Queensland Government

State Development and Innovation

CENTRAL QUEENSLAND GAS PIPELINE PROJECT (Moranbah to Gladstone)

TERMS OF REFERENCE FOR AN ENVIRONMENTAL IMPACT STATEMENT

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

July 2005

Preamble

Project Proponent

Enertrade is a wholesale energy trader owned by the Queensland Government. The Corporation was originally established as part of the restructuring of Queensland's electricity industry. Enertrade has developed to be an active participant in Australia's competitive energy market (electricity and gas) specifically targeting large industrial customers with diverse energy needs. Enertrade has the rights to the generation output from several privately owned power stations and owns two gas pipelines, including the North Queensland Gas Pipeline from Moranbah to Townsville.

Project Summary

Enertrade is proposing to build, own and operate approximately 440km of high pressure gas transmission pipeline in Central Queensland from Moranbah to Gladstone. The pipeline will be a buried, 300 - 450mm nominal diameter, high pressure gas transmission pipeline to supply coal seam gas (CSG) from Moranbah in central Queensland to Gladstone. Expansion of the existing Enertrade compression facilities at Moranbah is anticipated as part of this Project.

The proposed pipeline route will traverse land under the jurisdiction and interest of Local, State and Commonwealth Government Agencies. This Terms of Reference (TOR) document has been drafted to meet the legislative requirements of all Government agencies.

Enertrade has prepared an Initial Advice Statement (IAS), which provides further detail relating to the Project, which can be viewed at www.sdi.qld.gov.au/eis.

Administrative Details for these Terms of Reference

The Central Queensland Gas Pipeline Project (Moranbah to Gladstone) was on 16 December 2004 declared a significant project by the Queensland Coordinator-General (CoG) pursuant to Section 26 of the Queensland *State Development and Public Works Organisation Act 1971* (the 'SDPWOA') and this declaration requires Enertrade to prepare an EIS under that Act. These TOR are to assist Enertrade to develop a comprehensive EIS for the Project.

The Commonwealth Department of the Environment and Heritage, has decided that the Project is a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*). The Project therefore requires approval under Part 9 of the *EPBC Act* before it can proceed. The controlling provisions are sections 18 and 18A of the *EPBC Act*: Listed threatened species and communities. The Commonwealth therefore will also be an assessment agency for the EIS.

Consequently, the abbreviation 'EIS' used in this TOR should be interpreted as satisfying the impact assessment requirements of all relevant State and Commonwealth statutes for this Project.

Under a Bilateral Agreement between the Commonwealth and the Queensland State Governments, the State EIS process conducted by the Coordinator-General will be used by the Commonwealth to make its assessment of the controlled actions for the purposes of the EPBC Act. The Department of State Development and Innovation (DSDI) will manage the impact assessment process for this Project.

A body of State and Local Government representatives and other appropriate authorities has been invited to participate as Advisory Agencies for the EIS process and has been requested to examine the IAS and to comment on the draft TOR. The IAS and draft TOR have also been provided for public comment. Comments of Advisory Agencies and the public have been considered for incorporation into the final TOR issued by the CoG to the proponent.

When Enertrade has prepared the EIS, it will be made available for public and Advisory Agency review and comment. DSDI will coordinate the consultation process between Enertrade, the Advisory Agencies and the public. DSDI will collate and review all comments received on the EIS.

Enertrade will be requested to provide responses to the comments received on the EIS and is likely to prepare a Supplementary EIS for this purpose. At the conclusion of this process, the CoG will prepare an Evaluation Report on the EIS. The CoG's Report will be provided to Enertrade, the Queensland Minister for Natural Resources and Mines, the Queensland Minister for the Environment, any Assessment Manager/s under the *Integrated Planning Act* and the Commonwealth Minister for Environment and Heritage (under the *EPBC Act*) .

The Coordinator-General's Report will indicate to the Development Approval Assessment Manager for the project, either the conditions for approval, whether it should be part or preliminary approval, or whether the application must be refused.

Where approval is required under another Act, such as the *Petroleum and Gas (Safety and Production) Act 2004 (P&G Act),* the CoG's Report may recommend (with reasons) to the person who will consider an approval required for the Project that:

- Approval for the project be refused, or
- Stated conditions to be imposed on the approval.

Alternatively, the CoG's Report may recommend that there are no conditions to be attached to any approval given under another Act.

To build and operate the gas pipeline, Enertrade will require a pipeline licence under the *P&G Act* from the Minister for Natural Resources and Mines. Whilst Enertrade is free to make an application for a pipeline licence at any time, the licence will not be issued until the EIS has been completed and the CoG's Evaluation Report has been released. The Project will also require an Environmental Authority from the delegate of the Queensland Minister for Environment under the *Environmental Protection Act 1994* (the '*EP Act*'). Activities authorised under the *P&G Act* are exempt from the *Integrated Planning Act 1997* (*IPA*).

This TOR provides information in two broad categories:

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

The Department's Project Manager for any further enquiries will be:

Mr Denis Wayper

Project Manager – Central Queensland Gas Pipeline Project
Project Delivery
Department of State Development and Innovation
PO Box 15168
BRISBANE CITY EAST QLD 4002
Tel: (07) 3224 8554 Fax: (07) 3225 8282
Email: Denis.Wayper@qld.gov.au

Table of Contents

Part A – Information and Advice on the preparation of the EIS

1. INTRODUCTION

This Terms of Reference (TOR) for an Environmental Impact Statement (EIS) for the Central Queensland Gas Pipeline Project (Moranbah to Gladstone) has been developed in accordance with the requirements of Sections 29 30 and 31 of the *State Development & Public Works Organisation Act 1971* (the 'SDPWOA').

The objective of the TOR is to identify those matters that should be addressed in the EIS. The TOR is based on the initial outline of the proposed Project given in the Initial Advice Statement (IAS).

