be any disturbance of contaminated material, it is likely to present an insignificant risk to the environment and human health due to the small areas of land proposed to be disturbed, and the historic use of land along the proposed route. However, to ensure that any potential contamination problems are mitigated, the Department recommends the inclusion of conditions that define the procedures for soil investigations prior to excavation works and actions required to deal with contaminated land, including disposal requirements off site (Condition of Approval No 57).

4.8 HERITAGE

4.8.1 Background

Heritage Consultants, Robynne Mills Archaeological and Heritage Services, prepared a heritage study and assessment of the proposal as part of the EIS (Appendix E of the EIS).

No heritage items along or in the vicinity of the proposed route are listed in State or National Heritage Registers. However, five non-indigenous heritage items immediately adjacent to the proposed route are listed on Wyong Council's LEP Heritage Schedule, these being:

- Ourimbah Sawmill;
- Ourimbah Railway Station;
- Lisarow Cemetery;
- Lisarow Post Office and Store;
- Holcombe House.

Also identified were a number of non-indigenous items not currently included on heritage lists, including:

- Utility Structure, Brush Road, Ourimbah;
- Bill Sohler Park, Ourimbah.

Indigenous heritage items were identified from existing records and ground surveys in association with the Local Aboriginal Land Council (LALC). Potential sites identified are as follows:

- midden site near the western bank of Narara Creek, near Dell Road (NC-M-1). The Darkinjung LALC considers the site to be an important part of Aboriginal Heritage as there are very few remaining midden sites on the Central Coast;
- creek banks and adjacent raised terraces (high sensitivity rating);
- narrow ridgeline separating the catchments of Narara and Bangalow Creeks (moderate sensitivity).

4.8.2 Key Issues

With both indigenous and non-indigenous heritage items, the EIS stated that the proposal would not have any direct impact on them. However, the heritage study considers that indigenous heritage sites not currently known, particularly in high sensitivity locations near creeks and creek terraces, may be impacted by the proposal.

4.8.3 Consideration

In respect of non-indigenous heritage items, the proposal passes through Bill Sohler Park. However, the impact on the park would be minimal as in this location, the proposal would only replace an existing transmission line.

The indigenous site NC-M-1 is approximately 16 metres from the proposed alignment and would not be directly impacted by the proposed line.

The Department considers that the location of poles should be determined only after more detailed assessment to determine the exact location of any sites in areas of high sensitivity. It supports the proposed mitigation measures in the EIS relating to both design and construction aspects of the proposal, which includes:

- identification of proposed pole locations that are within areas identified in Section 6.2 of the Heritage and Archaeological Assessment Report (Appendix E of the EIS);
- inspection of the location of these poles by a qualified archaeologist and representative of the LALC to determine presence of sites of significance;

- where poles are located in areas of significance, relocation of poles where practicable to less sensitive locations. Where relocation is not possible, monitoring or sieving of excavated material to determine significance and retain records;
- locate the alignment on the opposite side of the road to Lisarow cemetery;
- specific restrictions on the entry of vehicles, storage of equipment, etc in the area of the site near NC-M-1 near Narara Creek;
- preparation of a management plan in consultation with the Darkinjung LALC to ensure impacts on the site are minimised;
- presence of a representative of the Darkinjung LALC during construction works in this area to monitor works and impacts on the midden site;
- should any unrecorded indigenous or non-indigenous material be found during construction, work would cease and an archaeologist and the LALC (where relevant) would be contacted to undertake a site inspection.

The Department notes that EnergyAustralia will generally avoid undertaking works in the vicinity of creeks. This should reduce the likelihood of disturbance to Indigenous sites.

To reinforce the implementation of the proposed measures, the Department recommends the imposition of the following conditions (Conditions of Approval Nos 40 to 42):

- preparation of an Indigenous Heritage Management Sub Plan, as part of the Construction EMP, including a requirement to cease work immediately and to contact the NPWS and the relevant LALC to determine appropriate course of action;
- the Proponent to invite a representative of the Darkinjung LALC to be present on site during clearing and initial construction in those potentially sensitive locations identified above;
- ceasing of work if previously unknown or unassessed sites of potential non-indigenous heritage are disturbed during construction, notification of NSW Heritage Office, and site assessment by a qualified archaeologist.

5 ASSESSMENT OF OTHER ISSUES

This section outlines the Department's consideration of issues (other than those discussed in the previous section) relating to the current proposal. Again, recommendations are made for conditions of approval, where appropriate, in order for particular issues to be satisfactorily addressed during construction and/or operation.

5.1 AIR QUALITY

5.1.1 Background

Existing air quality is unknown as no local air quality monitoring has been undertaken by either Gosford City Council or Wyong Shire Council. Gosford Council suggests that air pollution from Newcastle and Sydney has an impact on local air quality.

Potential air quality impacts during construction are limited to dust generation and emissions from engines arising from the operation of machinery and trucks. Impacts will depend on local meteorology and management and operational maintenance of vehicles and machinery.

Operational impacts on air quality are limited to indirect impacts associated with electricity generation and consumption. The EIS also considers them to be neutral in that while the proposal would facilitate consumption of electricity from greenhouse emitting generation sources (eg coal fired power stations), it also provides the opportunity for access to electricity from renewable and non-polluting sources to be provided in the future.

5.1.2 Key Issues and Consideration

Dust emissions may be generated, particularly during windy conditions, from small excavations for the erection of new poles and storage of excavated material at the work site. However, as excavations would involve disturbance of a very small area of soil, with minimal storage of excavated material, the potential for dust generation is expected to be insignificant.

Most machinery (including trucks, excavation equipment and cranes) would be operating on diesel engines and emissions from engines could contribute to reduced local air quality. Greenhouse gas emissions would also result from vehicles and machinery used. Provided such vehicles and machinery are properly maintained and operated, emissions from these sources are expected to contribute negligible amounts to local air pollution and greenhouse gases.

The Department supports the recommended measures in the EIS to minimise impact on local air quality. These include dust suppression mechanisms (eg watering or screens) in windy conditions; proper maintenance of all vehicles and machinery; and revegetation/stabilisation of disturbed areas. Provided these measures are implemented, the Department considers that impacts of the proposal during construction would be minimal.

The Department recommends that a Construction Stage Air Quality Sub Plan be prepared, as part of the Construction EMP. The Sub Plan is to promote the reduction of greenhouse gases by adopting energy efficient work practices and to detail all dust control measures to be implemented during construction (Condition of Approval No 44). A condition requiring maintenance of all construction vehicles and covering of loads (as appropriate) is also recommended (Condition of Approval No 45).

Issues relating to increased electricity use are discussed in section 4.1

5.2 TRAFFIC AND ACCESS

5.2.1 Background

The EIS did not provide any information on traffic generation likely to result from the proposal during the construction phase. In response to the Department's request for this information, EnergyAustralia provided indicative figures of traffic generation that would occur during the construction phase as shown in the table below.

