



Queensland Government
State Development and Innovation

Queensland Coke Plant and Power Station Project

**Queensland Coke & Energy Pty Ltd
Stanwell Corporation Limited**

TERMS OF REFERENCE FOR AN ENVIRONMENTAL IMPACT STATEMENT

**UNDER PART (4) OF THE QUEENSLAND
STATE DEVELOPMENT AND PUBLIC WORKS ORGANISATION ACT
1971**

MAY 2005

PREAMBLE

Project Background

Queensland Coke & Energy Pty Ltd (QCE) is investigating the feasibility of developing a coke plant to produce metallurgical coke for export to steel producers. Surplus heat from the coking process would be captured and used to produce steam for the generation of electricity. QCE would be responsible for the coke making operations and Stanwell Corporation Limited (SCL) would be responsible for the generation of electricity.

The proposed location of the Project is the Stanwell Energy Park (SEP), which is located off the Capricorn Highway approximately 25km south west of Rockhampton and 129km by rail from Gladstone in Central Queensland.

Project Proponents

The Project is a joint venture involving QCE (a subsidiary of Macarthur Coal Limited) and SCL (the "Proponents").

Macarthur Coal Limited is a Queensland based coal mining company listed on the Australian Stock Exchange with a market capitalisation of over \$600 million. The company presently operates two coal mines west of Mackay in Central Queensland, Coppabella and Moorvale, producing a total of 6.2 million tonnes per annum (Mtpa) of low volatile Pulverised Coal Injection (PCI) and thermal coal.

Stanwell Corporation Limited is a Queensland Government owned company established under the *Government Owned Corporations Act (1993)* (Qld) and is registered under the *Corporations Act 2001* (C'th). The Corporation is one of Australia's leading generators (1,643MW) of environmentally responsible electricity with an extensive portfolio of coal-fired, gas-fired, wind, hydro, and bio-energy power generation facilities. It is envisaged that SCL's rights and interests in the Project will be held by a wholly owned subsidiary of SCL, approval for the incorporation of which will be sought when the Project is further developed.

Project Summary

QCE proposes to construct and operate a coke plant that would employ modern heat recovery coke making technology to produce a high quality blast furnace coke for the export market, using coal sourced from Queensland mines. The technology uses heat generated from the combustion of gases contained within the coal to convert coal into coke. SCL proposes to construct a new power station on a site adjacent to the coke plant and to generate electricity using steam produced from waste heat from the coke plant.

The current concept is to construct a coke plant with an initial production capacity of 1.6Mtpa, allowing for expansion to 3.2Mtpa, subject to market commitments. At the 3.2Mtpa level the Project would consume approximately 5.0Mtpa of Bowen Basin coking coal. It is expected that new coking coal production capacity would be developed to meet the long-term requirements of the Project. The coke would be transported by rail to the Port of Gladstone for export to markets in Asia, Europe and the Americas. Excess heat, generated by the combustion of coal gases in the coke plant, would be used to produce steam to generate electricity for the National Electricity Market. The Project could generate up to 370MW of electricity under the 3.2Mtpa coke production scenario.

Project Components and Staging

Coke Plant

The coke plant would be situated on a separate site adjacent to the Stanwell Power Station (SPS) and is proposed to be constructed in two stages. The first stage is intended to produce 1.6Mtpa of coke and the second stage a further 1.6Mtpa. It is envisaged that the coke plant, after completion of stage 2, would comprise approximately 640 coke ovens. Each oven would be 14.3m long and 3.7m wide. The plant is expected to require an area in the order of 100 hectares. The coke plant would consist of banks of coke ovens (batteries) with each battery serviced by a coke pusher and coal-charging machine that operates on the outside of the ovens. A flat bed hot coke-receiving car operates on the inside of the battery. Each set of parallel oven banks is serviced by heat recovery boilers, water quenching towers and wastewater collection, and dust suppression equipment.

The key elements to note about the production process are:

- Coke is produced by heating coal, in a controlled atmosphere, thus liberating volatile matter (gas and moisture);
- The gas is combusted in an environmentally “smart” way so as to produce the heat to make the coke. Excess heat is produced in the process and this is used to generate steam using heat recovery steam generators (HRSG);
- The process does not rely on the combustion of coal, only the gas liberated from the coal; and
- The greenhouse gas emissions of the process are typical of a simple gas-fired power generator (that is, one that raises steam that passes through a turbine).

Power Station

It is intended to construct appropriately sized power generation facilities, possibly up to 370MW, within the SPS site. These facilities would consist of a stand-alone power station (turbo alternator, condenser, cooling water pumps and a switchyard), or a combination of a stand-alone power station and pipe work which would use some of the excess heat to generate additional electricity in the existing SPS. The steam produced from the coke plant’s HRSGs would be used to drive the power station’s steam turbine generator. The electricity produced would be supplied to the grid and to the coke plant.

Raw Materials Storage and Handling

Coal would be delivered to the coke plant site via the existing SPS rail loop, which is connected to the main Blackwater Rail System by a dedicated spur line approximately 1km long. The SPS loop is currently designed only to accommodate loaded trains entering the loop from the west and empty trains returning in the same direction. The Proponents anticipate that the rail loop would need to be modified to enable trains to leave the SPS site turning east to the port.

It is estimated that based on an annual coal consumption of 5.0Mt for the coke Project, and deliveries in standard Blackwater train consists, an additional 16 trains per week would be required.

Coal delivered to the existing SPS unloading hopper is proposed to be transferred to a new conveyor taking coal to an elevated stacking conveyor for discharging on to individual stockpiles. Coal is then reclaimed by front-end loaders from the stockpiles into hoppers. A blended feed can then be conveyed to a surge bin, which would be the interface with the coke plant coal charging system.

Coke Product Transport and Port Handling

It is proposed that coke would be railed 129km to a new wharf export facility at Fisherman's Landing, between the Cement Australia (CA) wharf and Comalco's new wharf at Gladstone.

The current concept is for coke produced at the SEP site to be crushed to a top size limit of 100mm, screened to remove fines then loaded into standard Blackwater train consists of approximately 4,200 tonnes of coke. Coke fines generated at the site may be used in power station feedstock or recycled back into the coke oven charge. Queensland Rail and the Proponents will investigate the most effective train consist for the process.

The coke would exit the loop in an easterly direction towards the Gladstone port. It is estimated that approximately 15 trains consists of 4,200 tonnes of coke would be required per week.

Once at Gladstone the coke would be discharged from trains via a new rail unloader to be constructed within the existing CA rail loop. A coke stockyard and reclaim facility would be constructed adjacent to the loop on land controlled by the Central Queensland Ports Authority (CQPA). The coke would then be conveyed to the new wharf and ship loader after being screened to remove fines generated during transport and handling. The fines may be sold to CA or other local markets as a fuel feedstock.

Further details of the Project are available in the Initial Advice Statement (IAS), a copy of which can be downloaded from the Department of State Development and Innovation website at: <http://www.sdi.qld.gov.au>.

ADMINISTRATIVE DETAILS FOR THESE TERMS OF REFERENCE

The Legislative Framework

The Project was declared to be a “significant project” under Section 26 of the Queensland *State Development and Public Works Organisation Act 1971 (SDPWOA)* by the Coordinator-General (CoG) on 23 December 2004. Matters considered by the CoG in making this declaration included information in an Initial Advice Statement prepared by the Proponents, the level of investment necessary for the Project, employment opportunities provided by the Project, potential impact on the environment, potential effects on relevant infrastructure and the significance of the Project to the region and State. The declaration initiates the statutory environmental impact assessment procedure of Part 4 of this Act, which requires the Proponents to prepare an Environmental Impact Statement (EIS) for the Project.

The Department of State Development and Innovation (DSDI) is responsible for managing the environmental impact assessment process on behalf of the CoG. DSDI has invited relevant Commonwealth, State and Local Government representatives and authorities to participate in the process as Advisory Agencies.

The first step in the impact assessment process is the development of Terms of Reference (ToR) for the preparation of an EIS. The process involves the formulation of draft ToR which are made available for public and government agency comment. The CoG has regard to all comments received on the Draft ToR in finalising the ToR, which will be presented to the Proponents. This document represents the Draft Terms of Reference for public comment.

The statutory impact assessment process under the *SDPWOA* is also the subject of a bilateral agreement between the Queensland and the Commonwealth Governments in relation to environmental assessment under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. The Proponents referred the Proposal to the Commonwealth Minister for the Environment and Heritage in accordance with the provisions of the *EPBC Act*, which is administered by the Environment Assessment and Approvals Branch of the Department of Environment and Heritage (DEH). The Commonwealth Minister decided, on 7 March 2005, that the Proposal did not constitute a controlled action under Section 75 of the *EPBC Act*.

The Proponents will prepare a draft EIS to address the ToR. Once the EIS has been prepared to the satisfaction of the CoG, a public notice is advertised in relevant newspapers circulating in the district and the State. The notice will state: where copies of the EIS are available for inspection and how it can be purchased; that submissions may be made to the CoG about the EIS; and the submission period. The Proponents may be required to prepare a Supplementary Report to the EIS to address specific matters raised in submissions on the EIS.

At the completion of the EIS phase, the CoG will prepare a report evaluating the EIS and other related material, pursuant to Section 35 of *SDPWOA*. The CoG Report will include an evaluation of the environmental effects of the proposed Project and any related matters. The Report will reach a conclusion about the environmental effects and any associated mitigation measures, taking into account all of the relevant material including: the EIS; all properly made submissions and other submissions accepted by the CoG; and any other material the CoG considers is relevant to the Project, such as a Supplementary Report to the EIS, comments and advice from Advisory Agencies, technical reports on specific components of the Project and legal advice.

The Project involves development that would require an application for development approval for material change of use and/or impact assessment under the *Integrated Planning Act 1997 (IPA)*. Consequently, the CoG Report may, under s.39 of *SDPWOA*, state for the assessment manager one or more of the following:

- the conditions that must attach to the development approval;
- that the development approval must be for part only of the development;
- that the approval must be preliminary approval only.

Alternatively the Report must state for the assessment manager –

- that there are no conditions or requirements for the Project; or
- that the application for development approval be refused.

Further, the Report must:

- give reasons for the statements (above); and
- be given to the assessment manager for the application by the CoG.

Development approvals under *IPA* would be sought separately for the coke plant site, the power station site and port facilities.

Further to the above *IPA* approvals, other approvals likely to be required include: the *Environmental Protection Act 1994 (EP Act)*; *Vegetation Management Act 1999 (VMA)*; *Water Act 2000*; *Nature Conservation Act 1999*; *Fisheries Act 1994*; *Aboriginal Cultural Heritage Act 2003*; *Transport Infrastructure Act 1994*; *Transport Planning and Coordination Act 1994*; and *Transport Operations (Road Use Management) Act 1995*.¹

Results of Consultation on these Terms of Reference

Advertisements were placed in the *Rockhampton Morning Bulletin*, *The Gladstone Observer* and the *Courier Mail* newspapers on Saturday 12 March 2005, inviting public comment on the draft ToR for the Coke Plant and Power Station Project. A similar notice was placed on the DSDI internet site. Hard copies of the draft ToR were also available for viewing from DSDI offices in Brisbane, Gladstone and Rockhampton, the Calliope Shire Council office in Calliope and the Fitzroy Shire Council Office in Gracemere.

The period for receipt of submissions closed on 8 April 2005, however late submissions were accepted from government agencies until 27 April 2005. A total of 21 written submissions were received, including nineteen (19) from Government agencies and two (2) from regional stakeholders. Copies of these have been forwarded to the Proponents, Queensland Coke & Energy Pty Ltd and Stanwell Corporation Limited.

The content of all submissions has been reviewed and considered by DSDI in finalising the ToR for the EIS for the Coke Plant and Power Station Project. **Amendments to the draft ToR, which have arisen from recommendations made in submissions, are referenced in this document as footnotes.**

The following is a list of responses and submissions received:

No.	Agency/Individual	Date	Abbrev
1	Department of Housing	22/03/05	DOH
2	Department of Employment and Training	4/04/05	DET
3	Department of Industrial Relations*	4/04/05	DIR
4	Department of Transport	5/04/05	DOT
5	Department of Aboriginal and Torres Strait Islander Affairs*	6/04/05	DATSIP
6	Department of Communities	7/04/05	DOC

¹ DMR (2)

7	Department of Employment and Training	8/04/05	DET
8	Environmental Protection Agency	8/04/05	EPA
9	Department of Local Government, Planning, Sport and Recreation	8/04/05	DLGPSR
10	Queensland Treasury	8/04/05	QT
11	Regional Engineering Group	8/04/05	REG
12	Department of Education and the Arts	11/04/05	DEA
13	Department of Emergency Services	11/04/05	DES
14	Department of Primary Industries and Fisheries	11/04/05	DPIF
15	Rockhampton City Council	11/04/05	RCC
16	Department of Natural Resources and Mines	12/04/05	DNRM
17	Department of Main Roads	13/04/05	DMR
18	Queensland Rail	14/04/05	QR
19	Fitzroy Shire Council	14/04/05	FSC
20	Central Queensland Ports Authority	14/04/05	CQPA
21	Queensland Health	27/04/05	QH

* Note: these government agencies indicated that they did not wish to participate as an Advisory Agency for the EIS for the Coke Plant and Power Station Project.