The Commonwealth and State Government, from which the Project Proponent requires approvals, may request additional information on any matter not adequately dealt with in the EIS report. 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 Proponent must be clearly identified and placed in discrete attachments to the main report.

An executive summary should be provided in the EIS and be available separately for public information.

2. EIS OBJECTIVES

The objective of the EIS is to identify potential environmental, social and economic impacts and to ensure that 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 pipeline alignment, 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 site, 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; as appropriate, set conditions for approval to ensure environmentally sound development and, where required by legislation, recommend an environmental management and monitoring program.

- Commonwealth matters of National Environmental Significance to be specifically addressed under the requirements of the *EPBC Act* are:
    - sections 18 and 18A (Listed threatened species and communities) including, but not limited to, vine thicket communities, bluegrass and Brigalow communities.
- For the Proponent: 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 (EMP) that describes acceptable impacts and environmental management strategies to agreed performance criteria is the recommended means of achieving this objective.

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

3. GENERAL EIS GUIDELINES

The key principle is that there should be sufficient detail presented in the EIS to enable readers to judge the impact of the Project on the natural and built environment. The EIS should be a stand alone document. It should contain sufficient information from the route selection criteria and other appended studies to avoid the need to search out previous reports.

It should be acknowledged that readers are likely to include representatives of Commonwealth, State and Local Governments, special interest groups and the general public.

The EIS should relate to the entire life of the Project including construction, operation, maintenance, and decommissioning (including rehabilitation) of all Project related sites. 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 EIS should include analysis of any cumulative impacts on environmental values caused by the Project. The cumulative impacts of the proposal must be considered over time or in combination with other (all) impacts in the dimensions of scale, intensity, duration or frequency of the impacts. Cumulative impacts on the environmental values of land, air and water and cumulative impacts on public health and the health of terrestrial, aquatic and marine ecosystems must be discussed in the relevant sections. This assessment may include air and water sheds affected by the proposal and other proposals competing for use of the local air and water sheds.

The EIS should state the following about information, assessments and assumptions provided in the EIS:

- The source of the material, with appropriate references;
- How recent the material is;
- How the reliability of the material was tested; and
- Any uncertainties in the material.

The EIS should state the criteria adopted in assessing the proposed Project and its impacts, such as compliance with relevant legislation, policies, standards, community acceptance and maximisation of environmental benefits and minimisation of risks.

The level of analysis and detail in the EIS should reflect the level of significance of the expected impacts on the environment.

Any prudent and feasible alternatives should be discussed and treated in sufficient detail, and reasons for selection of the preferred option should be clearly identified.

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, pipeline corridors etc) should be presented.

The terms "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. Should Enertrade require any information in the EIS to remain confidential, this should be clearly indicated, and separate information should be prepared on these matters.

Within this TOR the term "Project" includes all activities undertaken on lands covered by the proposed pipeline corridor, compression facilities, any right-of-way (ROW) necessary for construction purposes and supporting project infrastructure.

Copies (number to be advised) of the prepared EIS should be lodged with the DSDI for distribution to Advisory Agencies for comment and review during the public review period. In addition, an electronic version of the EIS will be made accessible through either the DSDI or Enertrade Internet sites. A quantity of the EIS documents should also be prepared for distribution to relevant interstate and intrastate libraries and other key Government offices. There is a preference for documents to be made available in CD ROM format, however a quantity of hard copy documents should also be produced.

While every attempt has been made to ensure that these TOR address all of the major issues associated with this Project, they are not necessarily exhaustive and should not be interpreted as excluding from consideration matters deemed to be significant but not incorporated in them or matters (currently unforeseen) that emerge as important or significant during the completion of scientific studies, from public consultation, or otherwise, during the course of preparation of the EIS.

4. STAKEHOLDER CONSULTATION

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

It is the responsibility of the Proponent, 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.

Where appropriate, it is recommended that interim alignment discussion papers (or similar) be prepared for on-going consultation with relevant Advisory Agencies and other stakeholders regarding the route alignment.

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.
- 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.

TOR GLOSSARY

The following abbreviations have been used in this document:

AHD	Australian Height Datum
ANZECC	Australia and New Zealand Environment and Conservation Council
CHMP	Cultural Heritage Management Plan
CO	Carbon Monoxide
CoG	the Coordinator-General of the State of Queensland.
CSG	Coal Seam Gas
DLGP	Department of Local Government and Planning
DMR	Department of Main Roads
DNRM	Department of Natural Resources and Mines
DPI&F	Department of Primary Industries & Fisheries
DSDI	Department of State Development and Innovation
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EP Act	*Environmental Protection Act 1994*
EPA	Environmental Protection Agency
EPBC Act	*Environment Protection & Biodiversity Conservation Act (C'wlth) 1999*.
ERA	Environmentally Relevant Activity
ESD	Ecologically Sustainable Development
IAS	Initial Advice Statement as defined by part 4 of the *State Development & Public Works Organisation Act 1971*
NES	National Environmental Significance as defined by the *Environment Protection & Biodiversity Conservation Act (C'wlth) 1999*.
NOx	Oxide of Nitrogen
NTRB	Native Title Representative Bodies
P&G Act	*Petroleum and Gas (Safety and Production) Act 2004*
ROW	Right-of-Way
SDPWOA	*State Development & Public Works Organisation Act 1971*
TOR	Terms of Reference as defined by part 4 of the *State Development & Public Works Organisation Act 1971*

Part B – Specific Requirements – Contents of the EIS

The EIS Report shall address the following matters and may be structured with similar headings to the Terms of Reference:

TITLE OF PROPOSED DEVELOPMENT

NAMES AND ADDRESSES OF PROPONENTS

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 Proponent, and a discussion of previous projects undertaken by the Proponent 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 advisory agencies.
- 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.
- An outline of the principal environmental impacts predicted and the 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, acronyms and references should be provided.