Figure 4: Estimated traffic generation during construction

Construction sections	Estimated number of vehicle movements						Total construction time
	Centreline marking	Easement clearing	Pole delivery	Pole erection	Conductor stringing	Additional light vehicles	
Section 1	80	10	18	165	165	80	2 months
Section 2	90	10	16	190	190	90	2 months
Section 3	30	50	7	70	70	30	2 months
Section 4	100	10	18	210	210	100	2 months
Section 5	30	15	6	70	70	30	2 months
Section 6	20	5	4	45	45	20	2 months
Section 7	15	0	3	50	20	15	2 months

Construction of the line will be undertaken in seven sections as described in Section 2.2.2.

RTA traffic data for main roads along the route in terms of annual average daily traffic movements (AADT 1998) are: Pacific Highway – 24,917; Narara Valley Drive – 13,158; Manns Road – 15,870; Showground Road – 5,762. There is no available data for Railway Crescent - Gosford Council's estimate is 8000 vehicle movements.

5.2.2 Key Issues and Consideration

Traffic generation will result from easement preparation, tree pruning, pole removal/delivery, stringing conductors and earthwires, and construction plant movements. Construction of each section will take approximately 2 months with each stage of the line construction process being done sequentially.

The amount of traffic generation from the project at each section of the route is considered minimal. For example, in Section 4 where the number of vehicle movements are expected to be the highest, the average daily vehicle movements would be about twelve, although no indication was given of peak daily movements.

Nonetheless, the total vehicle movements would be very small in comparison to the number of vehicles using these roads. The main potential impact of the project is likely to be along Pacific Highway (between Teralba and Dora Streets).

EnergyAustralia advised that construction traffic management will be undertaken in accordance with RTA guidelines.

The Department considers that the impact of the construction activities on traffic can be properly managed through the preparation of a Construction Traffic Management Sub Plan prepared, in consultation with the RTA and relevant Councils. It also considers that construction traffic would not significantly affect local road capacity or safety provided that such movements are adequately controlled by such a plan.

Accordingly, the Department recommends that EnergyAustralia prepare, as part of the Construction EMP, a Construction Traffic Management Sub Plan, in consultation with the RTA and relevant Councils (Condition of Approval No 37). The Sub Plan must outline the key safety and traffic control measures that will be applied to minimise disruption and ensure public safety and adequate access.

Given that the precise location of the poles will not be known until the detailed design stage, the Department considers that the detailed requirements could be provided through a Traffic Control Plan for each specific site or section, prior to commencement of construction at each site/section (Condition of Approval No 37). This plan must be consistent with the Traffic Management Sub Plan and is to detail a range of matters including construction traffic types, volumes and routes, traffic safety requirements, management of access to properties and actions to be taken where partial or total road closures/detours are required.

Additional recommended conditions require: preparation of a road dilapidation report for all non-arterial roads likely to be used for the project (Condition of Approval No 38) with the Proponent being responsible for rectifying damage caused; and the Proponent being responsible for advising local residents and businesses on disruption to services (Condition of Approval No 39).

5.3 HYDROLOGY AND FLOODING

The wide floodplain area of Lower Narara Creek affects the proposed development between West Gosford Zone substation and Gosford STS. The Gosford Racecourse, Gosford Golf Course and West Gosford Industrial Area are located in flood storage areas.

The EIS stated that the construction of overhead 132kV lines would have negligible impact on the local drainage patterns or flood regime because they would not form significant obstacles to flood flows or affect the heights of floodwaters.

While the Department accepts this view, it considers it important that management measures are put in place to ensure that the risks of flooding are minimised. The Department recommends that the Construction and Operation EMPs address hydrological and flooding issues.

5.4 LAND TENURE AND USE IMPACTS

5.4.1 Background

Requirements for easements in some sections of the proposed route, degree of exposure to electric and magnetic fields, physical presence of poles and conductors and restrictions on existing infrastructure facilities/services were identified in the EIS as creating potential impacts on land uses along the proposed route.

5.4.2 Key Issues and Consideration

The main issues associated with land tenure and uses are:

- Easement requirement - while the location of the proposed line will largely be within existing easements or within road reserves, easements will be required in some sections. However, their exact location will not be known until the detailed survey (centreline survey) of the line has been carried out.

The EIS indicated that EnergyAustralia's management of encroachments onto areas other than public roads is generally through easement acquisitions. At this stage, there is no evidence that easements will be required over private property.

EnergyAustralia proposes to identify on property titles restrictions on uses within easements.

- Exposure to electric and magnetic fields - the sensitivity of land uses is largely related to the degree to which people are exposed to these fields.

The route selection process entailed the use of 'prudent avoidance' principles. It identified various properties (residential, open space/recreational facilities) which, because of their proximity to the proposed route, are considered potential sensitive receptors. The preferred route was then developed with members of the Community Working Group to maximise distances between the transmission line and these sensitive receptors. The Department considers that this would sufficiently reduce the potential for human health impact based on the current use of the land. (see also section 4.3 on EMFs).

- Limitations to current use of land – the location of the proposal raises the issue of potential conflicts with certain infrastructure facilities/works, ie future road works by the RTA within the section of the Pacific Highway between Dora Street and Teralba Road at Lisarow; Gosford to Wyong trunk water supply main (which follows a route similar to that proposed for the transmission line) and sewer and stormwater infrastructure in the area. The proposal may also impact on street tree planting, landscaping within public reserves, or on new development proposals.

The Department acknowledges the importance of avoiding conflicts with infrastructure facilities and works. To ensure that impacts are minimal, it recommends the inclusion of Conditions of Approval Nos 61 to 64. These conditions require:

- the identification, through consultation with relevant authorities, of the exact location of all infrastructure facilities/services that may be within or near the proposed alignment;
- maintaining appropriate clearances from all existing buildings/structures to ensure that poles are located so as not to impact on these facilities/services;

- the Proponent to ensure that there are no known development proposals within the vicinity of the proposal that would be potentially restricted by the need to maintain clearances to overhead electricity transmission lines; and
- development of a contingency plan to deal with accidental damage and repair of facilities/services.

5.5 PROPERTY EFFECTS

5.5.1 Background

The impact of the proposal on property values at both the regional and local level was addressed in the EIS. The EIS stated that it is not possible to quantify the overall net property effect in the Central Coast area. Even with improved quality of electricity supply anticipated from the proposal, the overall net impact is expected to be neutral. Security of electricity supply is an explicit expectation that residential and commercial investors hold when choosing to buy in any area.

At the local level, the EIS likewise was unable to quantify the impact on property values for any particular residence or street as a result of the project. The common perception is that transmission lines either reduce the value of property significantly or even make it unsaleable. The EIS claims that there is evidence in the market place that land in the vicinity of transmission lines continues to be developed and sold in urban areas and productivity continues undiminished in rural areas.