These ToR provide information in two broad categories:

- Part A – Information and advice on the preparation of the EIS;
- Part B – Specific requirements – Contents of the EIS.

For further inquiries about the EIS process for the Project, please contact:

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ABBREVIATIONS

The following abbreviations have been used in this document:

ACH Act	<i>Aboriginal Cultural Heritage Act 2003 (Qld)</i>
AHD	Australian Height Datum
CA	Cement Australia Pty Limited
CHMP	Cultural Heritage Management Plan
CO	Carbon Monoxide
CO₂	Carbon Dioxide
CoG	The Coordinator-General of the State of Queensland
CQPA	Central Queensland Ports Authority
DEH	Commonwealth Department of the Environment and Heritage
DNRM	Queensland Department of Natural Resources and Mines
DSDI	Queensland Department of State Development and Innovation
EIS	Environmental Impact Statement, as defined by Part 4 of the <i>State Development & Public Works Organisation Act 1971</i>
EMP	Environmental Management Plan
EP Act	<i>Environmental Protection Act 1994 (Qld)</i>
EPA	Queensland Environmental Protection Agency
EPBC Act	<i>Environment Protection & Biodiversity Conservation Act (C'wlth) 1999</i>
EPP	<i>Environmental Protection Policy</i>
ERA	Environmentally Relevant Activity
HRSG	Heat Recovery Steam Generator
IAS	Initial Advice Statement, as defined by Part 4 of the <i>State Development & Public Works Organisation Act 1971</i>
IPA	<i>Integrated Planning Act 1997 (Qld)</i>
Mtpa	Million tonnes per annum
NCA	<i>Nature Conservation Act 1992 (Qld)</i>
NOx	Nitrous Oxides
PM_{2.5}	Particulate Matter with an aerodynamic diameter of less than 2.5 micrometre (µm)
PM₁₀	Particulate Matter with an aerodynamic diameter of less than 10 micrometre (µm)
QCE	Queensland Coke & Energy Pty Ltd
SDPWOA	<i>State Development & Public Works Organisation Act 1971(Qld)</i>
SCL	Stanwell Corporation Limited
SEP	Stanwell Energy Park
SOx	Sulphur Oxides
SPS	Stanwell Power Station
STP	Sewerage Treatment Plant

ToR	Terms of Reference as defined by Part 4 of the <i>State Development & Public Works Organisation Act 1971</i>
VMA	<i>Vegetation Management Act 1999 (Qld)</i>
VOC	Volatile Organic Compounds ²

² EPA (13)

Part A: INFORMATION AND ADVICE ON PREPARATION OF THE EIS

1. Introduction

These Terms of Reference (ToR) for an Environmental Impact Statement (EIS) for the Queensland Coke Plant and Power Station Project have been developed in accordance with the requirements of Sections 29 and 30 of the *State Development & Public Works Organisation Act 1971 (SDPWOA)*. The objective of the ToR is to identify those matters that should be addressed in the EIS. The ToR are based on the initial outline of the proposed Project given in the Initial Advice Statement (IAS).

The State and local governments, from which the Project Proponent requires approvals, may request additional information on any matter not adequately dealt with in the EIS. In order to clarify the nature and level of investigations that are envisaged in the ToR, the Proponent may contact relevant Government agencies (known as Advisory Agencies), peak community interest organisations and relevant individuals and groups as necessary. However the Coordinator-General (CoG) reserves the final decision on interpretation of the requirements of the ToR.

Reference to any culturally sensitive confidential information should be indicative only and disclosure of any such information must be negotiated with traditional custodians; other confidential information supplied by or to the Proponents must be clearly identified and placed in discrete attachments to the main report.

2. EIS Objectives

The objective of the EIS is to identify potential environmental, social and economic impacts (both beneficial and adverse)³ and to ensure that adverse impacts are avoided where possible. Unavoidable impacts (direct, indirect and cumulative) must be examined fully and addressed, so that the development of the Project, including the selection of the preferred sites for each of the Project elements, is based on sound environmental protection and management criteria. Consistent with this objective, the EIS should be a self-contained and comprehensive document containing sufficient information to make an informed decision on the potential impacts.

The document should provide:

- For interested bodies and persons: a basis for understanding the Project, alternatives and preferred solutions, the existing environment that would be affected, both on and off the sites, the impacts that may occur, and the measures to be taken to mitigate all adverse impacts.
- For groups or persons with rights or interests in land: an outline of the effects of the proposed Project on that land including access arrangements.
- For the CoG and other Government decision makers: a framework against which decision-makers are able to consider the environmental aspects of the proposed Project in view of legislative and policy provisions and decide whether the Project can proceed or not; to set conditions for approval to ensure environmentally sound development as appropriate, and where required by legislation, recommend an environmental management and monitoring program.
- For the Proponents: a definitive statement of measures or actions to be undertaken to minimise any adverse impacts during and following the implementation of the proposed Project. A draft Environmental Management Plan that describes acceptable impacts and environmental management strategies to agreed performance criteria is the recommended means of achieving this objective.

³ DMR (4)&(8)

Completion of the EIS to the satisfaction of the final ToR does not mean the Project will necessarily be approved.

3. Main EIS Guidelines

The EIS should relate to the entire life of the Project including construction, operation, maintenance, and decommissioning. The EIS should enable reasonable economic and technically achievable conditions to be developed to ensure that the impact of the Project is reduced to acceptable levels. The level of analysis and detail in the EIS should reflect the level of significance of particular impacts.

The EIS should state the following about information given in the EIS:

- the source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

Where possible, information provided in the EIS should be clear, logical, objective and concise, so that non-technical persons may easily understand it. Where appropriate, text should be supported by maps and diagrams. Factual information contained in the document should be referenced wherever possible. Where applicable, aerial photography and/or digital information (e.g. of Project sites, road, rail and conveyor corridors etc) should be presented.

The terms “describe”, “detail” and “discuss” should be taken to include both quantitative and qualitative matters as practicable and meaningful. Similarly, adverse and beneficial effects should be presented in quantitative and/or qualitative terms as appropriate.

Within these ToR, the term “Project” includes all activities undertaken within the SEP associated with the coke plant, power generation, materials handling, storage and transport facilities and supporting Project infrastructure (e.g. any new or expanded rail infrastructure, water pipelines and dams, powerlines etc), as well as transport, handling, storage and shipment of coke between the SEP and the wharf facilities at Fisherman’s Landing in Gladstone. Where existing facilities are to be used to support the Project (e.g. existing coal unloading, rail and port facilities), the potential for a significant increase in environmental impact arising from Project activities is to be discussed. Where there is a likelihood of a significant increase in environmental impact, the impact should be described and detailed.

For the purposes of the EIS, the “Project” does not include any upstream coal mine development and associated transportation components. Impact assessment for any such development would be undertaken in a separate process.

4. Stakeholder Consultation

To facilitate the assessment process, the Proponents are strongly encouraged to regularly consult with Advisory Agencies and other appropriate stakeholders throughout the EIS process.

It is the responsibility of the Proponents, in consultation with Advisory Agencies, to identify legislation, policies and methodologies relevant to the EIS process, and to determine appropriate parts of the community which should be consulted during the EIS preparation stage. It is recommended that an open community consultation process be carried out in addition to the legislated environmental impact assessment process. Copies of the EIS will be provided to all Advisory Agencies and on request to relevant individuals and peak groups with an interest in the Project.

5. General EIS format

The EIS should be written in a format matching the ToR or include guidelines (preferably as an appendix) describing how the EIS responds to the ToR.

The main text of the EIS is to include appendices containing:

- a copy of the final ToR;
- a list of persons and agencies consulted during the EIS;
- a list of Advisory Agencies with an appropriate contact; and
- the names of, and work done by, all personnel involved in the preparation of the EIS.

Maps, diagrams and other illustrative material should be included in the EIS.

The EIS should be produced on A4-size paper capable of being photocopied, with maps and diagrams on A4 or A3 size. The EIS should also be produced on CD ROM. CD ROM copies should be in ADOBE® *.pdf format for placement on the internet. All compression must be down-sampled to 72 dpi (or ppi). PDF documents should be no larger than 500 kB in file size. The executive summary should be supplied in HTML 3.2 format with *.jpg graphics files. Text size and graphics files included in the PDF document should be of sufficient resolution to facilitate reading and enable legible printing, but should be such as to keep within the 500kB file size.

Part B: SPECIFIC REQUIREMENTS – CONTENTS OF THE EIS

Executive Summary

The Executive Summary should be written as a stand-alone document, able to be reproduced on request for interested parties who may not wish to read or purchase the EIS as a whole. The structure of the executive summary should follow that of the EIS, though focused strongly on the key issues allowing the reader to obtain a clear understanding of the proposed Project, its environmental and socio-economic implications and management objectives.

The summary should include:

- the title of the Project;
- name and contact details of the Proponents, and a discussion of previous projects undertaken by the Proponents and their commitment to effective environmental management;
- a concise statement of the aims and objectives of the Project;
- the legal framework, decision-making authorities and agencies involved;
- an outline of the background to, and need for, the Project, including the consequences of not proceeding with the Project;
- an outline of the alternative options considered and reasons for the selection of the proposed development option;
- a brief description of the Project (pre-construction, construction and operational activities) and the existing environment, utilising visual aids where appropriate; and
- an outline of the principal environmental impacts predicted, and proposed environmental management strategies (including waste minimisation and management) and commitments to minimise the significance of these impacts.

Glossary of Terms

A glossary of technical terms and acronyms should be provided.

1. Introduction

The introduction should explain the function of the EIS, why the EIS has been prepared and what it sets out to achieve. In particular, the introduction should outline the level of detail of information required to meet the level of approval being sought. It should also define the audience to whom it is directed, and contain an overview of the structure of the document. Factual information contained in the document should be referenced wherever possible.

1.1 PROJECT PROPONENTS

This section should provide details of the Proponents, Queensland Coke and Energy Pty Ltd and Stanwell Corporation Limited, the relationship between the two companies for the Project and postal addresses and key contact details for the Proponents' Project staff and any Project consultants.

1.2 PROJECT DESCRIPTION

This section should provide a brief description of the key elements of the Project including associated infrastructure requirements with specific locations illustrated on maps. This section

should clearly indicate the individual sites for the coke plant and the new power station, and describe the relationship of the Project with the existing Stanwell Power Station infrastructure and the port facilities, specifically in relation to any proposed infrastructure sharing arrangements and likely issues for transportation by rail.

A brief description should be provided of studies or surveys which have been undertaken for the purposes of developing the Project and preparing the EIS. This should include reference to relevant baseline studies and investigations undertaken previously for the Project site and surrounding area.

1.3 PROJECT OBJECTIVES, RATIONALE AND ALTERNATIVES

This section should provide a statement of the objectives which have led to the development of the proposal and a brief outline of the events leading up to the proposal's formulation, envisaged time scale for implementation and Project life, anticipated establishment costs and actions already undertaken within the Project area.

The EIS should outline the current status of the Project and the relationship of the Project to other developments or actions that may relate to it, whether or not they have been approved.

The rationale and justification for the Project should be explained in relation to current issues in the coke production industry and any relevant policy or regulatory framework, Australian or overseas market requirements and expected local, regional, State or national benefits. Justification for the Project should be described, with particular reference to the environmental, economic and social costs and benefits, including employment and spin-off business development, which the Project may provide.

The interdependencies of the Project components should be explained, particularly in regard to how each of any industrial developments, or various combinations of industrial developments, and any infrastructure requirements relate to the viability of the proposal. Should water supply, power, transport and/or storage infrastructure be included as an element of the proposal, this section should include a description of, and rationale for, such infrastructure.

The EIS should describe any prudent and feasible conceptual, technological and locality alternatives to the Project, or specific elements of the Project. The consequences of not proceeding with the Project must be discussed. Alternatives should be discussed in sufficient detail to support the preferred option, including the net effects of all alternatives as justification for the ultimate selection of the preferred option. Compliance with government policy and with the principles and objectives of ecologically sustainable development should be included in this discussion.

1.4 THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

1.4.1 Methodology of the EIS

This section should make clear the objectives of the EIS process under the *SDPWOA*, development approval under the *IPA* and the Environmental Authority approval process under the *EP Act*. This section should include a description of the impact assessment process steps, timing and decisions to be made for relevant stages of the Project.

In particular, this section should outline mechanisms in the process for public input and the public release of an EIS that will specify all responses to stakeholder submissions. This section should further outline the necessity for the Proponents to undertake wide consultation as part of the impact assessment process.

1.4.2 Objectives of the EIS

This section should provide a statement of the objectives of the environmental impact assessment process, detail how the relevant legislation will be addressed and highlight the EIS as the key environmental document for providing advice to decision makers considering approvals for the Project. It should be highlighted that the purpose of the EIS is to:

- provide public information on the need for, and likely effects of the Project;
- set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values; and
- demonstrate how environmental impacts can be managed through the protection and enhancement of the environmental values.

The relationship of other Project environmental management planning documentation, conditions, approvals and environmental authorities should be discussed in relation to the EIS.

1.4.3 Submissions

Interested and affected persons should be made aware of how submissions on the EIS will be addressed and taken into account in the decision-making process. The EIS should inform the reader on:

- how to make submissions;
- what form the submissions should take; and
- when submissions must be made to gain standing for any appeal process.