1. INTRODUCTION

The introduction should clearly explain the function of the EIS, why it has been prepared and what it sets out to achieve. It should define the audience to whom it is directed, and contain an overview of the structure of the document.

1.1 Project Description

This section should provide a brief description, including a summary of any major associated infrastructure requirements of the key elements of the project. Detailed descriptions should follow in the appropriate sections.

A brief description should be provided of studies, Government Policies or surveys undertaken for the purposes of developing the project and preparing the EIS.

1.2 Project Objectives

This section should:

- State objectives leading to the development of the proposal.
- Outline events leading up to the proposed Project's formulation, including alternatives, envisaged time scale for implementation and project life, and action already taken within the Project area.

1.3 Project Proponent

This section should describe the experience of the Project Proponent, including nature and extent of business activities, experience and qualifications, and environmental record including the Proponent's environmental policy.

1.4 The Environmental Impact Assessment Process

1.4.1 Methodology of the EIS

This section should provide an outline of the impact assessment process steps, timing and decisions to be made for relevant stages of the project, including compliance with regulatory requirements, referral to final TOR, and types of information detailed within the EIS and any complementary or subsequent documentation (i.e. technical background papers).

1.4.2 Objectives of the EIS

This section should provide a statement of objectives of the environmental impact assessment process. The structure of the EIS can then be outlined as an explanation of how the EIS will meet its objectives.

The audience should be able to distinguish the EIS as the key environmental document providing advice to decision makers considering approvals for the Project. The information in this section is required to ensure:

- That relevant legislation is addressed;
- There is awareness of the process to be followed; and
- That stakeholders are aware of any opportunities for input and participation.

1.5 Public Consultation Process

This section should outline the public consultation process that has taken place during EIS preparation and the results of such consultation. It should outline any further opportunities for public input on the draft EIS report.

The public consultation program should provide opportunities to encourage and facilitate active community involvement and education through public meetings, interest group meetings, production of regular summary information and updates, and other consultation mechanisms.

The public consultation process should identify broad issues of concern to local community and interest groups at all stages from project planning, through commissioning, operations and final decommissioning.

1.6 Project Approvals

1.6.1 Relevant Legislation and Policy Requirements

This section should explain the legislation and policies controlling the approvals process. Reference should be made to the *Environmental Protection Act 1994, State Development and Public Works Organisation Act 1971* and other relevant Queensland laws. A description of the Environmentally Relevant Activities (ERAs) necessary for each aspect of the project should be given.

Any requirements of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, including the results of a Referral, should also be included.

1.6.2 Planning Processes and Standards

This section should outline the project's consistency with existing land uses or long-term policy framework for the pipeline route, and particularly in relation to Gladstone City and Gladstone State Development area (e.g. as reflected in local and regional plans) and with legislation, standards, codes or guidelines available to monitor and control operations on site. It should refer to all relevant State and regional planning policies. This information is required to demonstrate how the proposal conforms to State, regional and local policies for the area.

2. PROJECT SUBSTANTIATION

2.1 Need for the Project

The EIS should address the specific objectives and justification for the proposal. Issues to be addressed include:

- Strategic, economic and environmental implications of the proposal including future energy consumption and production and supply security.
- Increased demands on natural resources (reserves of natural gas).
- Longer term strategic implications of the proposal in terms of a gas network throughout Australia, upgrade of existing infrastructure, expansion into other markets and demands on infrastructure arising from new proposals.
- Identification of customers (industrial, non-industrial and domestic), potential customers for the natural gas and the implications for the consideration of an open access policy.

- The Project's compatibility with the National Greenhouse Strategy, Government Ecologically Sustainable Development policy, Queensland Energy Policy, National Strategy on Conservation of Australia's Biological Diversity and any other relevant policy.

2.2 Costs and Benefits of the Project to Consumers and the Wider Community

This section should summarise:

- The economic costs and benefits to consumers, other industry and the wider community.
- Regional social impacts including employment, skills development and any workforce accommodation issues.

2.3 Alternatives

This section should describe feasible alternatives within the proposed Project, including the option of taking no action i.e. of not building the pipeline. Alternatives should be discussed in sufficient detail to enable an understanding of reasons for preferring certain options and courses of action and rejecting others. Reasons for selecting preferred options should be delineated in terms of technical, commercial, social and natural environment aspects. In particular, discussion of reasonably practicable alternatives to the Project should include:

- Alternative routes considered, aided by maps and diagrams. The Route options highlighting the preferred route, should be shown on topographical maps at a suitable scale.
- The rationale for selection of the preferred corridor and reasons other options were rejected.

3. DESCRIPTION OF THE PROJECT

The EIS should provide detailed description of construction, operation and decommissioning stages (including rehabilitation) of the project and any supporting compression requirements. Details should include:

- Design parameters for aspects of the Project that may impact upon the endangered and threatened species.
- A program covering activities relating to design, construction, commissioning and first operating activities.