5.5.2 Key Issues and Consideration

The Department acknowledges the difficulty of quantifying accurately the net impact of the project, particularly at the local level. It agrees that there are various factors affecting the assessment process, including the design, visual impact, number of people affected, regional issues, concerns over EMF, restriction of activities, and the perception of buyers and vendors. It considers that EnergyAustralia has undertaken extensive community consultation in the selection of the proposed route. Where feasible, the selection process has maximised the distance of the proposed line in existing residential areas in accordance with established principles of prudent avoidance. The Department also notes that the local community did not raise objections to the proposal as put forward in the EIS. It therefore concludes that the community's perception is that it is unlikely their property values will be adversely affected.

5.6 IMPACTS ON THE COMMUNITY

The EIS stated that the proposal would not result in restriction to property access but could cause minor, relatively short-term interruptions during construction. EnergyAustralia or its contractors would consult directly with affected property owners and users to minimise impact of any access changes. Full access to land and properties would be restored to current levels following construction.

The EIS also stated that no adverse impacts on community use of land is expected. This is in view of the proposed route being in either road reservations (including land currently used for electricity transmission) or rail corridors which are currently restricted for public safety.

An identified potential impact from transmission lines is radio and television interference due to corona discharges on the surface of insulators or bad contacts. Measures required to minimise radio and television interference are the same as for the reduction of audible noise, eg selection of conductor size to minimise the potential for corona noise. The EIS notes that exposure of the conductors to the climatic elements generally reduces noise levels over time.

“Passive interference” may also be caused by a transmission line by reflecting and re-radiating broadcast signals, as can all large structures (eg buildings). This would be minimised by avoiding the use of steel tower construction and using concrete pole construction. EnergyAustralia advised that it would be using concrete poles (and possibly some wood poles) for the length of the line.

5.7 HAZARDS, RISKS AND PUBLIC SAFETY

The EIS did not specifically address hazards and public safety issues during the construction and operation of the transmission line. For example, there was no discussion on potential for public harm that may result from construction activities, or how the transmission line will be secured following construction to minimise the potential for crime in the vicinity of the line (eg vandalism, loitering, illegal dumping, etc).

The Department considers that the proposed transmission line represents a minimal risk impact on surrounding land uses during its construction and operation. Construction activities are considered to pose little more than an incidental public safety issue associated with construction sites.

As a precautionary measure, the Department recommends the preparation of a Construction Safety Sub Plan to manage hazardous incidents and public safety during the construction period (Condition of Approval No 65). It also recommends the preparation and implementation of an Emergency Sub Plan to manage emergency events that may arise during the operation of the line (Condition of Approval No 66). In addition, the preparation of a Security and Crime Management Strategy is also recommended to prevent any unauthorised access to relevant components of the transmission line, and to minimise the potential for crime in the vicinity of the line (Condition of Approval No 67).

5.8 WASTE MANAGEMENT AND REUSE

Waste generation during easement clearing and construction works is expected to be minimal. Waste material will result from tree or vegetation pruning, excavation of soil, offcuts of so called ‘line hardware’ (insulators, braces, bolts, underground cables, etc) and removal of existing poles and crossarms (in areas where existing lines are to be reconstructed). Generation of waste during maintenance and operation of the line is likewise expected to be minimal.

EnergyAustralia advised that vegetation and tree branches are mulched on the construction sites for placement in vegetation zones while larger logs, old power poles, hardware offcuts, etc are disposed of in approved waste disposal facilities.

To ensure proper management and disposal of waste material both during the construction and operation phases of the transmission line, the Department recommends the preparation of a detailed Waste Management and Reuse Sub Plan (Conditions of Approval Nos 58 to 60). The Sub Plan is to identify requirements for a range of matters, including handling and disposal of wastes and reuse and recycling.

5.9 CUMULATIVE IMPACT

The EIS identified and assessed the cumulative impacts of the proposal in terms of greenhouse gas emissions, visual amenity, electric and magnetic fields and erosion and sedimentation. It concluded that the cumulative impact is expected to be negligible, as outlined below:

- the proposal does not in itself cause greenhouse emissions during operations as it is a conduit for power transfer from both polluting and non-polluting sources. Greenhouse emissions would occur from machinery and vehicles used during construction. However, this would be relatively insignificant in the overall context of greenhouse emissions from vehicle and machinery from the Central Coast area.
- the proposal would have a low visual impact for the entire route. On sections of the route passing parallel to the rail line, the proposal would contribute only minimally to visual clutter.
- the proposed line may contribute to an overall increase in exposure to magnetic fields along the proposed route when combined with other power lines and home appliances. However, the proposal is expected to reduce the overall magnetic field exposure levels for some receptors. This is because an existing 33 kV powerline which goes through a higher residential density area and which produces similar magnetic fields will no longer be supplying West Gosford Substation.
- relative to other activities in the same water catchment areas, the proposal would result in disturbance of soil in only very small areas and for a short duration. Mitigation measures would further reduce the likelihood of erosion and subsequent sedimentation of waterways and other land.

The Department considers the above conclusions to be a reasonable assessment of cumulative impact issues. Other impacts such as traffic effects are unlikely to add much to current impacts in the region.

6 CONCLUSIONS AND RECOMMENDATIONS

The proposal is likely to increase the security and reliability of electricity supply to the Central Coast area. EnergyAustralia has considered the issue of environmental impact of the proposal at different stages of its development including during options consideration, route selection phase and consideration of environmental management measures.

Construction will have a number of minor, temporary local impacts including noise, traffic and community impacts. With appropriate management, these impacts are controllable to acceptable levels. These impacts also need to be seen in the context of the identified advantages of the new line.

No significant impacts are expected at the operational stage.

On the basis of the assessment conducted for the EIS, the representation received, supplementary information obtained from the Proponent, and the findings of this assessment report, it is concluded that the environmental impacts associated with the proposal could be managed to an acceptable level.

It is recommended that the proposal be approved by the Minister for Planning subject to the recommended conditions of approval specified in Section 7 of the Director-General's assessment report. These conditions relate to:

- community notification and liaison during construction, including procedures to manage and resolve complaints;
- preparation of construction and operation EMPs covering issues such as:
 - demand management
 - flora and fauna;
 - noise and vibration,
 - air quality;
 - soil and water management;
 - acid sulphate soils management;
 - traffic management;
 - heritage management
 - waste management and reuse;
 - construction safety;
 - management of emergency events
- specific conditions addressing heritage/archaeology, visual impact, and utilities and services;
- environmental monitoring and reporting requirements; and
- independent auditing.

7 RECOMMENDED CONDITIONS OF APPROVAL

This section provides the Department's recommended conditions of approval for the project under Section 115B(2) of the EP&A Act. These are based on the Department's assessment of the EIS, the representation made to EnergyAustralia and advice provided.

It is noted that the EIS contains information on procedures and mitigation strategies to be implemented to ameliorate impacts of the proposal. The recommended conditions should therefore be implemented in conjunction with those procedures and mitigation strategies specified in the EIS. Where there is an inconsistency with the recommendations in the EIS, the recommendations in these conditions would prevail.