1.5 PUBLIC CONSULTATION PROCESS

This section should outline the methodology that will be adopted to identify and mitigate environmental, social and socio-economic impacts that may arise from the Project and include details of consultation that has already been undertaken. Details of the consultation process from the planning stages of the Project through construction, commissioning and operation should be included.

The key objectives of the consultation program should be to:

- inform the different interest groups about the Project proposal;
- seek an understanding of interest group concerns about the proposal;
- explain the impact assessment research methodology and how public input might influence the final recommendations for the Project;
- provide an understanding of the regulatory approval process;
- seek local information and input in the Project; and
- provide the community with a sense of ownership in the Project.

The public consultation program should be incorporated into the EIS and provide ongoing opportunities for community involvement, feedback and education. Details should be provided on programs for public meetings, interest group meetings, production of regular summary information and updates and any other consultation mechanisms for encouraging and facilitating active public consultation. A list of affected persons and interested stakeholders, which includes information on consultation with each party, should be included.

1.6 PROJECT APPROVALS AND LEGISLATIVE FRAMEWORK

The aim of this section is to provide the reader with an explanation of the legislation and policies controlling the approvals process for the Project. Reference should be made to the *SDPWOA*, *EP Act*, *IPA*, *VMA*, *Aboriginal Cultural Heritage Act (2004)*, *Water Act 2000*⁴ and other relevant

⁴ DNRM (1)

Queensland Laws. All requirements of the *EPBC Act* and *Native Title Act 1993* should also be included.

The EIS should describe the approvals process resulting from the gazettal of the Project as a 'significant project' pursuant to the *SDPWOA* and outline the linkage to other relevant State and Commonwealth legislation. The EIS should indicate the level of approvals anticipated by the Proponents for each Project element in order for approval agencies to be able to determine the completeness of the information presented and the scope to generate the anticipated approvals.

In addition, local government planning controls, local laws, and policies applying to the Project should be described, and a list of the approvals required for the Project should be provided. A description of the Environmentally Relevant Activities necessary for each aspect of the Project should be given.

2. Description of the Project

The objective of this section is to describe the Project through its lifetime of construction, operation and decommissioning to allow assessment of all aspects of the life of the proposal.

2.1 LOCATION AND GENERAL DESCRIPTION

This section should include a detailed description of the proposed sites including plans of the area in relation to the surrounding features and land uses. Mapping should include details of:

- the location of the facilities in a regional and local context;
- land tenures;
- present land uses and Planning Scheme zonings;
- surrounding industries and other land uses;
- features of State and National environmental significance;
- proposed buffer zones;
- locations and layout of new structures;
- photo images at appropriate scales;
- the Project in the context of the sub-regional transport system; and
- the Project in relation to adjacent infrastructure such as rail and road that illustrate access arrangements.⁵

The EIS should provide details on adjacent areas that could be affected by the Project and existing infrastructure facilities available on, and adjacent to, the site.

2.2 ON SITE OPERATIONS – PROJECT INFRASTRUCTURE

The location and nature of all facilities and the processes involved in all aspects of the Project (coke plant, power station and port handling facilities) should be described and illustrated on maps and flow charts. Concept and layout plans should indicate proposed buildings, structures, plant and equipment associated with the process.

A full description of the facilities should include details of all plant and equipment, processes involved, their capacities, raw materials to be used, all buildings and infrastructure, site access, services access, buffer areas, car parks, landscaping and beautification proposals and site boundaries.

Indicative process flow-sheets should be provided showing material balances, and the anticipated rates of inputs, along with similar data on products, wastes and recycle streams for the coke plant and power station. Additional detail on waste and recycle streams should be included in Section 2.7.

The process and criteria for selecting the facilities should be described and the rationale for the preferred option should be explained.

Information should be provided on the workforce numbers employed, hours of operation, expected life of the operation and the timing for any future expansion proposals. Stages of development should be indicated with proposed plans for each stage, including anticipated dates for start of construction, plant testing and final commissioning.

2.3 CONSTRUCTION

The extent and nature of the Project's construction phase should be described. The description should include:

⁵ DMR (9)

- type and methods of construction to be employed;
- construction timetable, including expected start-up dates, hours of operation and commissioning of plant dates;
- construction equipment to be used;
- materials or plant to be transported onto the construction sites;
- the location of the source/origin of construction materials and the transport mode to be used;⁶
- the extent of surface disturbance; and
- the estimated number of personnel to be employed during the construction phase, including labour histogram.

2.4 PROCESS INPUTS, HANDLING AND STORAGE

This section of the EIS should be directly related to Section 2.2 (On Site Operations – Project Infrastructure) and provide details of the types, sources, quantities, storage and methods of transportation of all materials involved in the coke plant, power station and port facilities. This information should include a brief outline of transport requirements such as proposed routes and methods. Transport requirements are covered in more detail in Section 2.6.1.

The EIS should include details on the nature, sources, location and quantities of all materials to be handled, stored or stockpiled on site, which will be used during modification, construction, installation or operation of the new equipment.

The results of studies and surveys undertaken to identify the natural resources required to implement the proposal should be summarised. The location, volume, tonnage and quality of natural resources required should be described (e.g. land, water, forests, energy).

The EIS should document procedures for loading and unloading materials including contingency plans for spillages. Details of any Project-related hazardous materials to be stored, handled or used in all aspects of the Project should be given (see Section 3.13 for more detailed information on hazards and risks). This information should include:

- the name of the material and sufficient information to clearly identify it, including the chemical name, the UN number and any trade names;
- the classification of the material according to the relevant Australian Dangerous Goods Codes;
- the maximum quantity of the material to be stored on site at any one time;
- the maximum quantity of the material within the process at any one time;
- measures to be employed to minimise the risk of spill and to contain spills; and
- a plan showing the location of the material within buildings and on the site.

2.5 PROCESS OUTPUTS, HANDLING AND STORAGE

The EIS should provide details of the characteristics, quantities, storage locations and methods of transportation of all materials produced by the Project. A brief outline of transport requirements such as proposed tonnages, routes and methods should be included with details covered in Section 2.6.1.

The EIS should document procedures for loading and unloading materials including contingency plans for spillages. Additional detailed information on hazards and risks should be included in Section 3.13.

⁶ DMR (10)

2.6 SUPPORT INFRASTRUCTURE REQUIREMENTS

This section should provide descriptions, with concept and layout plans, of requirements for constructing, upgrading or relocating all infrastructure in the vicinity of the Project area. The matters to be considered should include roads, rail, port facilities, bridges, dams and weirs, power lines and other cables, wireless technology (e.g. microwave telecommunications), and pipelines for any services (whether underground or above).

2.6.1 Transport – Road, Rail and Shipping

The EIS should detail all requirements for the transport of plant, equipment, raw materials, product, wastes and personnel during the construction, operational and decommissioning phases of the Project. The description should address the use of existing facilities and all requirements for the construction, upgrading or relocation of any transport related infrastructure. This information should cover all transportation modes (road, rail and shipping) required for all aspects of the Project and include:

- methods of movement (including transportation type and volume of transport modes likely to be used);
- the volume composition (types and quantities), origin and destination of goods to be moved including construction materials, plant, raw materials, wastes, hazardous materials and finished products;
- anticipated times at which each type of transportation movements may occur;
- the effect on rail freight demand on the Blackwater rail line and the Rockhampton to Gladstone line;
- details of vehicle traffic and transport of heavy and oversize indivisible loads (including types and composition);
- proposed road closures (temporary or permanent);
- the volume of traffic generated by workforce personnel and service vehicles;
- the capacity of existing transport infrastructure to support the additional demand including the impact on level crossings;⁷
- the proposed transport routes;
- the number of ships and their size; and
- any requirements for new transport facilities upgrades (e.g. new access requirements, road safety and passing lanes) and increased maintenance (e.g. including increased maintenance and rehabilitation bring forward costs);⁸ and
- the capacity of the Stanwell intersection (ramp and overpass) to cater for the additional traffic as well as the movement of large items of equipment for the construction of the plant.⁹

The detail should include the need and extent of port facilities required for the Project and the storage and handling arrangements needed to export product coke. Specific shipping requirements should include expected berth duration, the wharf facilities and any issues associated with ship movements within the port.

2.6.2 Energy Requirements

Electricity supply requirements for the construction and operation of the Project should be provided and locations of any associated easements should be shown on an infrastructure plan. Timeframes should be provided for the anticipated dates for the commencement of construction of supply facilities, testing and final commissioning. This section of the EIS should include details on energy demand and annual consumption.

⁷ DMR (12)

⁸ DMR (14)

⁹ DMR (13)

Energy conservation should be described in the context of any Commonwealth, State and local government policies.

2.6.3 Water Supply & Management

The EIS should nominate the proposed and optional sources of water (e.g. bores, any surface storage such as dams and weirs, municipal water supply pipelines, etc) required through construction and operation for all aspects of the Project and quantify the demand for raw and treated water for the various processes. Details on the estimated rates of supply from each source (average and maximum rates) should be included. The following details on daily, seasonal and/or peak operational requirements should be provided:

- quality of water required, including strategies to prevent contamination;
- maximum hourly demand;
- maximum daily demand;
- mean day maximum monthly demand;
- total annual consumption;
- any additional water supply infrastructure; and
- requirements for fire-fighting or other emergency services.

A determination of potable water demand and supply requirements (including source) for each phase of the Project should be made, including existing town water supply to meet such requirements. Any on site water storage and treatment (including sewage) proposals for use by the workforce should be described, including water quality testing and monitoring procedures.¹⁰

An assessment of the capability of the water network to provide the necessary demand should include the following data:

- current and projected raw and treated water consumption;
- current and projected on-site raw and treated water storage;
- contingency plans for planned and non-planned supply failures; and
- projected dates for increased raw and treated water supplies.

The EIS should also consider and nominate the potential use of collected stormwater and all waste/recycled water streams, for example discharge water from the Stanwell Power Station, local sewerage treatment plants (STPs) and STPs operated by Fitzroy River Water.¹¹ This includes an evaluation of the practicality of using treated wastewater from municipal wastewater treatment plants as a water supply source for the various water uses, including any necessary pre-treatment and possible future use.¹²

Any wastewater reuse strategy should refer to the *South Australian Reclaimed Water Guidelines (Treated Effluent)* and the *National Water Quality Management Strategy for Sewerage Systems (Use of Reclaimed Water)*.¹³

The EIS should describe the site layout plans for all aspects of the Project which incorporate requirements and conceptual plans of stormwater management structures, including descriptions of any discharge requirements for both the construction and operational stages. This should include proposals for drainage structures and dams, and an overall site water balance. The topography of the site and adjacent areas should be discussed if any run-off is expected to leave the site.

¹⁰ QH (1)

¹¹ DNRM (3)

¹² EPA (4)

¹³ QH (12)

The EIS should provide volume estimates of industrial and domestic effluent that will be produced and the proposed method of disposal. This should include the physical and chemical characteristics of such effluent. If discharging into an existing sewerage system, an assessment of the capacity of the existing system to accept the effluent should be provided.

The EIS should include details of strategies for conservation, reuse, recycling and efficiency monitoring of water throughout the life of the Project. Any changes in water use in conjunction with industrial neighbours should be described.

2.6.4 Telecommunications

The EIS should provide details of telecommunication requirements, sources and methods, describe any impacts on existing telecommunications infrastructure (such as optical cables, microwave towers, etc) and identify the owners of any existing infrastructure.

2.6.5 Workforce, Accommodation & Support Infrastructure

The EIS should provide information on the number of personnel to be employed and the sources (local, regional and overseas) for the workforce during the construction and operational phases for each aspect of the Project. This information should include an estimate of the anticipated numbers of workers who will be accompanied by dependents, as well as those who will be unaccompanied (i.e. single workers).¹⁴ Estimates should be provided according to skilled and semi-skilled worker categories¹⁵ and expected dates when the workforce requirements will fluctuate for each stage of the Project. Information should include requirements for any offsite workforce requirements and the expected indirect or flow-on effects to be generated.

Details of the construction workforce should be given, with particular reference to the source of skilled tradespeople and labour. An outline of recruitment schedules and policies for recruitment of workers (addressing recruitment of local and non-local workers) should be included. The information should show anticipated peaks in worker numbers during the construction period.

An accommodation strategy for the construction workforce should be included, which addresses the estimated housing needs of both single and accompanied construction workers. This should include details of the size, location and management of any temporary worker accommodation that will be required either on-site or off-site. Maps should be included as necessary to illustrate the site, and should include the location of any proposed construction workers' accommodation on-site or in the vicinity of the Project.¹⁶

An assessment of the accommodation requirements for the workforce should be provided and include the ability of existing facilities in the Gladstone and Rockhampton regions to support workforce fluctuations. Any additional accommodation and social infrastructure requirements to support the workforce should be detailed.