3.1 Gas Pipeline

A detailed description of the pipeline project should be provided including:

- Map of the preferred route location using cadastral and topographical maps.
- Design parameters covering, pipe grade, diameter(s), wall thickness, length, capacity, test and operating pressures, depth of cover over the pipe, coating and design life.
- Above ground facilities - physical dimensions and construction materials for surface facilities along the pipeline route including information on pipeline markers.
- Details of criteria to assess the minimum depth the pipeline is to be buried under creeks, rivers and ephemeral waterways, in particular the crossings proposed for the Fitzroy, McKenzie and Calliope Rivers, taking into account Q100 flood events. Describe whether the proposed pipeline route intersects any areas below the Highest Astronomical Tide line.
- For the preferred pipeline route describe, with the aid of maps and diagrams, the location and/or frequency of cathodic protection points, sales taps, compressor stations, control valves (isolation points), and any other Project facilities and linkages to existing gas pipelines.
- Criteria for design and location of any temporary or permanent access crossing for machinery, transport etc. across any waterway (e.g. construction of causeways, bridges, culvert crossings etc.) and any permanent access points or roads for maintenance purposes, in particular where they are adjacent to waterways. Describe the nature of any permanent access points.
- Easement widths and access requirements along the route, including the use of existing areas of disturbance for pipeline access and future maintenance.
- Pipeline construction techniques including:
    - Plant and machinery likely to be involved.
    - Supply and storage of materials – volume, composition, handling and storage during construction.
    - Anticipated timing, duration and progress of pipe laying.
    - Possible interruption of pipeline laying to other land activities, e.g. interruption to road and or rail traffic.
    - Extent that service corridors will be used during construction and maintenance.
    - Width of vegetation clearing required. This information should indicate where vegetation to be cleared has significant conservation value (such as sensitive environmental areas and creek crossings), and should also cross reference where in the EIS the impacts on such vegetation have been addressed.
    - Management of soil during construction.

  - Depth of trenching and burial of the pipeline; bedding materials (if any) including compaction techniques on the pipeline trench and in particular adjacent to and within waterways, to achieve bank stability.
  - Procedures for trench construction and pipelaying if rock is encountered.
  - Typical crossing techniques including restoration works that would be used at creek crossings, and road, rail and other service corridor crossings. Detail whether the flow of water will need to be altered within and/or diverted out of any waterway during pipeline construction. Where in-stream infrastructure is in place, identify practicality of attaching the pipeline to these structures.
  - Management of weed seed spread including quarantine areas and washdown facilities and the dispersal/destruction of weed seeds and contaminated vegetative matter.
  - Management of air emissions, particularly dust, during construction.
  - Disposal of plant-matter left after clearing vegetation.
  - Details of the anticipated hydrostatic testing procedures (discussion of water usage for this activity should be addressed in Section 3.6).
  - Testing the pipeline's integrity, including cathodic protection requirements, launcher and receiver scraper stations and hydrostatic testing are to be outlined.
  - Cleanup and restoration (rehabilitation) of areas used during construction including camp sites and storage areas.
- Pipeline operation and maintenance – inspection and surveillance activities and frequency; including impact on waterways as a result of operation and maintenance activities, safety procedures (including provision for shut-down and/or venting in event of an emergency); provision for public safety in such circumstances.
- Decommissioning methodologies, clean up and rehabilitation.

3.2 Compression Facilities

This section should provide a description and layout of the compression facilities, including:

- Map showing location of any such facilities.
- On-site plans, layouts, boundaries and elevations.
- Detailed concept and staging (if any proposed) for additional compression facilities and locations.
- Any land acquisition required.
- Operational and management arrangements, including the administration and control of the facility.
- Options considered in determining the design of the facilities and reasons for the preferred option.
- Description of site preparation and construction activities, including:
  - Timing, staging and hours of construction work.
  - Proposed construction methods, equipment to be used, and method of transport of equipment and materials to the site.
  - Earthworks required.
- Chemicals and hazardous goods to be utilised.
- Public safety and emergency procedures.

3.3 Workforce and Accommodation

This section should provide details on the employment requirements and skills base of the required workforce for both the construction and operations phases of the project for the pipeline and compression facilities. The report should describe the deployment strategies proposed for the workforce over the construction period and the length of the pipeline.

Information should be provided on the accommodation requirements for the workforce, and if applicable, their family members.

If camp sites are to be used to accommodate the workforce, provide details on the number, location (shown on a map), proximity to the construction site and typical facilities for these sites. Information should include data relating to facilities for:

- Food preparation and storage;
- Ablution facilities;
- Vector and Vermin control;
- Fire safety;
- Indoor air quality; and
- Dust and noise control in relation to proximity of camp site to the construction area.

Outline local government approvals required for establishment and operation of such camps.

3.4 Gas Supply

This section should provide an analysis of the gas at extraction and the gas to be transported. Security of supply and resource availability should also be discussed.

3.5 Electricity and Telecommunications

This section should identify the extent of electricity supply requirements and energy conservation measures proposed.

Telecommunications requirements should also be noted.

3.6 Water Supply/Storage

The EIS should provide information on water usage by the Project, including the quality and quantity of all water to be used. In particular, the proposed and optional sources of water supply should be described (e.g. bores, mine water, any surface storages such as dams, weirs, watercourses and municipal water supply pipelines, etc).

Options for the source of water for hydrostatic testing, and any other construction/operational water use, should be discussed. Detail plans for any storage, re-use and disposal of water used for hydrostatic testing should be outlined.

Determination of potable water demand should be made for the Project, including the temporary demands during the construction period. Details should be provided of any existing town water supply to be used to meet such requirements. If water storage and/or treatment is proposed on site, for use by the site workforce, then this should be described. This description should include the management practices to maintain the quality of the water, including the source of the water, transportation, water treatment processes,, microbiological and chemical testing program.

3.7 Transport

This section should provide a brief over view of transport requirements. Full details of transport volumes and routes should be provided under Section 4.10 Traffic, Transport and Access Arrangements.

3.8 Waste

This section should provide a brief overview of the waste management requirements of the project. Full details of the waste volumes, characteristics and management strategies should be provided in Section 4.9 Waste.

4. ENVIRONMENTAL VALUES AND MANAGEMENT OF IMPACTS

This section should address all elements of the environment, (such as land, water, nature conservation, cultural heritage, social and economic, air, noise, waste, transport and traffic and hazards and risk) in a way that is comprehensive and clear.

The EIS should assess the impacts of the construction, operation and decommissioning stages (including rehabilitation) of the Project and any supporting compression requirements, together with impacts associated with potential ongoing maintenance, access and servicing resulting from the development and any other facilities required for the Project.