The following acronyms and abbreviations are used in this section:

ASS	Acid Sulphate Soils
CWG	Community Working Group
dB(A)	Decibel (A-weighted scale)
Department, the	Department of Planning
Director-General, The	Director-General of the Department of Planning (or delegate)
Director-General's Report	The report of the Director-General of the Department of Planning, prepared under section 115C of the EP&A Act
DLWC	Department of Land and Water Conservation
EIS	'Gosford to Ourimbah Electricity Supply Upgrade' Environmental Impact Statement prepared for EnergyAustralia by Sinclair Knight Merz and dated June 2001.
EMP	Environmental Management Plan
EMR	Environmental Management Representative
ENCM	Environmental Control Noise Manual
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	Environment Protection Authority
kV	kilovolts
LALC	Local Aboriginal Land Council
L ₁₀	The noise level, which is exceeded for 10 percent of the time and is approximately the average of maximum noise levels.
Minister, The	Minister for Planning
NPWS	National Parks and Wildlife Service
Proponent	EnergyAustralia
Relevant Councils	Gosford City Council, Wyong Shire Council
Representations Report	'Gosford to Ourimbah Electricity Supply Upgrade'

	<i>Representations Report</i> prepared by EnergyAustralia and dated October 2001
RIC	Rail Infrastructure Corporation
RTA	Roads and Traffic Authority

General

1. The proposal shall be carried out in accordance with:
 - the proposal contained in the environmental impact statement (EIS) '*Gosford to Ourimbah Electricity Supply Upgrade*' prepared for EnergyAustralia by Sinclair Knight Merz dated June 2001, and the Representations Report prepared by EnergyAustralia dated October 2001;
 - all identified plans, safeguards and mitigation measures presented in the EIS and Representations Report;
 - the conditions of approval granted by the Minister.
2. Despite the above, in the event of any inconsistency with the proposal as described in the EIS and the Representations Report, the conditions of approval granted by the Minister shall prevail.
3. **It shall be the ultimate responsibility of EnergyAustralia to ensure compliance with the conditions of this approval.**
4. **These conditions do not relieve the Proponent of the obligation to obtain all other approvals and licences from all relevant authorities required under any other Act. Without affecting the generality of the foregoing, the Proponent shall comply with the terms and conditions of such approvals and licences.**

Compliance

General

5. The Proponent shall comply with, or ensure compliance with, all reasonable requirements of the Director-General in respect of the implementation of any measures arising from the conditions of this approval. The Proponent shall bring to the attention of the Director-General any matter that may require further investigation and the issuing of instructions from the Director-General. The Proponent shall implement these instructions to the satisfaction of the Director-General within such time that the Director-General may specify.

Pre-Construction Compliance Report

6. At least two weeks prior to commencement of substantial construction (or within such period as otherwise agreed by the Director-General), the Proponent shall submit for approval of the Director-General a compliance report detailing compliance with all relevant conditions that apply prior to commencement of substantial construction and shall address:
 - the dates of submissions of the various studies and/or requirements of various relevant conditions, and their approval and terms of approval; and
 - action taken or proposed to implement the recommendations made in terms

of approvals and/or studies.

Pre-Operation Compliance Report

7. At least one month prior to commencement of operation (or within such period as otherwise agreed by the Director-General), the Proponent shall submit for approval of the Director-General a compliance report detailing compliance with all relevant conditions that apply prior to commencement of operation and shall address:
 - the dates of submission of the various studies and/or requirements of various relevant conditions, and their approval and terms of approval; and
 - action taken or proposed to implement the recommendations made in terms of approvals and/or studies.

Dispute Resolution

8. The Proponent shall endeavour, as far as possible, to resolve any dispute with relevant public authorities arising out of the implementation of the conditions of this approval. Should this not be possible, the matter shall be referred firstly to the Director-General and if the matter cannot be resolved, then to the Minister for resolution. The Minister's determination of the disagreement shall be final and binding on all parties.

Project Commencement

9. The Proponent shall notify the Director-General and all relevant authorities in writing of the project commencement, both in terms of construction and operation.

Contact Telephone Number

10. Prior to the commencement of construction, the Proponent shall institute, publicise and list with a telephone company a 24 hour complaints contact telephone number, which would enable any member of the general public to reach a person who can arrange appropriate response action to the complaint.

Complaints Register

11. The Proponent shall record details of all complaints received during construction and ensure an initial response to the complaint is provided within 24 hours, and a detailed response within 10 days. Information on all complaints received shall be made available on request to the Director-General and all relevant Councils and government agencies. The Proponent shall nominate an appropriate person(s) to receive, log, track and respond to complaints within the specified timeframe. The name and contact details of this person(s) shall be provided to the relevant Councils and the Director-General upon appointment or upon changes to that appointment.

Advertisement of Activities

12. Prior to the commencement of construction, the Proponent shall undertake consultation with all relevant Councils and the Community Working Group, as specified in Condition 15, to develop appropriate notification requirements and signage. As a minimum, the Proponent shall, prior to the commencement of

construction, and then at three-monthly intervals, advertise in relevant local newspapers the nature of the works proposed for the forthcoming three months, the areas in which these works are proposed to occur, the hours of operation and a contact telephone number.

13. The Proponent shall ensure that the local community is kept informed (by way of local newsletters, leaflets, newspaper advertisements, and community noticeboards, etc.) of the progress of the project, including any traffic disruptions and controls, construction of temporary detours and work required outside the nominated working hours, prior to such works being undertaken.
14. The Proponent shall establish a project Internet web site prior to the commencement of construction and maintain the Internet web site until 12 months after commencement of operation of the project. This Internet web site shall contain monthly updates of work progress and consultation activities, including but not limited to:
 - (a) a description of relevant approval authorities and their areas of responsibility;
 - (b) a list of environmental management plans and reports that are publicly available and the executive summaries of those reports;
 - (c) minutes of local community working group meetings; annual reports and other public reports required by this approval, and results and interpretation of monitoring required by this approval;
 - (d) links to all newsletters;
 - (e) contact names and phone numbers of the project communications staff; and
 - (f) 24 hour toll-free complaints contact telephone number.

The Internet address is to be made publicly available.

15. The existing Community Working Group shall be maintained for the construction period, unless otherwise agreed by the Director-General, to discuss detailed design issues and methods for minimising the impact on the local community and businesses during the construction stage. The Proponent shall ensure that the Group includes the Environmental Management Representative, representatives from the Proponent, the contractor/s, relevant local community and business groups, and relevant Councils unless otherwise agreed by the Director-General.

Environmental Management Representative

16. The Proponent shall employ an Environmental Management Representative (EMR) who demonstrates compliance with *AS/NZS ISO 14012:1996 Guidelines for Environmental Auditing: Qualification criteria for environmental auditors*.
17. The EMR shall be approved by the Director-General prior to the commencement of construction.
18. The EMR shall be available during construction activity at the site and be present on-site during any critical construction activities as defined in the Construction EMP.