Information provided on workforce camps should include details of potable water (as discussed above in section 2.6.3), facilities provided for food preparation and food storage, ablution facilities, and vector or pest management activities.¹⁷

2.7 WASTE MANAGEMENT

The EIS should provide details of waste management methods which demonstrate that waste minimisation and cleaner production techniques and designs are in keeping with international

¹⁴ DOH (1)

¹⁵ REG (1)

¹⁶ DOH (2)

¹⁷ QH (2)

best practice environmental management¹⁸ and have been implemented through the selection of processes, equipment and facilities to prevent or minimise environmental impacts. This information should include:

- descriptions of processes, equipment and facilities to be incorporated into the overall Project specifically for the purpose of avoiding waste generation, reusing or recycling wastes, or treating wastes to lessen their effect on the natural environment; and
- proposed means for management of wastes produced under circumstances other than as a result of normal Project development, including wastes generated during modification (run-off, chemical cleaning before commissioning), unusual conditions when the facilities are operating (start-up, maintenance, shut-down) and domestic sewage and refuse.

Details on natural resource use efficiency (e.g. energy and water), integrated processing design, co-generation of power and by-product reuse as shown in a material/energy flow analysis should be presented.

2.7.1 Solid and Liquid Wastes

An inventory should be provided of all solid and liquid (including wastewater and sewage) wastes generated by each stage of the Project through construction, operational and maintenance stages, including the characteristics and expected generation rates of each waste.

The management of each waste stream should be described including the handling, storage, treatment and disposal methods. This should include a detailed description of the management, handling and storage of any hazardous or regulated waste materials.

The proposals for waste avoidance, reuse, recycling, treatment and disposal should be described, having regard for international¹⁹ best practice waste management strategies and the *Environmental Protection (Waste Management) Policy 2000 (EPP (Waste))*. Information should also be provided on the variability, composition and generation rates of all waste generated by the Project.

If off site disposal of wastes is to be used, detailed information should be provided (see Section 3.8).

Proposals for management of stormwater to avoid environmental harm, including best practice measures to avoid, minimise, treat and monitor storm water should be detailed, with reference to the requirements of the Environmental Protection (Water) Policy 1997.²⁰

2.7.2 Air & Noise Emissions

The EIS should identify and report all potential release of air pollutants from sources on the Project including but not limited to the coal and coke handling facilities, oven charging and pushing operations, coke quenching and preparation, gas combustion and waste gases exhaust stacks.

Estimation of emission rates from the Project should be based on actual measurements on samples taken from similar facilities, either full-scale facilities operating elsewhere, or experimental or demonstration-scale facilities. Where this is not possible, published emission factors and/or data supplied by manufacturers of process and control equipment should be used.

¹⁸ EPA (1)

¹⁹ EPA (2)

²⁰ EPA (5)

The EIS should provide a complete list of emissions to the atmosphere including SO_x, NO_x, VOC, CO, CO₂, particulates, PM₁₀, PM_{2.5} and toxic/persistent/hazardous substances. The concentrations should be presented at standard temperature and pressure, with the mass emission rate, exit velocity, volume flow rate and temperature at exit provided. The oxygen content of the flue gases should be specified. The proposed level of emission must be compared with the National Health and Medical Research Council *National Guidelines for Control of Emissions from Stationary Sources (1985)* and the best practice international emission standards.

The EIS must identify all expected emissions of the hazardous air pollutants, including dioxins, furans and polycyclic organic matter, from stack and fugitive sources. The EIS should describe the best practice dioxin/furan emission limit that EPA typically applies and the need to comply with the Stockholm Convention on Persistent Organic Pollutants.²¹

Other detailed information requirements for air emissions, to be presented in the EIS, are set down in Section 3.5.2.

A description of noise emissions should be provided and include principal noise sources, any noise abatement measures and expected noise emission levels, including those for routine operations and any atypical circumstances (e.g. descriptions of sound pressure levels at reference distances or sound power levels). The EIS should identify the location of noise emission sources and in particular those which are steady, transient and of low frequency. More detailed information requirements for noise emissions, to be presented in the EIS, are set down in Section 3.7.2.

2.8 DECOMMISSIONING

This section should present the strategies and methods for final closure, decommissioning, and rehabilitation of the coking plant and associated power generation and port facilities.

Decommissioning of the Project, in terms of the removal of plant, equipment, structures and buildings should be described and the methods proposed for the stabilisation of the affected areas should be given.

²¹ EPA (8)

3. Environmental Values & Management of Impacts

This section of the EIS should:

- describe the existing environmental values of the area affected by the proposal through reference to background information and studies;
- describe the potential adverse and beneficial impacts of the proposal on the identified environmental values, including analysis of any cumulative impacts on the environment;
- present environmental protection objectives, standards and measurable indicators; and
- examine viable alternative strategies for managing impacts based on objectives and standards to be achieved through discussion of available techniques and best practice.

The EIS should detail environmental protection measures which are to be incorporated in the planning, construction, operations, decommissioning and associated works for the Project. Measures proposed in the EIS should aim to minimise environmental harm and maximise socio-economic and environmental benefits of the proposal.

Particular attention should be given to strategies for the protection of environmentally sensitive areas or areas of a high conservation value and the requirements of any Commonwealth strategies, State planning policies, local authority planning schemes, environmental protection policies under the *Environmental Protection Act 1994 (EP Act)* and any catchment management plans prepared by local water boards or land care groups.

3.1 LAND CHARACTERISTICS

3.1.1 Description of Environmental Values

This section describes the existing environment values of the land area that may be affected by the Project in the context of environmental values as defined by the *EP Act* and *Environmental Protection Policies (EPP)*. It should also define and describe the objectives and practical measures for protecting or enhancing environmental values, describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

Topography & Geomorphology

Maps should be provided locating the Project and its environs in both regional and local contexts. The topography of the proposal site should be detailed with contours at suitable increments, shown with respect to Australian Height Datum (AHD). Significant features of the landscape and any environmentally sensitive areas or areas of a high conservation value should be included on the maps and discussed.

Geology & Soils

The EIS should provide a description, map and a series of cross-sections of the geology of the Project areas, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of disturbance. Geological properties that may influence: ground stability (including seismic activity, geological faults and associated geological hazards); occupational health and safety; rehabilitation programs; or the quality of wastewater leaving any area disturbed by the proposal should be described.

A description of the soil types and properties should include erosion potential, engineering and structural properties, dispersion characteristics, and permeability. Descriptions should be supported by soil survey data for the area affected by the proposed development. Where no detailed soils information exists, surveys should be conducted at an appropriate scale²² as per Reid, R.E. (1988) *Soil Survey Specifications* in *Australian Soil and Land Survey Handbook* -

²² DNRM (4)

Guidelines for Conducting Surveys (eds. Gunn, R.H., Beattie, J.A., Reid, R.E., van de Graaff, R.H.M) (Inkata Press Melbourne & Sydney).

Landform descriptions and soil profiles should be described according to the *Australian Soil and Land Survey Field Handbook* (McDonald et al, 1990) and *Australian Soil Classification* (Isbell, 1996), and must include horizon differentiation and depths, field texture, colour, mottles, soil structure, erosion hazard rating, pH and electrical conductivity, dispersibility, permeability, attenuation/absorption characteristics and engineering and structural properties.

Details should be provided on any disturbance of soil or sediment to occur at or below plus 5 metres AHD, and which would trigger a detailed acid sulfate soil investigation to assess the potential impact of disturbing acid sulfate soils by excavation, filling, or extracting groundwater. These investigations should be undertaken in accordance with the relevant sections of the *State Planning Policy 2/02 Guideline: Acid Sulfate Soils* in order to comply with the stated outcomes in *State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils*. Site observation density and sampling procedures for the purposes of assessing any acid sulfate soils is to accord with the '*Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland 1998*' (Ahern et al.). Possible strategies (including staged testing) should be discussed with acid sulfate soil specialists from the Department of Natural Resources and Mines (DNRM).

Land Contamination

A description of land known to be contaminated by hazardous substances (such as arsenic, DDT, or oil) which may pose a risk to human health or the environment should be provided. In addition, past land use activities identified as being likely to cause land contamination (e.g. activities listed as 'notifiable activities' in Schedule 2 of the *EP Act*) should be identified and a land contamination assessment provided. Such an assessment should incorporate a Stage 1 preliminary site investigation of the site consistent with Appendix 5 of the EPA's *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*. The results of the preliminary site investigation should be summarised in the EIS and provided in detail in an appendix.

If the results of the preliminary site investigation indicate potential or actual contamination, a Stage 2 detailed site investigation progressively managed in accordance with the stages outlined in Appendix 5 of the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* should be undertaken and reported in the EIS.

Land Use & Tenure

The EIS should provide a description of current land tenures and land uses, including native title issues, in the Project areas, with particular mention of land with special purposes. The location and owner/custodians of native title in the area and details of native title claims should be provided.

Maps at suitable scales showing existing land uses and tenures, and the Project locations, should be provided for the entire Project area and surrounding land that could be affected by the development. The maps should identify areas of conservation value and marine areas in any locality that may be impacted by the proposal. The location of existing dwellings and the zoning of all affected lands according to any existing town planning scheme should be included.

A land suitability map of the proposed and adjacent areas should be provided, setting out land suitability and current land uses (e.g. for grazing of native and improved pastures and horticulture). Land classified as Good Quality Agricultural Land in the DNRM's land classification system is to be shown.

Land use suitability of the affected area should be described in terms of the physical and economic attributes. The potential environmental harm caused by the proposal on the adjacent areas currently used for agriculture, urban development, recreation, tourism, other business and

the implications of the proposal for future developments in the impact area, including constraints on surrounding land uses, should be described.

Infrastructure

The location and owner/custodians of all tenures, reserves, roads and road reserves, railways and rail reserves, stock routes and the like, covering the affected land should be shown. Locations of gas and water pipelines, power lines, port infrastructure and any other easements should also be indicated and the environmental values affected by this infrastructure described.

Sensitive Environmental Areas

The EIS should identify environmentally sensitive areas which could be affected, directly and indirectly, by the Project. In particular, the EIS should indicate if the land affected by the Project is, or is likely to become part of the protected area estate, or is subject to any treaty. Consideration should be given to: national parks; conservation parks; declared fish habitat areas; wilderness areas; aquatic reserves; heritage/historic areas or items; national estates; world heritage listings and sites covered by international treaties or agreements (e.g. Ramsar, JAMBA, CAMBA); areas of cultural significance; and scientific reserves. Vegetation surveys to identify remnant vegetation should also record the occurrence of declared plants (weeds) and show their distribution on maps.²³

The Commonwealth's *EPBC Act* should be referenced in relation to national environmentally significant matters that should be described, including any declared World Heritage property, Ramsar wetland, threatened ecological community or species, migratory species, Commonwealth marine area or Commonwealth land.

Visual Amenity & Scenic Values

This section should provide an outline of the existing visual quality or landscape character of the Project and the surrounding area and its local prominence. The visual amenity and scenic value should be described in terms of the view from places of residence, work, and recreation, from roads, from the air and other known vantage points during the day and night, as it relates to the surrounding landscape.

3.1.2 Potential Impacts & Mitigation Measures

This section of the EIS defines and describes the objectives and practical measures for protecting or enhancing land resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

Land Disturbance & Soil Erosion

A strategy should be developed with a view to minimising the amount of land disturbed at any one time. This section of the EIS should provide information on land disturbance management methods to be used for the proposal, including backfilling, covering, re-contouring, topsoil handling and revegetation, and include:

- topsoil management such as transport, storage, re-use on disturbed areas and storage;
- consideration to the use of threatened plant species during any landscaping and revegetation; and
- erosion and sediment control.

For each area of disturbance identified, erosion potential (wind and water) through the removal of vegetation and erosion management techniques should be outlined. An erosion-monitoring program, including rehabilitation measures for erosion problems identified during monitoring, should also be outlined. Methods proposed to prevent or control erosion should be specified and should be developed with regard to:

²³ DNRM (7)

- preventing soil loss in order to maintain land capability/suitability;
- reducing wind-generated dust concentrations; and
- preventing significant degradation of local waterways by suspended solids.

Where dams, roads and other infrastructure are to be constructed, proposals for the management of these structures after the completion of the proposal should be given. A contour map of the area should be provided and the final drainage and seepage control systems and any long-term monitoring plans described.

Methods used and release limits for any suspended solids must be based on implementation of best practice erosion and sediment control guidelines, in particular, *Soil Erosion and Sediment Control - Engineering Guidelines for Queensland Construction Sites*.²⁴

Land Contamination Potential

The EIS should describe the possible contamination of land from aspects of the proposal including waste, product, and spills at chemical and fuel storage areas. The means of preventing land contamination (within the meaning of the *EP Act*) should be addressed and methods proposed for preventing, recording, containing and remediating any contaminated land outlined. Intentions should be stated concerning the classification (in terms of the Queensland Contaminated Land Register) of land contamination on the land, processing plant site and product storage areas after proposal completion.

Land Use Suitability

The potential for the construction and operation stages of the Project to change existing and potential land uses of the proposal site and adjacent areas should be detailed. Post operations land use options should be detailed including suitability of the area to be used for agriculture, industry, or nature conservation. The factors favouring or limiting the establishment of those options should be given in the context of land use capability or suitability prior to the proposal and minimising potential liabilities for long-term management.

Existing or potentially incompatible land uses adjacent to all aspects of the Project should be highlighted. Essential and proposed ancillary developments or activities and areas directly or indirectly affected by the construction and operation of these activities should be identified and measures to avoid unacceptable impacts defined.