The functions of this section are to:

- Describe existing environmental values of the area that may be affected by the proposal;
- Describe potential adverse and beneficial impacts of the proposal on the identified environmental values;
- Present environmental protection objectives and the standards and measurable indicators to be achieved; and
- Examine viable strategies for managing impacts.

Environmental protection objectives may be derived from legislative and planning requirements which apply to the proposal including Commonwealth strategies, State planning policies, local authority strategic plans, environmental protection policies under the *Environmental Protection Act 1994*, and any catchment management plans prepared by local water boards or land care groups in support of the Central Qld Strategy for Sustainability 2004 and Beyond. Special attention should be given to those mitigation strategies designed to protect the values of any sensitive areas and any identified ecosystems of high conservation value within the area of possible proposal impact.

It is recommended that the EIS follow the heading structure shown below. The mitigation measures, monitoring programs, etc., identified in this section of the EIS should be used to develop the Environmental Management Plans for the project (see Section 5).

4.1 Land

This section should detail the existing land environment for all areas associated with the Project, including areas affected by the pipeline route, and any new permanent or temporary facilities constructed for the pipeline.

This section should also describe the potential for the construction and operation of the Project to change existing and potential land uses of the Project sites and adjacent areas.

4.1.1 Land Use and Infrastructure

4.1.1.1 Description of Environmental Values

The EIS should identify, with the aid of maps:

- Land tenure (including reserves, tenure of special interest such as protected areas and forest reserves, roads and road reserves, railways and rail reserves, and stock routes).
- Land use (urban, residential, industrial, agricultural, forestry, recreational, mining including mining and petroleum exploration tenures, mining leases, mining claims, mineral development licences and extractive industry permits).
- Areas covered by applications for Native Title determination or Native Title determinations (including traditional and contemporary uses of land and water by Aboriginal people and Torres Strait Islanders). Provide description of Native Title Representative Bodies (NTRB) boundaries.
- Information on any known occurrences of economic mineralisation and extractive resources within the project area.
- Distance of facilities and pipelines from residential and recreational facilities.
- The locations of gas and water pipelines, power lines, roads and any other easements.
- The location of fences and gates to be crossed by the pipeline or constructed for pipeline access.

4.1.1.2 Potential Impacts and Mitigation Measures

- Identify any land units requiring specific management measures.
- Assess the compatibility of the proposal with surrounding land uses (e.g. mining).
- Describe possible impacts on surrounding land uses and human activities, including impacts to Good Quality Agricultural land and forestry land (addressing loss of access to land, fragmentation of sites, increase of fire risk and loss of productive land for those purposes) as well as residential and industrial uses.
- Indicate measures to be taken to minimise impact on Good Quality Agricultural Land.
- Describe strategy and progress in relation to making of Native Title agreements, including NTRBs, consultant selection, traditional owner involvement and related statutory processes.
- Comment on the suitability of the pipeline route for co-location of other infrastructure services, and/or the separation requirements with specific reference to transport corridors in the Gladstone State Development Area and the proposed Gladstone Rockhampton multi-user corridor.
- Outline the potential issues involved in proximity of the gas pipeline to electric power transmission lines and electrified rail lines, both at crossing points, where lines run parallel, and where construction and maintenance machinery is used in the vicinity of other infrastructure corridors.
- Include the specification of all possible impacts on, or sterilization of, identified mineral or energy resources and extractive industry deposits, the amount of sterilization (if any) of the deposits resulting from the construction and/or operation of the pipeline and associated infrastructure.
- Identify if Millable Timber or Quarry resources exist on the pipeline route and conduct an assessment of the commercial value of these resources satisfying the requirements of the DPI&F.

- The location of any proposed construction workers' accommodation along the route of the pipeline should be identified in maps.

4.1.2 Topography/geomorphology

4.1.2.1 Description of Environmental Values

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 should be included on the maps. Commentary on the maps should be provided highlighting the significant topographical features.

In coastal areas, where acid sulphate soils may be disturbed, and for major watercourse crossings, surrounding topography should be detailed at 1m increments with levels shown with respect to AHD.

4.1.2.2 Potential Impacts and Mitigation Measures

- Discuss the Project in the context of major topographic features and any measures taken to avoid or minimise impact to such (if required).
- The objectives to be used for the Project in re-contouring and landscaping should be described. Consideration should be given to the use of threatened plant species during any landscaping and revegetation.

4.1.3 Soils

4.1.3.1 Description of Environmental Values

Soils along the Project route should be described and mapped at a suitable scale, with particular reference to the physical and chemical properties of the soils which will influence erosion potential, storm water run-off quality, rehabilitation and agricultural productivity of the land, for example for dryland cropping, irrigated cropping or grazing uses. Information should also be provided on soil stability and suitability for construction of all Project facilities.

Soil should be mapped at a suitable scale and described according to the Australian Soil and Land Survey Field Handbook (Gunn et al 1988 and McDonald et al, 1990) using the Australian Soil Classification (Isbell, 1996). An appraisal of the depth and quality of useable soil should be undertaken. The location of each borehole should be accurately presented on maps, and boreholes should equitably represent different soil types present. Information should be presented according to the standards required in the Planning Guidelines: The Identification of Good Quality Agricultural Land (DPI, DHLGP, 1993), that supports State Planning Policy 1/92: Development and the Conservation of Agricultural Land.

Discuss the potential:

- For the existence of acid sulphate soils within the disturbance zone of the pipeline.
- For the existence of Good Quality Agriculture Land along and adjacent to the proposed pipeline route including alternative routes as outline in Section 2.3.
- For land contamination from existing and past uses based on land use history and the nature and quantity of any contaminants. A preliminary site investigation should be prepared including a search of Contaminated Land Register and Environmental Management Register.