19. The EMR shall:
- (a) have responsibility for considering and advising on matters specified in the conditions of approval and compliance with such;
 - (b) review and approve the Proponent's induction and training programme for all persons involved in the construction activities and monitor implementation;
 - (c) periodically audit the Proponent's environmental activities to evaluate the implementation, effectiveness and level of compliance of on-site construction activities with the EMP and associated plans and procedures, including carrying out site inspections at least fortnightly;
 - (d) record and provide a written report to the Proponent of non-conformances with the EMP and require the Proponent to undertake mitigation measures to avoid or minimise any adverse impacts on the environment or report required changes to the EMP;
 - (e) direct the Proponent to stop work immediately where considered necessary, if in the view of the EMR an unacceptable impact on the environment is likely to occur, or require other reasonable steps to be taken to avoid or minimise adverse impacts;
 - (f) review corrective and preventative actions to ensure the implementation of recommendations made from the audits and site inspections;
 - (g) report monthly to the project manager;
 - (h) review and approve minor revisions to the EMP;
 - (i) provide information for community consultation, liaison with regulators, and respond to customer environmental complaints as required;
 - (j) provide reports to the Department on matters relevant to the carrying out of the EMR role as necessary, including notifying the Department of any stop work notices; and
 - (k) certify the Construction and Operation EMPs in accordance with Conditions 21 and 26.

Environmental Management System

20. The Proponent shall ensure the appointment of construction and/or operation head contractors that have an Environmental Management System prepared in accordance with the AS/NZS ISO 14000 series or BS7750-1994 certified by an accredited certifier and/or have a proven environmental management performance record.

Construction Environmental Management Plan

21. Prior to the commencement of construction, a Construction Environmental Management Plan (CEMP) shall be prepared, following consultation with the EPA, DLWC, RTA, RIC, NSW Fisheries and relevant Councils.

The CEMP shall be prepared in accordance with the conditions of this approval, all relevant Acts and Regulations and accepted best practice management plans.

The CEMP shall be certified by the EMR as being in accordance with the conditions of approval prior to seeking approval of the Director-General. The

CEMP shall be approved by the Director-General prior to the commencement of substantial construction works.

22. The Construction EMP shall be made publicly available and shall:
- (a) address construction activities associated with all key construction sites including staging and timing of the proposed works;
 - (b) clearly identify on a map the location of the poles and ancillary facilities;
 - (c) cover specific environmental management objectives and strategies for the main environmental management elements and include, but not be limited to: water quality; noise and vibration; air quality; erosion and sedimentation; access and traffic; property acquisition and/or adjustments; heritage and archaeology; acid sulphate soils, contamination; spoil stockpiling and disposal, waste management; flora and fauna; street tree protection; weed control; hydrology and flooding; geotechnical issues; visual screening, landscaping and rehabilitation; refuelling and fuel storage areas, hazards and risks; energy use, resource use and recycling; and utilities.
 - (d) address, but not be limited to:
 - (i) identification of the statutory and other obligations which the Proponent is required to fulfil during project construction, including all approvals and consultations/agreements required from authorities and other stakeholders, and key legislation and policies which control the Proponent's construction of the project;
 - (ii) definition of the role, responsibility, authority, accountability and reporting of personnel relevant to the EMP;
 - (iii) measures to avoid and/or control the occurrence of environmental impacts;
 - (iv) measures (where practicable and cost effective) to provide positive environmental offsets to unavoidable environmental impacts;
 - (v) the role of the EMR;
 - (vi) environmental management Sub Plans for all construction processes which are important for the quality of the environment in respect of permanent and/or temporary works;
 - (vii) monitoring, inspection, and test plans for all activities and environmental qualities which are important to the environmental management of the project including performance criteria, specific tests, protocols (eg frequency and location) and Sub Plans to follow;
 - (viii) environmental management instructions for all complex environmental control processes which do not follow common practice or where the absence of such instructions could be potentially detrimental to the environment;
 - (ix) steps the Proponent intends to take to ensure that all plans and procedures are being complied with;
 - (x) consultation requirements with relevant government agencies;
 - (xi) community consultation and notification strategy (including local

community, Local Aboriginal Land Councils, relevant local Councils, and all relevant authorities) and the complaint handling procedures.

Specific requirements for some of the main environmental management elements referred to in (c) shall be as required under the conditions of this approval and/or as required under any licence or approval.

Environmental Monitoring - Construction

23. The Proponent shall submit to the Director-General, a report(s) in respect of the environmental performance of the construction works and compliance with the Construction EMP and any other relevant conditions of this approval. The report(s) shall be prepared within six months of the start of substantial construction and thereafter at six monthly intervals or at other such periods as requested by the Director-General to ensure adequate environmental performance over the duration of the construction works.
24. The report(s) shall include, but not be limited to, information on:
 - (a) applications for consents, licences and approvals, and responses from relevant authorities;
 - (b) implementation and effectiveness of environmental controls and conditions relating to the work undertaken;
 - (c) identification of construction impact predictions made in the EIS and any supplementary studies and details of the extent to which actual impacts reflected the predictions;
 - (d) details and analysis of results of environmental monitoring;
 - (e) number and details of any complaints, including summary of main areas of complaint, action taken, response given and intended strategies to reduce complaints of a similar nature; and
 - (f) any other matter relating to the compliance by the Proponent with the conditions of this approval or as requested by the Director-General.
25. The report(s) shall also be provided to the Community Working Group, Gosford City Council, Wyong Shire Council, and any relevant government agency nominated by the Director-General. The report(s) shall also be made publicly available. The report(s) shall be certified by the EMR.

Operation Environmental Management Plan

26. An Operation Environmental Management Plan (OEMP) shall be prepared prior to the commencement of operation. The Operation EMP shall be prepared in consultation with Gosford City Council, Wyong Shire Council, the Community Working Group and any relevant government agency nominated by the Director-General. The Operation EMP shall be prepared in accordance with the conditions of this approval, all relevant Acts and Regulations and accepted best practice management procedures.

The OEMP shall be certified by the EMR as being in accordance with the conditions of approval prior to seeking the approval of the Director-General. The OEMP shall be submitted to the Director-General prior to commissioning.