Visual Amenity & Scenic Values

This section should provide an outline of the resulting visual quality/landscape character of the Project and the surrounding area and its local prominence. Detail should be provided on the impact of the intended proposal design.

The visual impact, in terms of the extent and significance of the changed skyline as viewed from places of residence, work, and recreation, from roads, from the air and other known public vantage points day and night, during all stages of the Project as it relates to the surrounding landscape is to be analysed and discussed. The assessment will address the local and broader visual impacts of the Project structures and associated infrastructure.

Lighting

An assessment of all potential impacts of lighting of the Project, during all stages of construction and operation, is to be provided, with particular reference to:

- the visual impact at night;
- night operations/maintenance and effects of lighting on fauna, flora and residents;
- the potential impact of increased vehicular traffic;

²⁴ EPA (6)

- affected industry and businesses;²⁵ and
- changed habitat conditions for nocturnal fauna and associated impacts.

Decommissioning

The strategies and methods for the rehabilitation of the environment disturbed by the Project and related activities should be described in the context of the expected final landform and potential final land uses.

The means of decommissioning the Project, in terms of removal of plant, equipment, concrete footings and foundations, hardstand areas, storage tanks, wharfage (including any potential for reuse of these facilities) and buildings should be described. The methods proposed for the stabilisation of the affected areas should be given. Final rehabilitation of the plant site should be discussed in terms of ongoing land use suitability, management of any residual contaminated land and other land management issues.

A rehabilitation strategy should be developed with a view to minimising the amount of land disturbed at any one time. The strategic approach to progressive and final rehabilitation should be described.

Where dams are to be constructed, proposals for the management of these structures after the completion of the Project should be given. Also, the final drainage and seepage control systems and long-term monitoring plans should be described.

3.2 CLIMATE

This section should describe the rainfall patterns (including magnitude and seasonal variability of rainfall), air temperatures, humidity, wind (direction and speed) and any other special factors (e.g. temperature inversions) that may affect air quality within the environs of the proposal. Extremes of climate (droughts, floods, cyclones, etc) should also be discussed with particular reference to water management at the Project site. The vulnerability of the area to natural or induced hazards, such as floods and bushfires, should also be addressed. The relative frequency, magnitude and risk of these events should be considered. More detailed information on hazards and risks is to be provided in Section 3.13.

3.3 WATER RESOURCES

3.3.1 Description of Environmental Values

Surface Water

The EIS should provide a description of existing surface water features and their quality and quantity in the area affected by the Project with an outline of the significance of these waters to the river catchment system in which they occur. Details should include a description of:

- existing surface drainage patterns;
- flows in major streams and wetlands;
- current discharge of wastewater from Stanwell Power Station to Neerkol Creek and other downstream creeks;²⁶
- seasonal variations;
- physical, chemical and biological parameters;
- the topography and likelihood of flooding;
- the level of flood immunity to be conferred upon the new plant and how the new structures will prevent the intrusion of floodwaters;
- history of flooding including extent, levels and frequency; and

²⁵ QH (4)

²⁶ DNRM (9)

- present and potential water uses downstream;

The EIS should detail baseline information on seawater quality, including heavy metals, acidity, turbidity and oil in water at the proposed port site. The interaction of site runoff flows with marine waters and its significance in relation to marine flora and fauna adjacent to the proposed materials handling, storage and transport area at Gladstone should be described.

The environmental values of the surface waterways of the affected area should also be described in terms of:

- values identified in the *Environmental Protection (Water) Policy 1997 (EPP (Water))*;
- sustainability, including both quality and quantity;
- any regional coastal plan and state coastal management plan;
- physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form; and
- any water resource plans, land and water management plans relevant to the affected catchment.

Groundwater

The EIS should review the quality, quantity and significance of groundwater in the Project area, together with groundwater use in neighbouring areas. Data should be provided on surveys of existing groundwater supply facilities (bores, wells, or excavations) and include:

- location;
- pumping parameters;
- draw down and recharge at normal pumping rates; and
- seasonal variations (if records exist) of groundwater levels.

The data obtained from the groundwater surveys should be sufficient to enable specification of the major ionic species present in the groundwater, pH, electrical conductivity and total dissolved solids.

The EIS should provide a description of groundwater resources in terms of:

- geology/stratigraphy - such as alluvium, volcanic, metamorphic;
- aquifer type - such as confined, unconfined;
- depth to and thickness of the aquifers;
- depth to water level and seasonal changes in levels;
- groundwater flow directions (defined from water level contours);
- interaction with surface water;
- interaction with sea/salt water;
- possible sources of recharge; and
- vulnerability to pollution.

The environmental values of the underground waters of the affected area should be described in terms of:

- values identified in the *EPP (Water)*;
- sustainability, including both quality and quantity; and
- physical integrity, fluvial processes and morphology of groundwater resources.

3.3.2 Potential Impacts & Mitigation Measures

This section should also define and describe the objectives and practical measures for protecting or enhancing water (including coastal) resource environmental values, to describe

how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

Surface Water

An assessment should be made of the potential impacts the proposed Project may have on the flow and the quality of surface waters from all phases of the Project, with particular reference to their suitability for the current and potential downstream uses and current discharge licences. The impacts of surface water flow on existing infrastructure should be considered in reference to the *EPP (Water)* and *Water Act 2000*.

If it is proposed to utilise discharge water from the Stanwell Power Station, an assessment of the potential impacts of reduced water flow in Neerkol Creek and other downstream creeks should be undertaken.²⁷

The potential environmental harm caused by the proposal on coastal resources and processes should be described in the context of controlling such effects. The *State Planning Policy – Planning and Managing Development Involving Acid Sulfate Soils 2002* should be addressed as should the *State Coastal Management Plan 2001* and Department of Primary Industries and Fisheries Guidelines for Marine Areas.

Quality characteristics discussed should be appropriate to the downstream, upstream and coastal water uses that may be affected. Chemical and physical properties of any waste water at the point of discharge into natural surface waters should be discussed, including the toxicity of effluent to flora and fauna.

Reference should be made to the properties of the disturbed land and process wastes and the techniques to be employed to ensure that contaminated water is contained and successfully treated on site.

An assessment of impacts on the flow and the quality of surface waters and effects on ecosystems should include an assessment of the likely effects on mangrove and other estuarine habitats.

In relation to water supply, usage and wastewater disposal, the EIS should assess:

- anticipated flows of water to and from the Project area;
- investigate the effects of predictable climatic extremes (droughts, floods) upon the structural integrity of containment walls where dams, weirs or ponds are proposed;
- quality of water contained in dams;
- flows and quality of water discharged;
- the use of the site water management technical guidelines in the design of all water storage facilities;
- whether such a water supply will be sourced via water trading or taking of unallocated water as identified in the *Fitzroy Basin Resource Operations Plan (January 2004)*;²⁸ and
- the need or otherwise for licensing any dams (including referable dams), under the *Water Act 2000*.

The EIS should include the results of a risk assessment for uncontrolled releases to water due to system or catastrophic failure, implications of such emissions for human health and natural ecosystems, and list strategies to prevent, minimise and contain impacts.

The relevant standards and indicators mentioned in the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality, (2000)* prepared under the *National Water Quality Management Strategy* should be used as a reference when assessing surface water impacts.²⁹

²⁷ DNRM (10)

²⁸ DNRM (11)

Management strategies should be adequately detailed to demonstrate best practice management and that environmental values of receiving waters will be maintained to nominated water quality objectives.

Monitoring programs, which will assess the effectiveness of management strategies for protecting water quality during the construction, operation and decommissioning of the Project, should be described.

Groundwater

The EIS should include an assessment of the potential environmental harm caused by the proposal to local groundwater resources. The impact assessment should define the extent of the area within which groundwater resources are likely to be affected by the proposed operations and the significance of the Project to groundwater depletion or recharge, and propose management options available to monitor and mitigate any effects.

An assessment should be undertaken of the impact of the Project on the local ground water regime caused by the altered porosity and permeability of any land disturbance.

An assessment of the potential to contaminate groundwater resources and measures to prevent, mitigate and remediate such contamination should be discussed.

3.4 NATURE CONSERVATION

3.4.1 Description of Environmental Values

This section describes the existing environment values for nature conservation that may be affected by the proposal in the context of environmental values as defined by the *EP Act* and *EPP*, the *VMA*³⁰ and the *Nature Conservation Act 1992 (NCA)*.

The EIS should provide descriptions of the environmental values of nature conservation for the affected area in terms of:

- integrity of ecological processes, including habitats of rare and threatened species;
- conservation of resources;
- biological diversity, including habitats of rare and threatened species;
- integrity of landscapes and places including wilderness and similar natural places;
- aquatic and terrestrial ecosystems;
- remnant native vegetation; and
- conservation status of regional ecosystems.³¹

Key flora and fauna indicators should be identified for future ongoing monitoring.

Terrestrial Flora

Terrestrial vegetation mapping at a suitable scale (i.e. 1:10,000) should be provided, with descriptions of the units mapped. Vegetation mapping should include all relevant Project sites including new transport infrastructure and port facilities. Mapping should be derived from aerial photographs and ground truthing and indicate the following:

- the location and extent of vegetation types using the EPA's regional ecosystem type descriptions in accordance with *The Conservation Status of Queensland's Bioregional Ecosystems* (Sattler P.S., & Williams R.D., 1997) and the EPA's web site listing the conservation status of regional ecosystems;

²⁹ EPA (7)

³⁰ DNRM (7)

³¹ DNRM (12)

- the location of vegetation types of conservation significance based on EPA's regional ecosystem types and occurrence of species listed as Protected Plants under the *Nature Conservation (Wildlife) Regulation 1994* and subsequent amendments, as well as remnant vegetation³² subject to the *VMA*;
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected area estate (national parks, conservation parks, resource reserves, nature refuges etc); and
- the location and abundance of any exotic or weed species.

Sensitive or important vegetation communities should be highlighted, including any marine littoral and sub-tidal zone and riparian vegetation, and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types.

The existence of rare or threatened species should be specifically addressed in the EIS.

Vegetation survey data should include species structure, assemblage, diversity and abundance.

Within each defined (standard system) vegetation community, a minimum of three sites should be surveyed for plant species, as follows:

- site data should be recorded in a form compatible with the Queensland Herbarium CORVEG database;
- the minimum site size should be 10 by 50 metres;
- a complete list of species present at each site should be recorded;
- the relative abundance of plant species present should be recorded;
- any plant species of conservation, cultural, commercial or recreational significance should be identified; and
- specimens of species listed as *Protected Plants under the Nature Conservation (Wildlife) Regulation 1994*, other than common species, are to be submitted to the Queensland Herbarium for identification and entry into the HERBRECS database.

Existing information on plant species may be used instead of new survey work provided that the data is derived from surveys consistent with the above methodology. Methodology used for flora surveys should be specified in the appendices to the report.

Terrestrial Fauna

The terrestrial and riparian fauna occurring in the areas affected by the Project should be described, noting the broad distribution patterns in relation to vegetation, topography and substrate. The description of the fauna present or likely to be present in the area should include:

- species diversity (i.e. a species list) and abundance of animals, including amphibians, birds, reptiles, mammals and bats;
- any species that are poorly known but suspected of being rare or threatened;
- habitat requirements and sensitivity to changes; including movement corridors and barriers to movement;
- the existence of feral or exotic animals;
- existence of any listed rare, threatened or otherwise noteworthy species/communities in the study area, including a discussion of range, habitat, breeding, recruitment, feeding and movement requirements, and current level of protection (e.g. any requirements of Protected Area Management Plans); and
- use of the area by migratory birds, nomadic birds, fish and terrestrial fauna.

The EIS should indicate how well any affected communities are represented and protected elsewhere in the province where the Project site occurs.

³² DNRM (13)

Aquatic Biology

The aquatic flora and fauna occurring in the areas affected by the proposal should be described, noting the patterns and distribution in the waterways and/or associated marine environments. The description of the fauna and flora present or likely to be present in the area should include:

- fish species, mammals, reptiles, amphibians, crustaceans and aquatic invertebrates occurring in the waterways within the affected area, and/or those in any associated marine environment;
- any listed rare or threatened marine species, particularly the dugong and its habitat;
- aquatic plants;
- aquatic and benthic substrate; and
- habitat downstream of the Project or potentially impacted due to currents in associated lacustrine and marine environments.

3.4.2 Potential Impacts & Mitigation Measures

This section should define and describe the objectives and practical measures for protecting or enhancing nature conservation environmental values, how nominated quantitative standards and indicators may be achieved for nature conservation management and how the achievement of the objectives will be monitored, audited and managed.