4.1.3.2 Potential Impacts and Mitigation Measures

This section should provide details on any potential impacts on soils, including:

- Measures to ensure that soil erosion does not accelerate along the pipeline route due to construction or maintenance activities.
- Influence of time of year of construction on the impact on soils.
- Management measures for acid sulphate soils that may be encountered in association with the Project should be consistent with the guidelines that support State Planning Policy 2/02 – Planning and Managing Development Involving Acid Sulfate Soils Version 2 (DLGP and DNRM, August 2002) and Soil Management Guidelines Version 3.8, DNRM November 2002 (Dear et al, 2002).
- Management of any contaminated land and potential for contamination from construction/operation.
- Details of erosion control measures and criteria used to assess methods that will minimise/alleviate sedimentation over various terrain types including waterway beds, banks and adjacent areas. Methods of stockpiling and disposal of trench material from excavated streambed, bank, and adjacent areas should be included.
- Pipeline route adjustments and/or rehabilitation measures to minimise impacts on Good Quality Agricultural Land.

A description of topsoil management should consider transport, storage and replacement of topsoil to disturbed areas. The minimisation of topsoil storage times (to reduce fertility degradation) should also be addressed. Erosion and sediment control should be described with a Soils Erosion and Sediment Control Plan included in the EMP.

4.2 Climate

This section should describe climatic conditions in the Project area in relation to their bearing on the design of Project facilities, construction methods and operational parameters.

Discuss seasonal conditions (e.g. cyclones, thunderstorms, floods and storms) that may influence timing and/or construction methods and how this will be managed.

Discuss how weather will be monitored to minimise the risk of adverse impacts to the Project area during the construction period.

4.3 Water Resources

4.3.1 Description of Environmental Values

This section describes the existing environment for water resources that may be affected by the proposal in the context of environmental values as defined in such documents as the *Environmental Protection Act 1994, Environmental Protection (Water) Policy 1997* and ANZECC 2000. If a licence or permit will be required under the *Water Act 2000* to take or interfere with the flow of water, this section of the EIS should provide sufficient information for a decision to be made on the application.

- Existing surface and ground water in terms of physical, chemical and biological characteristics.

- Environmental values of the surface waterways of the affected area in terms of:
    - Values identified in the *Environmental Protection (Water) Policy*.
    - Sustainability, including both quality and quantity.
    - Physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form.
    - Any Water Resource Plans, Land and Water Management Plans relevant to the affected catchment.
- Existing surface drainage patterns, flows, history of flooding including extent, levels and frequency and present water uses.
- The watercourses to be crossed by the pipeline showing planned crossing locations on a map. Discuss consideration of alternative crossing locations in environmentally sensitive areas.

4.3.2 Potential Impacts and Mitigation Measures

This section is to assess potential impacts on water resource environmental values identified in the previous section. It will also define and describe the objectives and practical measures for protecting or enhancing water 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. Matters to be addressed should include:

- Likely impacts associated with the construction and operation of crossings of water courses, particularly with respect to erosion and scouring, and selection criteria for determining the final crossing type for various stream orders to protect watercourse integrity.
- Potential impacts on flooding levels upstream of any new crossing of water courses
- Amelioration or mitigation measures to address each impact identified that may affect local and regional water quality, particularly measures to ensure beds and banks of water courses remain stable and measures to safeguard downstream water quality.
- Possible sources of water pollution or other changes in water quality including soil erosion, siltation, accidental spills, waste and sewage disposal and likely chemical composition of any leachate from introduced fill on the site.
- The quality of water leaving construction sites (including physical, chemical and biological characteristics), potential impacts for any likely discharged water (e.g. hydrotest water) and how the impacts will be assessed.
- The effects of drainage works, placement of fill, clearing or any other alterations to existing topography and landform on the hydrology of the site including any alteration to drainage patterns and the water table and secondary influence on flooding. If levee banks or stream diversionary constructions are proposed, the effects on neighbouring landholders should be considered, and any works requiring permits or licensing in accordance with the *Water Act 2000* identified.
- Discussion of the proposed drainage structures for all aspects of the proposal, including supporting facilities such as access roads.
- Discussion of the timing of the construction works relative to likely periods of flooding and proposals to minimise the risk of adversely impacting downstream water quality.
- Discussion of measures to ensure viable weed seeds are not released into the water environment including from machinery traversing creek systems or riparian areas.

4.4 Nature Conservation

This section should detail the existing nature conservation values of the Project area.

The flora and fauna communities should be described, in particular those that are rare or threatened, in environmentally sensitive localities, including waterways, riparian zones, and wilderness and habitat corridors. The description should include species lists.

Reference should be made to both State and Commonwealth legislation and policies on threatened species and ecological communities.

All surveys undertaken should be in accordance with best practice advice from the EPA and should include consideration of seasonality, potential for occurrence of significant species, rarity of species and the sensitivity of the species to disturbance.

This section should also discuss all likely direct and indirect environmental harm on flora and fauna in both terrestrial and aquatic environments in sensitive areas.

The EIS should demonstrate how the project (including the proposed pipeline route and other areas of disturbance such as access tracks) would comply with the following hierarchy:

1. Avoiding impact on areas of remnant vegetation and other areas of conservation value.
2. Mitigation of impacts through rehabilitation and restoration.
3. Measures to be taken to replace or offset the loss of conservation values where avoidance and mitigation of impacts cannot be achieved.
4. Explanation of why measures 1 to 3 above would not apply in areas where loss will occur.

Discuss the exact alignment where the proposed pipeline runs through or adjacent to (within 1 km of) an endangered ecological community, including firm details of footprint width. Discuss why the alignment is preferred and the viability of alternatives where the alignment will impact upon a threatened community.