27. The Operation EMP shall be made publicly available and shall address, but not be limited to:
- (a) identification of the statutory and other obligations which the Proponent is required to fulfil including all licences/approvals and consultations/agreements required from authorities and other stakeholders, and key legislation and policies which control the Proponent's operation of the project;
 - (b) requirements of and compliance with relevant EPA guidelines;
 - (c) monitoring, inspection and test plans for all activities and environmental qualities which are important to the environmental performance of the project during its operation including description of potential site impacts, performance criteria, specific tests and monitoring requirements, protocols (eg frequency and location) and procedures to follow;
 - (d) steps the Proponent intends to take to ensure that all plans and procedures are being complied with;
 - (e) consultation requirements/arrangements with relevant government agencies, the local community, Gosford City Council, Wyong Shire Council, including complaints handling procedures; and
 - (f) management strategies for the environmental system elements including, but not limited to: noise; magnetic field monitoring; interference with electrical/electronic and other equipment (such as communication/receival devices); health and public safety; property impacts, landscaping and maintenance and issues relating to flora and fauna; hydrology and flooding; water quality; visual screening, landscaping and rehabilitation; maintenance; hazards and risks; waste management (removal/disposal); energy use and measures for minimisation; and
 - (g) identify measures to reduce the demand for energy/greenhouse gas emissions. The Operation EMP must also state how such measures will be implemented and success monitored.

Specific requirements for some of the main environmental management elements referred to in (f) shall be as detailed under the conditions of this approval and/or as required under any licence or approval.

28. All sampling strategies and protocols undertaken as part of the EMP shall include a quality assurance/quality control plan and shall be approved by the relevant regulatory agencies to ensure the effectiveness and quality of the monitoring programme. Only laboratories accredited by the National Association of Testing Authorities (NATA) can be used for laboratory analysis.

Environmental Impact Audit Report

29. An Environmental Impact Audit Report shall be prepared:
- (a) by an independent person(s) or organisation approved by the Director-General, at the Proponent's expense;
 - (b) submitted to the Director-General, Gosford City Council, Wyong Shire Council, and upon request by the Director-General, to any other relevant government authority;

- (c) within 2 months after the first 12 months of operation, or at any time as requested by the Director-General.
30. The Environmental Impact Audit Report shall:
- (a) assess the key impact predictions made in the EIS and any supplementary studies and detail the extent to which actual impacts reflect the EIS/Supplementary Studies' predictions during the first 12 months of operation or any other periods as required;
 - (b) assess the suitability of implemented mitigation measures and safeguards;
 - (c) assess compliance with the Operation EMP; and
 - (d) discuss results of consultation with the local community in terms of feedback/complaints on the construction and operation phases of the project and any issues of concern raised.

The Report shall be made publicly available after approval by the Director-General. The Proponent shall comply with all requirements of the Director-General and relevant authorities with respect to any reasonable measure arising from, or recommendations in, the report.

Flora and Fauna

31. As part of the Construction EMP referred to in Condition 21, the Proponent shall prepare a detailed Flora and Fauna Management Sub Plan which includes, but is not limited to:
- (a) the Flora and Fauna mitigation measures identified in Table 8 of the Flora and Fauna Assessment Report prepared by Ecotone Ecological Consultants Pty Ltd (Appendix D of the EIS);
 - (b) detailed plans and maps of the route alignment identifying sensitive areas in threatened species locations, important habitat areas and vegetation corridors;
 - (c) maps identifying all native vegetation clearing associated with all construction works;
 - (d) maps identifying the location and method of water crossing, including measures to minimise bank disturbance and erosion;
 - (e) detailed site specific methods for minimising vegetation clearance and protection of riparian vegetation and other vegetated areas;
 - (f) detailed Tree Protection Strategy to manage construction impacts on existing trees. This strategy shall identify any significant trees which may be affected during construction and detail appropriate management measures;
 - (g) maps and strategies outlining rehabilitation and revegetation plans for disturbed/cleared areas;
 - (h) detailed measures for controlling impacts due to spillage;
 - (i) management of debris and refuse;
 - (j) weed control procedures;
 - (k) ongoing maintenance.

32. If, during the course of construction, the Proponent becomes aware of the presence of any threatened species which are likely to be significantly affected, all work likely to affect the species shall cease immediately and the NPWS shall be consulted to determine an appropriate course of action prior to the recommencement of work at that site. Any required permit/consent(s) shall be obtained and shall be accompanied by appropriate supporting documentation. All recommendations by the NPWS shall be complied with prior to any works likely to affect any threatened species.
33. Seed of locally native tree and plant species or suitable tube stock shall be used for revegetation purposes to the satisfaction of a qualified bushland regeneration officer. Topsoil and leaf mulch shall be stripped and stored for placement back in the vegetation zone from where it was removed, subject to Condition 34.
34. Weed infested topsoil, as identified by a qualified bush officer, shall not be used in rehabilitation works unless it is to be sterilised or treated as specified by a qualified ecologist or the bushland regeneration officer.
35. The Proponent shall monitor the rehabilitation measures, in consultation with NSW Fisheries, DLWC, NPWS, and relevant Councils and incorporate the monitoring results into the reports prepared under Conditions 23 and 29.

Birdstrike

36. The Proponent shall monitor the incidence of birdstrike following the commissioning of the line and include the results in the environmental impact audit report referred to in Condition 29. The Director-General may require that appropriate mitigation measures be implemented if the monitoring indicates that the incidence of birdstrike is significant.

Traffic and Roadworks

37. As part of the Construction EMP referred to in Condition 21, a Construction Traffic Management Sub Plan shall be prepared, in consultation with the RTA and relevant Councils. The Sub Plan shall outline the key safety and traffic control measures that will be applied to minimise disruption and ensure that public safety and adequate access are maintained.

Prior to commencement of construction at specific sites or sections, the Proponent must ensure that a Traffic Control Plan, consistent with the Traffic Management Sub Plan, is prepared in consultation with the relevant road authority. The Control Plan must address the following:

- (a) construction traffic types and volumes, construction traffic routes and any disruption to traffic movements on public roads as a result of construction works;
- (b) traffic safety requirements and other measures to minimise impacts to traffic movements, including use of signage and other control mechanisms;
- (c) adequate access to properties during construction;
- (d) scheduling of works to minimise traffic disruption;
- (e) actions to be carried out should partial or total road closures and traffic detours be required (including the identification of parties to be consulted).

38. A road dilapidation report shall be prepared for all non-arterial roads likely to be used for construction prior to the commencement of construction and after construction is complete. Any road/footpath damage (aside from that resulting from normal wear and tear) attributable to the construction of the proposal, shall be repaired to a standard at least equivalent to that existing prior to the damage, at the cost of the Proponent and should be compliant with *Auspec 306U – Road openings and Restorations*.
39. The Proponent shall be responsible for minimising any disruption to services resulting from such work and shall be responsible for advising local residents and businesses on disruption to services.

Heritage and Archaeology

Indigenous Heritage

40. As part of the Construction EMP referred to in Condition 21, an Indigenous Heritage Management Sub Plan shall be prepared outlining procedures that are to be implemented if previously unidentified items/areas of potential indigenous archaeological significance are identified during construction works. This shall include the requirement to cease work immediately and contact the NPWS and relevant Local Aboriginal Land Council (LALC) to determine an appropriate course of action. Any required permit/consent(s) shall be obtained and shall be accompanied by appropriate supporting documentation.
41. The Proponent shall ensure that a representative of the Darkinjung LALC is invited to be present on-site during clearing and initial construction works in the following locations:
- midden site near the western bank of Narara Creek, near Dell Road (NC-M-1);
 - creek banks and adjacent raised terraces; and
 - narrow ridgeline separating the catchments of Narara and Bangalow Creeks.