The discussion should cover all likely direct and indirect environmental harm to flora and fauna, particularly sensitive species and communities including:

- important habitats of species listed under the *NCA* and/or *EPBC Act* as presumed extinct, endangered, vulnerable or rare;
- regional ecosystems recognised by the EPA as 'endangered' or 'of concern' and/or 'not of concern' regional ecosystems as recognised by the EPA and defined in the *VMA* as remnant vegetation;³³
- good representative examples of remnant regional ecosystems or regional ecosystems which are poorly represented in protected areas;
- sites listed under international treaties such as RAMSAR wetlands and World Heritage areas;
- sites containing near threatened or bio-regionally significant species or essential, viable habitat for near threatened or bio-regionally significant species;
- sites in, or adjacent to, areas containing important resting, feeding or breeding sites for migratory species of conservation concern listed under the Convention of Migratory Species of Wild Animals, and/or bilateral agreements between Australia and Japan (JAMBA) and between Australia and China (CAMBA);
- sites containing common species which represent a distributional limit and are of scientific value or which contain feeding, breeding, resting areas for populations of echidna, koala, platypus and other species of special cultural significance;
- sites containing high biodiversity that are of a suitable size or with connectivity to corridors/protected areas to ensure survival in the longer term;
- sites containing other special ecological values, for example, high habitat diversity and areas of high endemism;
- ecosystems which provide important ecological functions such as: wetlands of national, state and regional significance; coral reefs; riparian vegetation; important buffer to a protected area or important habitat corridor between areas;
- protected areas which have been proclaimed under the *NCA* and *Marine Parks Act 1982*, or are under consideration for proclamation; and
- areas of major interest, or critical habitat declared under the *NCA* or high nature conservation value areas or areas vulnerable to land degradation under the *VMA*.

³³ DNRM (14)

Strategies for protecting World Heritage Properties, and any listed rare or threatened species should be described, and any obligations imposed by State or Commonwealth legislation or policy or international treaty obligations (i.e. JAMBA, CAMBA) should be discussed. Emphasis should be given to potential environmental harm to benthic and intertidal communities, seagrass beds and mangroves.

The potential environmental harm to the ecological values of the area arising from the construction, operation and decommissioning of the Project including clearing, salvaging or removal of vegetation should be described, and the indirect effects on remaining vegetation should be discussed. Short-term and long-term effects should be considered with comment on whether the effects are reversible or irreversible. Mitigation measures and/or offsets should be proposed for adverse impacts. Any departure from no-net-loss of ecological values should be described.

The potential environmental harm on flora and fauna of any alterations to the local surface and ground water environment should be discussed with specific reference to environmental harms on riparian vegetation or other sensitive vegetation communities. Measures to mitigate the environmental harm to habitat or the inhibition of normal movement, propagation or feeding patterns, and change to food chains should be described.

The provision of buffer zones and movement corridors, and strategies to minimise environmental harm on migratory, nomadic and aquatic animals should be discussed.

Weed control strategies aimed at containing existing weed species (e.g. parthenium and other noxious weeds) and ensuring no new invasive weeds are introduced to the area should be described. Reference should be made to the local authorities' pest management plans when determining control strategies.

Rehabilitation of disturbed areas should incorporate provision of nest hollows and ground litter, where appropriate.

3.5 AIR

3.5.1 Description of Environmental Values

A description of the existing air shed environment should be provided having regard for particulates and gaseous and odorous compounds. The background levels and sources (including the existing power station) of suspended particulates, SO_x, NO_x, CO₂ and any other major constituent of the existing air environment which may be affected by the proposal should be discussed.

Sufficient data on local meteorology and ambient levels of pollutants should be gathered to provide a baseline for later studies or for the modelling of air quality environmental harms within the air shed. Parameters should include air temperature, wind speed and direction, atmospheric stability, mixing depth and other parameters necessary for input to the models.

The environmental values of the air shed for the affected area should be described in terms of the *Environmental Protection (Air) Policy 1998 (EPP(Air))*.

3.5.2 Potential Impacts & Mitigation Measures

The EIS should describe local and regional climatic and meteorological factors affecting air quality impacts. An examination of the effects of adverse conditions (e.g. inversions) and mixing heights on air quality impacts should be provided. The potential for interaction between the emissions from the coke plant and the existing power station, and emissions in the air shed, and the likely environmental harm from any such interaction, should also be detailed.

The EIS should include an impact assessment with relevant inputs of emissions and local meteorology to an air dispersion model to provide estimates of the likely impacts on the surrounding environment. The model inputs should be as detailed as possible, reflecting any variation of emissions with time and including at least a full year of representative hourly meteorological data. Ground level concentration at the nearest sensitive receptor(s) based on 1-hour average for maximum (99.9 percentile) and 99.5 percentile values should be estimated. Results of the dispersion modelling must be presented as concentration contour plots and frequency contour plots.

The model input parameters must be based on the actual stack conditions proposed by the Proponent for the Development Approval conditions. The Proponent must provide stack parameters such as diameter, temperature, exit velocity and volume flow rate.

The EIS should identify 'worst case' emissions that may occur at start-up, shut-down or during other 'upset' operating conditions. If these emissions are significantly higher than those for normal operations, the EIS should evaluate the worst-case odour impact, as a separate exercise to determine whether the planned buffer distance(s) between the facility and neighbouring sensitive receptors would be adequate. The odour impact assessment should conform to the criteria described in the Queensland EPA Guideline on *Odour Impact Assessment from Developments*.

The averaging period for ground level concentrations of pollutants that are modelled should be consistent with the relevant averaging periods for air quality indicators and goals in the *Environmental Protection Policy (Air) 1997* and the National Environmental Protection Measure (NEPM) Air. For example, the modelling of sulphur dioxide must be conducted for 10-minutes, 1-hour, 24-hours and annual averaging periods.

Modelled concentration levels at the "most exposed existing or likely future sensitive receptors" must be compared with the appropriate national and international ambient air quality standards.

The EIS should describe proposed back-up measures in the event of failure of primary measures to minimise the likelihood of plant upsets and adverse air impacts.³⁴

The assessment of the Project's impact on air quality should consider the following matters:

- the extent to which NO_x and volatile hydrocarbon emissions from the Project and existing emission sources within the region will contribute to the generation of photochemical smog;
- the extent to which SO_x emissions from the Project and existing emission sources within the region will contribute to the generation of acid rain or acidification of other atmospheric condensation, such as dew;
- the human health risk associated with emissions from the facility;
- the potential for the Project to generate a dust nuisance during and after construction;
- the potential for the Project to generate a dust nuisance during the operational phase of the Project as a result of any proposed new or upgraded rail operations and/or infrastructure (e.g. from loaded wagons and empty wagons with residual product, or locomotives) - this pertains to the loading/unloading sites and the entire haul route (i.e. from the core project site to the export site of the Project);³⁵
- the potential for odour impacts and an assessment of the overall odour nuisance potential;
- records of any complaints made in the area regarding air quality;

³⁴ EPA (9)

³⁵ QR (3)

- Project technology and Project emission control systems designed to suppress or minimise emissions, including dusts, gases and odours;³⁶
- air quality aspects for forecast emissions derived from other similar projects;
- existing environmental approvals for Stanwell Power Station and any relevant strategies and agreements (such as the National Greenhouse Strategy);
- air shed management and the contribution of the proposal to air shed capacity in view of existing and future users of the air shed for assimilation and dispersion of emissions; and
- the extent to which air emissions will impact on water quality following deposition locally and within the greater Fitzroy basin.³⁷

Where there is no single atmospheric dispersion model that is able to handle the different atmospheric dispersion characteristics exhibited in the proposal area (i.e. sea breezes, strong convection, terrain features, temperature inversions and pollutant re-circulation), a combination of acceptable models will need to be applied. The limitations and accuracy of the dispersion models used for calculating ground level concentrations and a sensitivity analysis of each model to variations in the input parameters should be discussed.

3.6 GREENHOUSE GAS EMISSIONS

Greenhouse Gas Emissions should be described in the context of relevant protocols and agreements including:

- an inventory of projected future annual emissions for each Greenhouse Gas, both on-site and off-site, attributable to the Project, and for each component of the Project³⁸ expressed as total mass CO₂ equivalents per annum and, if possible, as a percentage of Queensland's and Australia's annual greenhouse gas emissions;
- the intended measures to avoid, minimise or offset greenhouse emissions, including any sink-enhancement activities;
- an analysis of comparable technologies, processes and equipment to demonstrate the degree to which the selected option minimises emissions;
- an identification of accountabilities; and
- intended audit and critical review procedures.

3.7 NOISE & VIBRATION

3.7.1 Description of Environmental Values

The EIS should describe the existing environmental values that may be affected by noise and vibration from Project activities.

If Project activities could adversely impact on the noise environment, baseline monitoring should be undertaken at a selection of noise sensitive sites affected by the proposal. Noise sensitive places in relation to the Project should be identified on a map at a suitable scale. Long-term measured background noise levels should take into account seasonal and meteorological variations. The results of any baseline monitoring of noise and vibration in the proposed vicinity of the proposal should be described.

Sufficient data should be gathered to provide a baseline for later studies. The daily variation of background noise levels at nearby sensitive sites should be monitored and reported in the EIS, with particular regard given to detailing variations at different periods of the day and night. Monitoring methods should adhere to relevant EPA Guidelines and Australian Standards, and any relevant requirements of the *Environmental Protection (Noise) Policy 1997 (EPP (Noise))*.

³⁶ EPA (10)

³⁷ DNRM (15)

³⁸ EPA (12)

Comment should be provided on any current activities near the Project area that may cause a background level of noise and ground vibration (e.g. existing power station, railway, major roads, etc).

3.7.2 Potential Impacts & Mitigation Measures

Information, including mapped noise contours from a suitable acoustic model, should be submitted on the proposed generation of noise. The potential environmental harm of noise and vibration at all potentially sensitive places, in particular, any place of work or residence should be quantified in terms of objectives, standards and indicators to be achieved. This should also include environmental harm on terrestrial and marine animals and avifauna, particularly migratory species.

An estimate should be made of the cumulative noise level at the boundaries of the sites of the Project and at the boundaries of existing and future land uses likely to be affected by noise from the Project. This estimate should include noise from construction, operation and from transport movements, and include sources of low frequency noise such as fans, compressors, furnaces, stack exhausts and elevated cyclones. Noise assessments should be made with reference to the EPA Guideline, *“Planning for Noise Control”*, and the draft guideline *“Assessment of Low Frequency Noise”*.³⁹

Proposals for buffers to minimise or eliminate these effects including details of any screening, buffers, insulation, or enclosures should be provided. Timing schedules for construction and operations should be discussed with respect to minimising the environmental impacts from noise.

Off-site transport noise and vibration factors due to road and rail should be described and include a discussion on existing speed zones, scheduled transport movements and industry.

3.8 WASTE IMPACTS

This section should complement other items outlined in Section 3 of the ToR by providing technical details of waste treatment, minimisation and management, with proposed emission, discharge and disposal criteria, comparing these against international best practice environmental management.⁴⁰ Reference should be made to each of the waste streams described in Section 2.7 and to environmental values described in Section 3 of the ToR.

This section should assess the potential impact of all wastes to be generated and provide details of each waste in terms of:

- the type and amount of wastes produced;
- collection, handling and fate of all wastes including storage;
- the separation of wastewater from solid waste;
- on-site treatment methods proposed for the wastes;
- methods of disposal (including the need to transport wastes off-site for disposal) proposed to be used for any trade wastes, liquid wastes and solid wastes;
- the potential level of impact on environmental values;
- proposed disposal criteria for liquid and solid wastes;
- methods to prevent seepage and contamination of groundwater from stockpiles;
- market demand for recyclable waste (where appropriate);
- opportunities for waste avoidance and minimisation techniques; and
- international best practice environmental management for the waste.⁴¹

³⁹ EPA (11)

⁴⁰ EPA (3)

⁴¹ EPA (3)

Where solid (or liquid) wastes are to be disposed of, off site the following details should be provided:

- the name and location of the facility to which each waste will be sent for disposal;
- confirmation from each facility that it will accept the type, concentration and quantity of the nominated wastes;
- an assessment that the proposed facilities are capable of accepting this waste without creating an adverse environmental impact; and
- details that the transport of the wastes from the plant to the disposal facility will comply with all requirements of the relevant acts governing the transport of hazardous wastes.

The EIS should indicate the results of investigation into the feasibility of using waste minimisation and cleaner production technology options during the construction and operating phases of the proposal, having regard for the *Environmental Protection (Waste Management) Policy 2000 (EPP (Waste))* and its guidelines, and international best practice environmental management.⁴²

The EIS should present the methods to avoid stormwater contamination by raw materials, wastes or products and present the means of containing, recycling, reusing, treating and disposing of stormwater, having regard for the requirements of the *EPP (Water)*. Where no-release water systems are to be used, measures to minimise any accidental release or the likelihood of such a release should be described and the fate of salts and particulates in release water should be discussed.

Stormwater management should also address the following:

- nominated stormwater discharge points and discharge criteria;
- design criteria, diversions, volume and capacity of any retention ponds, process tanks or bunded areas, as well as those reasonable and practicable measures proposed to prevent the likely release of contaminated stormwater to any drain or waters;
- potential impacts during extreme rainfall events;
- details of contaminants in controlled discharges of wastewater and stormwater (e.g. chemical composition, particulates, metals, effluent temperature and pH), proposed management systems and impacts of discharges on all potential receiving waters;
- effects on the downstream environment of stormwater releases; and
- information on the collection, treatment and disposal of contaminated stormwater runoff from the plant and associated materials handling facilities at Stanwell and Gladstone.

Waste minimisation and treatment, and the application of cleaner production techniques, should also be applied to gaseous wastes, particularly NO_x, SO₂, CO₂ and particulates. Particular attention should be paid to measures that will maximise energy efficiency and minimise internal energy consumption in the proposal.