4.4.1 Sensitive Environmental Areas

4.4.1.1 Description of Environmental Values

The EIS should identify areas that are environmentally sensitive in proximity to the Project. Environmentally sensitive areas should also include areas classified as having State, Regional or Local Biodiversity Significance or flagged as important for their integrated biodiversity values.

In addition the *EPBC Act* should be addressed with regard to matters of national environmental significance identified by the Commonwealth when the project was deemed to be a 'controlled action,' e.g. listed threatened species and communities – particularly but not exclusively brigalow, bluegrass and semi-evergreen vine-thicket communities.

The proximity of the Project elements to any of these areas should be identified and mapped.

Areas which would be regarded as sensitive with regard to flora and fauna have one or more of the following features:

- Important habitats of species listed under the *Nature Conservation Act 1992* and/or *EPBC Act* as presumed extinct, endangered, vulnerable or rare.

- Regional ecosystems recognised by the Environmental Protection Agency (EPA) as 'endangered' or 'of concern' or 'not of concern' but where permits are no longer granted due to being at threshold levels, and/or ecosystems listed as presumed extinct, endangered or vulnerable under the *EPBC Act*.
- Ecosystems which provide important ecological functions such as riparian vegetation, important buffer to a protected area, refugia or important habitat corridor between areas.
- Protected areas which have been proclaimed under the *Nature Conservation Act 1992* or are under consideration for proclamation.

4.4.1.2 Potential Impacts and Mitigation Measures

- Discuss the impact of the proposal on species, communities and habitats of local, regional or national significance as identified above including brigalow, vine thicket and bluegrass. Discuss ways in which impacts can be minimised (e.g. timing of works, minimise width of disturbance, proposed rehabilitation of instream and floodplain disturbances).
- Discuss the planned rehabilitation of bluegrass, brigalow and semi-evergreen vine thicket communities and any relevant previous experience/experiments rehabilitating these communities.

4.4.2 Terrestrial Flora

4.4.2.1 Description of Environmental Values

Terrestrial vegetation maps at a suitable scale (e.g. 1:100,000 generally or 1:50,000 for appropriate detail locations) should be provided for the entire Project area. Mapping should be produced from aerial photos and ground truthing and should show and discuss:

- 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. (Eds) 1999.) and the EPA's web site (www.epa.qld.gov.au/environment/science/wildlife/) listing the biodiversity status of regional ecosystems.
- Location of species listed as Protected Plants under the *Nature Conservation (Wildlife) Regulation 1994* and subsequent amendments.
- Any plant communities of cultural, commercial or recreational significance should be identified.
- Vegetation map unit descriptions should also discuss their relationship to regional ecosystems. Sensitive or important vegetation types should be highlighted and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types discussed.

The description should contain a review of published information regarding the assessment of the significance of the vegetation to conservation, recreation, scientific, educational and historical interests. The assessment should also include the significance of native vegetation (including regrowth and restored areas in addition to remnant vegetation), from a local, regional, state and National perspective.

For each significant natural vegetation community likely to be impacted by the Project, undertake vegetation surveys at a sufficient number of sites, allowing for seasonal factors, as follows:

- All data requirements of the Queensland Herbarium CORVEG database should be collected.
- The minimum site size should be 500 square meters.
- 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.
- Vegetation mapping and data should be submitted to the Qld Herbarium to assist the updating of the CORVEG database.
- 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.

The existence of rare or threatened species should be specifically addressed under sensitive areas, and the location of any horticultural crops in the vicinity of the Project facilities should be shown.

Details of any riparian vegetation and native grasslands, and their value for fauna habitat and conservation of specific rare floral and faunal assemblages or community types, from both a local and regional perspective, should be provided. Any special landscape values of any natural vegetation communities should be described.

Existing information on plant species may be used instead of new survey work provided that the data are derived from surveys consistent with the above methodology. Methodology used for flora surveys should be specified in the appendices to the report. Any existing information should be revised and comments provided on whether the areas are degraded, cleared or affected in ways that would affect their environmental value.

The occurrence of pest plants (weeds), particularly declared plants under the *Land Protection (Land and Stock Route Management) Act 2002* should be shown on a map at an appropriate scale. A weed management strategy will be required to include the provision of surveys for pest plants to occur after significant rainfall events that will allow germination.

4.4.2.2 Potential Impacts and Mitigation Measures

- Discuss the ability of identified stands of vegetation to withstand any increased pressure resulting from the proposal and identify measures proposed to mitigate impacts.
- Describe the methods to ensure rapid rehabilitation of disturbed areas following construction including the species chosen for revegetation which should be consistent with the surrounding associations. Include details of any post construction monitoring programs and what benchmarks will be used for review of monitoring.
- Describe methods of minimising the potential for the introduction and/or spread of weeds or plant disease, including:
    - Identification of the origin of construction materials, machinery and equipment.
    - The need for vehicle and machinery washdown and any other hygiene protocols.
    - Staff/operator education programs.
- Include a weed management plan in the EMP, to be developed in consultation with local government environmental officers, to cover construction, rehabilitation and operation periods.

4.4.3 Terrestrial Fauna

4.4.3.1 Description of Environmental Values

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. Wildlife corridors and refugia along the proposed route should be identified and mapped.

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 which 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 rare, threatened or otherwise noteworthy species/communities in the study area, including discussion of range, habitat, breeding, recruitment, feeding and movement requirements, and current level of protection (e.g. any requirements of Protected Area Management Plans).

The EIS should contain results from surveys for species listed as threatened or migratory under the *EPBC Act*. Surveys are to be conducted at the appropriate time of year when the species is known to be present on the site, so that identification and location of these species is optimal.

The EIS should indicate how well any affected communities are represented and protected elsewhere in the subregion where Project sites occur. The methodology for subregional analysis of representativeness and adequacy of protection for the terrestrial/riparian vegetation communities and the flora and fauna taxa that inhabit them within the affected areas should be clarified.