Non-Indigenous Heritage

42. If previously unknown or unassessed sites of potential non-indigenous heritage are disturbed during the course of work, work must stop at that site, until the NSW Heritage Office has been notified, the site assessed by a qualified archaeologist and an Excavation Permit under Section 140 of the Heritage Act applied for and obtained, if appropriate.

Visual Impacts

43. As part of the Construction EMP referred to in Condition 21 and the Operation EMP referred to in Condition 26, as appropriate, the Proponent shall detail the proposed visual impact mitigation measures to be implemented along the route. The Proponent shall undertake all reasonable measures to minimise the visual impacts of the proposal including, but not limited to:
- (a) where practical, the use of conductors having low or non-reflecting surfaces in preference to those having high reflecting surfaces;
 - (b) selective planting of trees or other suitable vegetation to screen views of the line from nearby residences in consultation with affected landowners;
 - (c) where practical, painting of pole structures in appropriate colours;

- (d) consultation with affected residents regarding pole locations and appropriate plantings; and
- (e) minimising vegetation clearing during both construction and operation of the line.

Air Quality

44. As part of the Construction EMP referred to in Condition 21, a specific Construction Stage Air Quality Sub Plan shall be prepared. The Sub Plan shall promote the reduction of greenhouse gases by adopting energy efficient work practices and provide details of all dust control measures to be implemented during the construction stage. The Sub Plan shall include but not be limited to, the following:
- (a) measures to reduce dust from stockpiles and cleared areas and other exposed surfaces;
 - (b) developing and implementing procedures to minimise energy waste;
 - (c) conducting awareness programmes for all site personnel regarding energy conservation methods; and
 - (d) conducting regular energy audits during the project to identify and address energy wastage.
45. Where there is a risk of losing material, construction vehicles using public roads shall be maintained and covered to prevent any loss of load, whether in the form of dust, liquid, solids. Construction vehicles shall be maintained in such a manner, that they would not track mud, dirt or other material onto any street, which is opened and accessible to the public. In the event of any spillage, the Proponent is required to remove the spilt material within 24 hours.
46. No burning or incineration of materials shall be permitted on project sites.

Noise and Vibration

Noise Management and Vibration Management Sub Plan

47. As part of the Construction EMP referred to in Condition 21, the Proponent shall prepare a detailed Noise and Vibration Management Sub Plan, in consultation with the Director-General and relevant Councils. The Plan shall provide details of noise standards to be met, noise monitoring requirements and noise control measures to be undertaken during construction. A copy of the finalised Sub Plan shall be forwarded to the EPA and relevant Councils.
48. The Plan shall include, but not be limited to:
- (a) tests for ascertaining acoustic parameters;
 - (b) anticipated airborne noise for all major noise generating activities and locations and duration of these activities;
 - (c) noise control equipment to be fitted to machinery;
 - (d) temporary noise mitigation measures such as noise barriers to be installed prior to the commencement of noisy activities;
 - (e) predicted noise levels at any sensitive receivers (such as schools, churches, hospitals etc);

- (f) noise monitoring and reporting procedures;
- (g) measures for dealing with exceedances;
- (h) arrangements to inform residents of construction activities likely to affect their amenity, and contact point for residents;
- (i) compliance with relevant EPA guidelines as far as practicable, including the Environmental Noise Control Manual, and as set out in Condition 49. The Sub Plan must clearly demonstrate how compliance will be achieved; and
- (j) noise monitoring to be undertaken if noise complaints are received.

Construction Noise

49. The Proponent must aim to ensure that construction noise meets the following guideline levels:
- For a construction period of four weeks and under, the L_{10} level, measured over a period of not less than 15 minutes when the construction site is in operation, must not exceed the background level by more than 20 dB(A).
 - For a construction period of greater than four weeks and not exceeding 26 weeks, the L_{10} level, measured over a period of not less than 15 minutes when the construction site is in operation, must not exceed the background level by more than 10 dB(A).
 - For a construction period greater than 26 weeks, the L_{10} level, measured over a period of not less than 15 minutes when the construction site is in operation, must not exceed the existing background noise level by more than 5 dB(A).
- A value of 5 dB(A) shall be added to the sound pressure levels recorded from the construction activities if the noise is substantially tonal or impulsive in character.
50. Achievement of the above levels in Condition 49 shall be sought through best practicable means. In situations where it is identified that these levels would not be achieved, then all reasonable measures shall be undertaken to reduce the level of noise impact.

Construction Hours

51. All construction activities including entry and departure of heavy vehicles shall be restricted to the hours 7:00 am to 6:00 pm (Monday to Friday); 8:00 am to 1:00 pm (Saturday) and at no time on Sundays and public holidays. Noisy activities, such as significant earthworks, shall be restricted to the hours 8.00 am to 4.00 pm Monday to Friday only, when within 100 metres of any residence.
52. Works outside these hours that may be permitted include:
- any works which do not cause noise emissions to be audible at any nearby residential property;
 - the delivery of materials which is required outside these hours requested by police or other authorities for safety reasons;
 - emergency work to avoid the loss of lives and/or property and/or to prevent environmental harm; and
 - any other work as approved by the Director-General.

Soil and Water Management

53. As part of the EMP(s) referred to in Condition 21 and 26, the Proponent shall prepare a comprehensive Soil and Water Management Sub Plan in consultation with the DLWC and all relevant Councils. The Sub Plan shall be prepared in accordance with the Department of Housing's guideline *Managing Urban Stormwater – Soils and Construction (1998)*. The Sub Plan shall provide full details of all pollution control measures to be undertaken during the construction stage and satisfy all requirements for pollution control approval/licences.
54. The Soil and Water Management Sub Plan shall incorporate detailed erosion and sedimentation controls and site rehabilitation requirements, which shall be prepared in consultation with DLWC. Erosion and sedimentation mitigation measures shall be implemented for all areas that are considered at risk.

Acid Sulphate Soils Management

55. As part of the Construction EMP referred to in Condition 21, a detailed Acid Sulphate Soil Management Sub Plan must be prepared prior to the commencement of construction works. It shall be prepared in consultation with relevant Councils and in accordance with the *ASSMAC Acid Sulphate Soil Manual (1998)* or as revised.
56. The Sub Plan shall address how management strategies would be integrated into the construction procedures and how any impacts would be minimised and managed effectively, and include a contingency plan to deal with the unexpected disturbance of potential or actual acid sulphate soils.