Cleaner production waste management planning should be detailed, especially as to how these concepts have been applied to preventing or minimising environmental impacts at each stage of the Project. Details on natural resource use efficiency (e.g. energy and water), integrated processing design, co-generation of power and by-product reuse as shown in a material/energy flow analysis should be presented.

3.9 CULTURAL HERITAGE

3.9.1 Description of Environmental Values

The EIS should describe the existing cultural heritage values that may be affected by the Project including all supporting infrastructure.⁴³

⁴² EPA (3)

⁴³ DNRM (16)

A cultural heritage study should be undertaken to describe Indigenous and non-Indigenous⁴⁴ cultural heritage sites and places, and their values. The Indigenous component of the study must be conducted by the appropriate Aboriginal Party and/or an appropriately qualified cultural heritage practitioner, in accordance with the *Aboriginal Cultural Heritage Act 2003 (ACH Act)*. Non-Indigenous cultural heritage is administered under the *Queensland Heritage Act 1992*.

The study should include:

- consultation with:
 - the Register of the National Estate (maintained by the Australian Heritage Commission);
 - the Queensland Heritage Register (maintained by the EPA);
 - the Aboriginal and Torres Strait Islander Database (maintained by the DNRM);⁴⁵
 - any local government heritage register; and
 - any existing literature relating to the affected areas;
- liaison, in accordance with the requirements of the *ACH Act*, with the Aboriginal party for the area concerning:
 - places of significance (including archaeological sites, natural sites, story sites etc); and
 - appropriate involvement in field surveys;
- a systematic survey of the proposed development area to locate and record Aboriginal cultural heritage and non-Indigenous cultural heritage places; and
- a report of work done, which includes background research, relevant environmental data and methodology, as well as results of field surveys, and recommendations (having due regard for any confidentiality requirements specified by community representatives).

Cultural heritage surveys previously undertaken in the area should be described and the findings stated.

The EIS should identify all Native Title claims and associated issues within the Project area.⁴⁶

3.9.2 Potential Impacts & Mitigation Measures

Potential environmental harm to Indigenous cultural heritage values in the vicinity of the Project will be managed under a cultural heritage management plan (CHMP) developed in consultation with the traditional owners specifically for the Project in accordance with the *ACH Act*. The CHMP will provide a process for the management of cultural heritage items and places. It is usual practice for the CHMP to be based on information contained in archaeological and/or anthropological reports on the survey area and cultural reports and/or information from affiliated traditional owners. The CHMP should address and include the following:

- a process for including Aboriginal people associated with the development areas in protection and management of Indigenous cultural heritage;
- processes for mitigation, management and protection of identified cultural heritage places and material in the Project areas, including associated infrastructure developments, both during the construction and operational phases of the Project;
- provisions for the management of the accidental discovery of cultural material, including burials;
- the monitoring of foundation excavations and other associated earthwork activities for possible sub-surface cultural material;
- cultural awareness training or programs for Project staff; and
- a conflict resolution process.

⁴⁴ DATSIP (2)

⁴⁵ DNRM (17)

⁴⁶ DATSIP (8)

The EIS should describe potential impacts on Native Title rights and interests in relation to the Project.⁴⁷

3.10 SOCIAL ENVIRONMENT

3.10.1 Description of Environmental Values

The amenity and use of the proposal area and adjacent areas for rural, agricultural, forestry, fishing, recreational, industrial, educational or residential purposes should be described through consideration of:

- community infrastructure and services, access and mobility;
- population and demographics of the affected community (including size, age structure, gender composition, education level, residency, labour force and unemployment rates);
- local community values, vitality and lifestyles;
- recreational, cultural, leisure and sporting facilities and activities in relation to the affected area;
- health, emergency services and educational facilities;
- on-farm activities near the proposed activities;
- current property values;
- number of properties directly affected by the Project; and
- number of families directly affected by the Project, including families of workers either living on the property or workers where the property is their primary employment.

The social values for the affected area should be described in terms of:

- the integrity of social conditions, including amenity and liveability, sense of community, access to recreation, and access to social and community services and infrastructure.; and
- public health and safety (refer to Section 3.13).

Information should also be provided on the existing housing market, with an emphasis on:

- the size of the private rental market in the area;
- the vacancy rate of rental accommodation, including assessment of seasonal fluctuations;
- typical rents for the area;
- the availability and typical cost of housing for purchase in the area;
- the level of social housing in the area; and
- constraints and opportunities for new housing construction in the area, including the capacity of the local land development and housing construction industries to provide new housing.

3.10.2 Potential Impacts & Mitigation Measures

This section aims to define and describe the objectives for protecting or enhancing social values, and how the achievement of the objectives will be monitored, audited and managed.

The social impact assessment of the Project should consider the information gathered in the community consultation program and the analysis of the existing socio-economic environment, and describe the Project's impact, both beneficial and adverse, on the local community. The impacts of the Project on local and regional residents, community services and recreational activities are to be analysed and discussed for all stages of the development. The nature and

⁴⁷ DATSIP (8)

extent of the community consultation program are to be described and a summary of the results incorporated in the EIS.

The assessment of impacts should describe the likely response of affected communities and identify possible beneficial and adverse impacts (both immediate and cumulative). These impacts should be considered both at the regional and local level.

Attention should be paid to:

- impacts on demographic, social, cultural and economic profiles;
- impacts on local residents, current land uses and existing lifestyles and enterprises;
- impacts on affected and adjoining landowners/occupiers resulting from any land resumption;⁴⁸
- impacts (including potential demand) on health care services and providers (public and private) located in the vicinity of the proposed development;⁴⁹
- impacts on local and state labour markets, with regard to the source of the workforce with the information presented according to occupational groupings of the workforce;
- impacts of both the construction and operational workforces and associated contractors on housing demand, community services and community cohesion;
- how much household income and jobs from the Project (e.g. provisioning, catering and site maintenance) would be likely to flow to existing communities in the area of the Project; and
- impacts on local residents values.

An assessment of the predicted impacts of the Proponent's activities (including activities by any sub-contractors) on the local and regional housing markets should also be undertaken. The assessment should refer to the projected accommodation needs for the Project in both the construction and operational phases, and estimate:

- the capacity of local and regional housing markets to meet the accommodation needs of the Project, including the potential displacement of low-income residents from affordable rental accommodation and diminished availability of accommodation;
- any possible cumulative impacts on the local and regional housing market due to the presence of other existing or proposed major projects in the area, and seasonal employment factors; and
- the impact of the construction phase of the proposal on the local and regional residential development and housing construction industry, with particular reference to the demand for local contractors.

In regard to affected Indigenous and non-Indigenous communities respectively, particular attention should be paid to the effects on:

- the ability of both Indigenous and non-Indigenous people, to live in accordance with their own values and priorities;
- the access to existing human and commercial services and housing;
- the ability to participate in regional and local employment and training opportunities; and
- the new Project workforce and their families.

The potential environmental harm on the amenity of adjacent areas used for cropping, grazing, forestry, recreation, industry, education, aesthetics, scientific or residential purposes should be discussed in relation to impacts on social values. The implications of the Project for future developments in the local area including constraints on surrounding land uses should be described.

⁴⁸ QH (15)

⁴⁹ QH (13)

The educational impact of the proposed development should be analysed and described, particularly in regard to:

- primary, secondary and tertiary educational sectors; and
- environmental education for the general public.

For identified impacts on social values, proposed mitigation and enhancement strategies should be described, and approaches to facilitate initial negotiations towards community acceptance of these strategies identified. Practical monitoring regimes should also be discussed.

3.11 ECONOMIC ENVIRONMENT

3.11.1 Description of Environmental Values

This section should describe the existing economic environment that may be affected by the proposal. The character and basis of the local and regional economies should be described including:

- economic opportunities, including existing economic base and economic activity, potential economic opportunities, and current local and regional economic trends;
- identification of existing labour force and unemployment statistics;
- existing housing market, particularly rental accommodation which may be available for the Project workforce;
- types and numbers of businesses;
- availability and prices of goods and services;
- historical descriptions of large scale industrial developments and their effects in the region; and
- the availability of suitable land for support industrial uses.

The economic impact statement should include estimates of the opportunity cost of the Project, and the value of ecosystem services provided by natural or modified ecosystems to be disturbed or removed during development.

3.11.2 Potential Impacts & Mitigation Measures

This section of the EIS should define and describe the objectives for protecting or enhancing economic values, and how the achievement of the objectives will be monitored, audited and managed.

The effect on local and State labour markets should be discussed with regard to the source of the workforce. This information should be presented according to skilled and semi-skilled worker categories.⁵⁰ In relation to the source of the workforce, clarification is required as to whether the Proponents or contractors are likely to employ locally or through other means and whether there are initiatives for local employment opportunities. Labour market 'alternative labour-pool sources' for skilled and semi-skilled workers (other than the Rockhampton region), should be included in the EIS investigations.⁵¹

The EIS should investigate the potential impacts on the Rockhampton region's labour pool and possible mitigation strategies including:

- potential utilisation of contractors and subcontractors as an alternative supply of skilled and semi-skilled workers;

⁵⁰ REG (1)

⁵¹ REG (2)

- implementation of capping limits on labour supplied from the Rockhampton region and the establishment of quantitative measuring methodologies;
- the inclusion, training, sourcing, and occupational identification of apprentices for the construction site, with potential for employment in the production phase and up-skilling of the current available workforce in advance of the construction phase; and
- development of support strategies to assist current Rockhampton region employers with backfilling skilled shortages caused by employees moving to the Project.⁵²

The impacts of both construction and operational workforces and associated contractors on housing demand should be addressed. The capability of the existing housing stock, particularly rental accommodation, to meet any additional demands created by the Project should be discussed.

Any new skills and training to be introduced in relation to the Project should be identified. Adequate provision should be made for apprenticeship and worker training schemes. The EIS should indicate the occupational skill groups required and potential skill shortages anticipated.

An economic analysis should be presented from national, state, regional and local perspectives as appropriate to the scale of the Project. The general economic benefits from the Project should be described. The analysis should include:

- the relative significance of this proposal in the local and regional economic context;
- the short and long-term beneficial (e.g. job creation) and adverse (e.g. competition with local small business) impacts that are likely to result from the development;
- the potential, if any, for direct equity investment in the Project by local businesses or communities;
- the need for any additional infrastructure provision by all levels of government;
- implications for future development in the locality (including constraints on surrounding land uses and existing industry);
- the distributional effects of the Project, including proposals to mitigate any negative impact on disadvantaged groups;
- the extent to which local and other Australian goods and services will be used; and
- impacts on local property values.

The EIS should address how the proposed Project will meet relevant outcomes contained in the *Central Queensland Regional Growth Management Framework* document and deal with actions and strategies identified for natural resource management through the *Fitzroy Basin Association's Strategy for Sustainability* prepared under the *National Action Plan for Salinity and Water Quality*.⁵³

3.12 TRANSPORT INFRASTRUCTURE

3.12.1 Description of Environmental Values

This section should describe existing infrastructure facilities within and adjacent to the Project area. The location and owner/custodians of all tenures, reserves, roads and road reserves, railways and rail reserves, stock routes easements and the like, covering the affected land should be shown. The locations and descriptions of all existing roads, railways, gas and water pipelines, power lines, telecommunications systems, constructed waterways, and any other infrastructure within the Project area, or likely to be affected by Project activities, should be provided. Any environmental values likely to be affected by this infrastructure should be described. Transport infrastructure also includes the transport operations that utilise that infrastructure.⁵⁴

⁵² REG (3)(4)(5)&(6)

⁵³ DLGPSR (1)&(2)

⁵⁴ DMR (32)

3.12.2 Potential Impacts & Mitigation Measures

This Section of the EIS should detail impacts of the Project on existing roads, railways, port facilities, powerlines, pipelines, telecommunication lines, and other built infrastructure in relation to the transportation requirements outlined in Section 2.6.1. This evaluation should include any potential requirements to reschedule existing infrastructure construction, rehabilitation and maintenance programs.⁵⁵

All impacts resulting from the transport of plant, equipment, raw materials excluding coal (see footnote)⁵⁶ product, wastes and personnel during the construction, operational and decommissioning phases of the Project should be described. The description should address the capacity⁵⁷ of existing facilities to support the requirements and any additional requirements for the construction, upgrading or relocation of any transport related infrastructure required by the Project directly and as a result of potential cumulative impacts. The analysis should also address any requirements for new or changed services in road reserves.⁵⁸

Special reference should be made to any relationship between Project road works and works proposed in the current Roads Implementation Program of the Department of Main Roads (DMR). Road infrastructure should be described and assessed according to DMR's *Guidelines for Assessment of Road Impacts of Development Projects (Nov 2000)*. The EIS should discuss the results of consultation with the relevant district and regional officers⁵⁹ of DMR and local government regarding the potential impacts of the Project on the road network.

This section should address how transport elements and impacts of the Project, taking into account future demand growth, relate to Queensland Transport's and the DMRs' existing transport strategies for the Central Queensland area and the future infrastructure needs of this area as presented in State Government documents, including: *Statements of Intent for Road Link Development*; *Gladstone Integrated Regional Transport Plan 2001 – 2030*; and *Capricornia Integrated Regional Transport Plan 2004 – 2030*. It is also necessary to make reference to the planning schemes of the relevant local governments. It should also specifically address the inter-modal interface between road and rail haulage for coal haulage, taking into account the potential cumulative impacts of individual projects and constraints in the rate of expansion of rail capacity.⁶⁰

The Regional Harbour Master Gladstone should be adequately consulted regarding maritime issues relating to the export of coke. The EIS should discuss the results of the consultation. The EIS should also outline arrangements made with the Central Queensland Ports Authority for the storage, handling and export of coke from the plant.