Contaminated Land

57. As part of the Construction EMP referred to in Condition 21, the Proponent shall prepare a Contaminated Soils Management Sub Plan. The Sub Plan shall address, but not be limited to:
 - (a) procedures for soil investigations prior to excavation works;
 - (b) occupational health and safety procedures;
 - (c) safeguards to prevent the migration of excavated material, leachate, or runoff;
 - (d) a contingency plan to deal with unexpected occurrences of contaminated material during the course of work; and
 - (e) disposal requirements. If contaminated material is disposed of off-site, the Proponent must examine all feasible options and this must be in accordance with the Waste Avoidance and Resources Recovery Act 2001 and the EPA's Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes.

Waste Management and Re-Use Sub Plan

58. As part of the EMP(s) (Construction Stage) and (Operation Stage) as relevant, a detailed Waste Management and Reuse Sub Plan shall be prepared. The Sub Plan shall address the management of wastes during the construction and operation stages respectively. It shall be prepared prior to construction and be consistent with the Waste Avoidance and Resources Recovery Act 2001, and the EPA's

Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes, and shall identify requirements for:

- a) waste avoidance;
- b) reduction;
- c) reuse; and
- d) recycling,

and provide details of requirements for:

- (e) handling;
- (f) stockpiling;
- (g) disposal of wastes: specifically contaminated soil or water, concrete, demolition material, cleared vegetation, oils, grease, lubricants, sanitary wastes, timber, glass, metal, etc; and
- (h) identifying any site for final disposal of any material and any remedial works required at the disposal site before accepting the material.

59. Any waste material that is unable to be recycled shall be disposed at a landfill licensed by the EPA to receive that type of waste. The Sub Plan shall be framed using the waste minimisation hierarchy principles of avoid-reduce-reuse-recycle-dispose. This shall also include the demand for water.
60. As part of the Sub Plan, an Action Plan shall be prepared to promote the use of recycled materials, including construction and landscape materials. The Plan shall detail how the proposal gives consideration and support to the Government's *Waste Reduction and Purchasing Policy*. The Plan shall also include details on measures to implement energy conservation best practice.

Infrastructure Facilities, Utilities and Services

61. The Proponent shall, in consultation with the relevant service authorities, identify all infrastructure facilities, utilities and services potentially affected by construction activities to determine requirements for diversion, protection and/or support. Any alterations to these facilities, utilities and services shall be carried out to the satisfaction of the relevant authorities. The costs of any alterations shall be borne by the Proponent unless otherwise agreed to by the affected authorities.
62. The Proponent shall be responsible for minimising any disruption to services resulting from such work and shall be responsible for advising local residents and businesses of disruptions to services.
63. Appropriate clearances from all existing buildings/structures shall be maintained in the construction of the transmission line. The Proponent shall ensure that there are no known development proposals within the vicinity of the proposal that would be potentially restricted by the need to maintain clearances to overhead electricity transmission lines.
64. The Proponent shall develop a contingency plan, in consultation with the relevant service provider(s), to deal with accidental damage and repair of facilities/services.

Hazards and Risk

Construction Risk Management

65. The Proponent shall prepare and implement a Construction Safety Sub Plan to manage hazardous incidents and public safety during the construction of the transmission line. The Sub Plan shall include, but not necessarily be limited to:
- (a) physical measures to be implemented to minimise the potential for public harm at and in the vicinity of construction areas;
 - (b) a programme to ensure that safety measures implemented to minimise the potential for harm to the public remain in place and are adequately maintained while hazardous situations exist;
 - (c) procedures for the notification of residents in the vicinity of construction sites whose safety may be affected by construction activities;
 - (d) procedures to manage risk to construction workers;
 - (e) identification of utilities that may be affected by construction of the transmission line, either directly or indirectly, and methods to minimise those impacts;
 - (f) procedures to be followed in the event that contaminated material is discovered during any excavation works;
 - (g) measures to be implemented to ensure safe transport of construction materials, including transport routes, transport times, vehicle speeds and driver behavioural requirements;
 - (h) measures to be implemented to ensure the safe handling of hazardous materials and to minimise the potential for spills of those materials;
 - (i) a protocol to manage the on-site refuelling of vehicles during construction; and
 - (j) contingency measures to contain, minimise and rehabilitate a spill of hazardous materials, should it occur.

The Construction Safety Sub Plan shall be submitted for the approval of the Director-General prior to the commencement of any construction activity, or within such period otherwise agreed by the Director-General.

Operation Risk Management

66. The Proponent shall prepare and implement an Emergency Sub Plan to manage emergency events that may arise in relation to the transmission line. The Plan shall include, but not necessarily be limited to:
- (a) identification of emergencies that may arise in relation to the transmission line;
 - (b) procedures to be followed to address potential emergencies and minimise the impacts of emergencies on surrounding land uses;
 - (c) monitoring and communication systems installed to indicate an emergency;
 - (d) details of fire safety measures where relevant;
 - (e) procedures for the notification of relevant emergency services, authorities and affected receptors of an emergency situation; and

- (f) a system to investigate and address the cause(s) of any emergency to prevent recurrence.

The Emergency Sub Plan shall be submitted for the approval of the Director-General prior to the commencement of operation of the transmission line, or within such period otherwise agreed by the Director-General.

Security and Crime Management

67. The Proponent shall prepare and implement a Security and Crime Management Strategy to prevent unauthorised public ingress or access to relevant components of the transmission line, and to minimise the potential for crime in the vicinity of the line (eg vandalism, loitering, illegal dumping etc). The Strategy shall be generally in accordance with the principles outlined in the joint Department and Police Service publication *Crime Prevention and the Assessment of Development Applications*, and be developed in consultation with the NSW Police Service and relevant Councils. The Strategy shall include, but not necessarily be limited to:
- (a) details of security arrangements to prevent unauthorised access to all relevant components of the transmission line, including physical exclusion measures, detection devices and management mechanisms;
 - (b) procedures for addressing security issues, should they arise;
 - (c) specific design features intended to discourage the incidence of crime at and in the immediate vicinity of relevant components of the transmission line;
 - (d) lighting considerations, including light intensity, direction and hours of operation at and in the immediate vicinity of relevant components of the transmission line, with the aim of minimising areas that may encourage crime;
 - (e) policies and procedures for the management and removal of graffiti, amelioration of vandalism, should it occur at or on any relevant component of the transmission line; and,
 - (f) policies and procedures for the management and removal of illegal or inappropriate bill-posting and illegally dumped materials, should it occur at or on any relevant component of the transmission line.

The Security and Crime Management Strategy shall be submitted for the approval of the Director-General prior to the commencement of construction of the transmission line, or within such period otherwise agreed by the Director-General.

This condition only applies to “relevant” components of the electricity cable and associated infrastructure. That is, this condition only applies to those components that may be subject to security or crime issues.

Note: Any modifications to the proposal, which would be inconsistent with the conditions of approval, shall only be carried out with the prior written approval of the Minister. Refer to Section 115BA and Section 115BAA of the *Environmental Planning and Assessment Act 1979* for assistance in determining consistency.