Detail on product spill management for transport infrastructure should be addressed in other relevant sections of the EIS.

3.12.3 Traffic

This section of the EIS should address the impact of traffic generated by the Project on both the local government and state-controlled road network in terms of adverse road impacts, including pavement and structures degradation, intersection performance, road link and road network performance, road safety, access requirements, noise impact, air quality and existing drainage

For the purposes of the EIS, the Project does not include any upstream coal mine development and associated transportation components. Impact assessment for any such development would be undertaken in a separate process

⁵⁵ DMR (33)

⁵⁶ QR (1)

⁵⁷ DMR (35)

⁵⁸ DMR (36)&(37)

⁵⁹ DMR (39)

⁶⁰ DMR (40)(41)(42)(43)&(44)

near roads.⁶¹ The traffic impacts on local residents and business operations should also be addressed.⁶² This includes the effect of any proposed new or upgraded rail operations and/or infrastructure on the 'risk score' of rail/road and rail/private level crossings along the entire haul route (i.e. from the core project site to the export site of the Project).⁶³

Strategies for managing all road impacts of the Project, including road safety, should be presented.⁶⁴

The impacts of any increased traffic (due to construction activities and/or on-going operations) on existing school bus routes and services should be discussed. Necessary measures to eliminate or minimise the impact on the operation of these services and any infrastructure proposed (such as bus pull-off areas) to maintain current safety standards should be presented.

A comparison of the traffic situation and road conditions with and without the Project should be shown. The EIS should include traffic management measures as part of a draft road use management plan that deals with mitigating the impacts of both the construction and operational phases of the Project on the road network. The draft road use management plan should cover issues related to traffic, operational performance, safety, and other aspects. The final version of the road use management plan will form part of the Environmental Management Plan (or plans) as proposed in Section 4.⁶⁵

3.13 HEALTH & SAFETY

This section of the EIS should define and describe the objectives for protecting or enhancing health and safety community values. It should detail any impacts of the Project during construction and operation⁶⁶ on the health and safety of the community, workforce, suppliers and other stakeholders, in terms of health, safety and quality of life from factors such as air emissions, odour, dust, pests, traffic,⁶⁷ noise and vibration,⁶⁸ waste and water. This includes health and safety matters associated with onsite and offsite workforce accommodation.⁶⁹ It should include details of:

- compliance with relevant Health and Safety legislation;
- security arrangements;
- emergency plans and safety management strategies, as well as corroboration of the effectiveness of such systems;
- details of on-site emergency response capabilities (e.g. on-site paramedic or first-aid officer), for both the construction and operational phases of the Project, which should include personnel trained for fire suppression and containment, rescue and first aid;
- the risk assessment conclusions reached and the level of off-site risk from the proposed developments; and
- the location and nature of sensitive sites including, but not limited to, residences and schools, within the surrounding 10 kilometre radius.⁷⁰

An onsite Occupational Health and Safety Risk Assessment should be completed by the Proponent.⁷¹

⁶¹ DMR (47)

⁶² QH (16)

⁶³ QR (5)

⁶⁴ DMR (48)

⁶⁵ DMR (50)

⁶⁶ QH (20)

⁶⁷ QH (17)

⁶⁸ QH (10)

⁶⁹ QH (3)

⁷⁰ DES (12)

⁷¹ DES (1)

Safety management strategies and control measures to be used to minimise the risks of incidents on site and to minimise the consequences of any incident under known operating conditions should be included in the EIS. This information should include:

- the handling of reworked or recycled material;
- the prevention and handling of fires on site;
- the segregation of incompatible products and ingredients;
- the containment of hazardous materials;
- the collection, treatment and disposal of any spillage of hazardous materials and wastes (provide details of the design, volume and capacity of any retention ponds, process tanks, waste holding tanks or bunded areas);
- the application of safety distances to the various activities on site to minimise consequences of incident;
- quality control of products and raw materials on site, including handling of non-conforming material;
- maintenance of critical items of equipment;
- the training of operatives; and
- emergency procedures, including evacuation procedures where necessary.

In regard to fires, the EIS should address the following:

- building fire safety measures for any construction or permanent accommodation;
- details of any changes to existing emergency response plans for the Stanwell Power Station and bushfire mitigation plans under the SPP 1/03;
- details of command and control hierarchy structure between the proponents SCL & QCE in relation to emergency plans;
- details of the system for transferring the steam from the coke plant to the power station i.e. route, safety control points, etc.;
- on-site fire fighting equipment provided and the level of training of staff (if any) who will be sourced with emergency management activities;
- detailed maps showing the plant outline, hazardous material store, incident control points, fire fighting equipment, etc.;
- details of any dangerous goods stores associated with the coke plant operations including fuel storage and emergency response plans; and
- details of the rail spur to be constructed and location points for emergency vehicle access.⁷²

An assessment should be made of any areas where mosquitos may breed (e.g. areas with poor drainage or where water ponds) and mitigation measures developed to prevent the harbourage and breeding of mosquitoes and other pests of public health significance. The EIS should include a discussion on the site planning, management, mitigation and monitoring of potential pest impacts by considering Division 2 of Part 8 of the *Health Regulation 1996*. This section should draw on the information in Queensland Health's *Guidelines to Minimise Mosquito and Biting Midge Problems in New Development Areas (March 2002)*.⁷³

3.13.1 Hazard Analysis

The EIS should identify all legislation, standards and codes of practice in relation to the storage and handling of hazardous materials.⁷⁴

A hazard identification exercise should be conducted in order to identify the nature and scale of all hazards which might occur during the Project, such as the potential for release of gaseous or

⁷² DES(4)(5)(6)(7)(8)(9)(10)&(11)

⁷³ QH (5)&(6)

⁷⁴ DES(13)

particulate pollutants or any other hazardous material used, produced or stored on the site. This should include the impact on the Project of any natural events such as cyclones, earthquakes, bushfires or local flooding. Any identified impact on the Project should also be extended to determine the resultant impact on the surrounding area and community. The hazard identification exercise must include a risk assessment consistent with *Australian / New Zealand Standard for Risk Management 4360:2004*.

The risk analysis is to address the potential impacts that may occur on the normal on-site day-to-day activities during the construction of the facilities. Furthermore, the Proponent must determine the level of change that may result on the Stanwell Power Station's risk contours as a result of the proposed Project. The risk contours are to be prepared in accordance with the protocol used in *Industrial/Residential Interface Buffer Arrangements, Wynnum* (Peter J Turnbull Pty Ltd & UniQuest Ltd, April 1999).

Any changes to operating or storage procedures that would reduce the possibility of these events occurring, or reduce the severity of the events should they occur, are to be identified and adopted where appropriate. A set of representative incident scenarios should be selected. This set should initially include worst case scenarios (e.g. a catastrophic failure of a storage vessel or processing unit).

A preliminary analysis of the consequences of these incidents on people, property and the biophysical environment should be conducted to identify potential impacts.

If this preliminary analysis predicts significant off-site impacts, a risk analysis should be performed. This will require an evaluation of the likelihood of each scenario occurring in order to calculate the level of risk in surrounding areas due to the presence of the facility. Risk contours should be presented on a suitably scaled location map.

The acceptability of the risk to surrounding land uses should be assessed by referring to nationally-adopted risk criteria presented in the New South Wales Department of Urban Affairs and Planning's *Hazardous Industry Planning Advisory Paper No. 4 "Risk Criteria for Land Use Safety Planning"*.

Details of the methodology and results of each step described above should be presented in the EIS.

The EIS should refer to *State Planning Policy 1/03 – "Mitigating the Adverse Impacts of Floods, Bushfire and Landslide"* in relation to mitigation measures.⁷⁵

3.13.2 Safety Systems and Emergency Planning

Details of the design and operation of proposed safety systems, including fire prevention and protection, leak detection and minimisation, and emergency shutdown systems and procedures, should be presented. The contingency procedures to respond to an emergency, equipment failure or other malfunction that results in the release of contaminants should be discussed.

Details of the emergency planning procedure to be adopted, and a copy of the emergency plans and procedures developed to date should be included. The development of emergency planning and response procedures is to be determined in consultation with regional emergency service providers.

⁷⁵ DES (15)

4. Environmental Management Plans

This section of the EIS should present environmental management plans (EMPs) developed for the Project. It is expected that all EMPs will be prepared in accordance with the EPA Guideline “*Preparing Environmental Management Plans*”. Separate EMPs should individually address the discrete Project elements such as the power station, the coke plant, rail loading/unloading sites and haul routes between the core project site and the export site, and port operations.⁷⁶ The EMPs should be developed from the preceding information in the EIS.

An EMP should provide life-of-proposal control strategies in accordance with agreed performance criteria for specified acceptable levels of environmental harm. In addition, EMPs should identify:

- potential impacts on environmental values;
- mitigation strategies;
- relevant monitoring;
- appropriate indicators and performance criteria;
- reporting requirements; and
- appropriate corrective actions, should an undesirable impact or unforeseen level of impact occur.

The aims of an EMP are to provide:

- commitments by the Proponents to practical and achievable strategies and design standards (performance specifications) for the management of the Project to ensure that environmental requirements are specified and complied with;
- an integrated plan for comprehensive monitoring and control of impacts;
- local, State and Commonwealth authorities, stakeholders and the Proponents with a common focus for approvals conditions and compliance with policies and conditions; and
- the community with evidence that the environmental management of the Project is acceptable.

The recommended structure of each element of the EMP is:

Element/issue:	Aspect of construction or operation to be managed (as it affects environmental values).
Operational Policy:	The operational policy or management objective that applies to the element.
Performance Criteria:	Measurable performance criteria (outcomes) for each element of the operation.
Implementation Strategy:	The strategies, tasks or action program (to nominated operational design standards) that will be implemented to achieve the performance criteria.
Monitoring:	The monitoring requirements to measure actual performance (i.e. specified limits to pre-selected indicators of change).
Auditing:	The auditing requirements to demonstrate implementation of agreed construction and operation environmental management strategies and compliance with agreed performance criteria.

⁷⁶ QR (6)

Reporting: Format, timing and responsibility for reporting and auditing of monitoring results.

Corrective Action: The action (options) to be implemented in case a performance requirement is not reached and the person(s) responsible for action (including staff authority and responsibility management structure).

An EMP should commit to manage, enhance or protect identified environmental values. The commitments should contain the following components for performance criteria and implementation strategies:

- environmental protection objectives for enhancing or protecting each relevant value;
- indicators to be measured to demonstrate the extent to which the environmental protection objective is achieved;
- environmental protection standards (a numerical target or value for the indicator), which defines the achievement of the objective; and
- an action program to ensure the environmental protection commitments are achieved and implemented. This will include strategies in relation to:
 - (a) continuous improvement;
 - (b) environmental auditing;
 - (c) monitoring;
 - (d) reporting;
 - (e) staff training; and
 - (f) a decommissioning program for land proposed to be disturbed under each relevant aspect of the proposal.

5. References

All references used in the preparation of the EIS should be presented in a recognised format such as the Harvard standard (refer to the Style Guide, Australian Government Publishing service). This standard lists references by presenting in the following order: author (date of publication) title, publisher, and place of publication.

6. Recommended Appendices

6.1 Final Terms of Reference

The finalised Terms of Reference should be included as an Appendix to the EIS.

6.2 Development Approvals

A list of the development approvals required by the Project should be provided.

6.3 Consultation Report

A list of advisory agencies should be provided in a summary Consultation Report, which should also list the Commonwealth, State and Local government agencies consulted, and the individuals and groups of stakeholders consulted. A summary of the issues raised by these groups, and the means by which the issues have been addressed, should be provided in the text of the EIS.

The EIS should summarise the results of the community consultation program, providing a summary of the groups and individuals consulted, the issues raised, and the means by which the issues were addressed. The discussion should include the methodology used in the community consultation program, including criteria for identifying stakeholders and the communication methods used.

Information about identifying affected parties (as defined by the *EPBC Act*) and interested and/or affected persons (as defined by the *EP Act*) should be included.

6.4 Study Team

The qualifications and experience of the study team and specialist sub-consultants should be provided.

6.5 Technical Data and Baseline Studies

Relevant supporting data and information generated from specialist studies undertaken as part of the EIS are to be included as appendices. These may include:

- geology;
- soil survey and land suitability studies;
- land use and land capability studies;
- waterway hydrology and groundwater;
- flora and fauna studies, including the subregional analysis of representativeness and adequacy of protection for the terrestrial/riparian vegetation communities and their component flora and fauna taxa within the affected areas;
- an integrated assessment of relative biodiversity/conservation values, based on the methodology outlined in "*Biodiversity Assessment and Mapping Methodology (EPA 2002)*";

- air pollution, noise and vibration;
- transport and traffic studies;
- economic studies and/or cost-benefit analyses; and
- hazard and risk studies.

6.6 List of Proponent Commitments

A list of all commitments made by the Proponents in the EIS should be provided, together with a reference to the relevant section in the EIS.