Site data should be recorded in a format compatible with EPA WildNet databases.

4.4.3.2 Potential Impacts and Mitigation Measures

- Identify any impact the proposal may have on terrestrial fauna, relevant wildlife habitat and other fauna conservation values.
- Discuss measures to minimise wildlife capture and mortality in the open trench.
- Provide details of the methodology that will be used to assess and handle injuries that may be inflicted on livestock or native fauna as a result of operational works for the project.
- Discuss the method of minimising the introduction of feral animals, and other exotic fauna.
- Discuss the effects of construction activities and disposal of construction wastes on biting insect species of pest and health significance, including measures to prevent increases in these species.

4.4.4 Aquatic Biology

4.4.4.1 Description of Environmental Values

The aquatic flora and fauna occurring in the areas affected by the Project should be described noting the patterns and distribution in the waterways.

A description of the habitat requirements and the sensitivity of aquatic flora species to changes in flow regime, water levels and water quality in the Project areas should be described.

The discussion of the fauna and flora present or likely to be present at any time during the year in the area should include:

- Fish species, mammals, reptiles, amphibians, and aquatic invertebrates occurring in the waterways within the project area.
- Aquatic (waterway) plants.
- Aquatic substrate and stream type.

4.4.4.2 Potential Impacts and Mitigation Measures

- Discuss the potential for and mitigation measures to prevent the creation of new mosquito and biting midge breeding sites during construction (e.g. in quarries and borrow pits).
- Discuss any proposed stream diversions, causeway construction and crossing facilities, stockpiled material and other impediments that will restrict free movement of fish. Also include if seasonal construction of waterway crossings can avoid fish spawning periods.
- Identify necessary permits/authorities required by the Project (e.g. permits are required under the *Fisheries Act1994* to construct waterway barriers, temporary or permanent).

4.5 Historic and Cultural Heritage

4.5.1 Description of Environmental Values

The EIS should describe the existing environment values for cultural heritage that may be affected by the Project activities.

A cultural heritage study will be required which will describe indigenous and non-indigenous cultural heritage sites and places, and their values, and include:

- Consultation with:
    - The Register of the National Estate.
    - The Queensland Environmental Protection Agency regarding the Queensland Heritage Register and other information regarding places of potential non-indigenous cultural heritage significance.
    - The Department of Natural Resources and Mines regarding the Indigenous Site Database.
    - Any local Government heritage register.
    - Any existing literature relating to the affected areas.
- Liaison with representatives of relevant indigenous community/communities concerning:
    - Places of significance (including archaeological sites, natural sites, story sites etc), and appropriate involvement in field surveys.
    - Any requirements by communities and/or informants relating to selection of consultants and confidentiality of site data. Non-indigenous communities may also have relevant information.
    - Significance assessment of any cultural heritage sites/places located.

- Liaison with relevant community groups/organisations (eg local historical societies) concerning:
    - Places of Non-Indigenous cultural heritage significance
    - Opinion regarding significance of any cultural heritage places located or identified
- Identifying locations of culturally significant sites likely to be impacted by pipeline construction, including:
    - Stone artefact scatters.
    - Culturally significant vegetation.
    - Buildings or places of archaeological significance.
    - Archaeological sites, natural sites, story sites etc.
- When examining tenure, the location of historical mining areas should be shown on maps. This may be used to identify former mining zones or historical workings where slumping or other problems might occur in the future.
- A report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and conclusions and management recommendations (having due regard for any confidentiality requirements specified by community representatives).

As a minimum, investigations and consultation should be undertaken in such manner and detail to satisfy statutory responsibilities and duties of care, including those under the *Queensland Heritage Act 1992*, the *Aboriginal Cultural Heritage Act 2003* and the *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, to protect areas and objects of cultural heritage significance.

4.5.2 Potential Impacts and Mitigation Measures

Every attempt should be made to identify a pipeline route that avoids any significant heritage areas. The Proponent should provide an assessment of any likely effects on sites of European or Indigenous cultural heritage values, including but not limited to the following:

- Describing the significance of artefacts, items or places of conservation or cultural heritage value likely to be affected by the proposal and their values at a local, regional and national level.
- Recommended means of mitigating any negative impacts on cultural heritage values and enhancing any positive impacts.

The management of cultural heritage impacts should be detailed in a Cultural Heritage Management Plan (CHMP) that is developed specifically for the proposed Project. The CHMP should provide a process for the management of identified cultural heritage places and values within the proposed pipeline route. The CHMP should be based on information contained in the cultural heritage study report and/or information from Indigenous community/communities. The CHMP should include the following:

- A process for including Indigenous communities associated with the proposed pipeline route in protection and management of Indigenous cultural heritage.
- Processes for mitigation, management and protection of identified cultural heritage places and material along the proposed pipeline route, 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.
- A conflict resolution process.

The development of the CHMP should be negotiated with all relevant stakeholder representatives, subject to any confidentiality specified by indigenous communities and registered Native Title applicants.

As a minimum, impact assessment, protection and management strategies should satisfy statutory responsibilities and duties of care, including those under the *Queensland Heritage Act 1992*, the *Aboriginal Cultural Heritage Act 2004* and the *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984*.

4.6 Social and Economic Environment

4.6.1 Description of Environmental Values

This section should detail the existing social environment. Issues to be addressed include:

- Structure of potentially affected communities in the study area.
- Community profile, providing information on the following characteristics:
    - Rural properties, farms, croplands and grazing areas.
    - Demography and family structure.
    - Health status and sensitive groups.
    - Workforce characteristics, including types of skills or occupations and availability during both construction and operational stages.
    - Accommodation type, quantity and availability (as it relates to the need for accommodation of the Project construction and operation workforce).
    - Public health and education facilities.
    - Local government and public services.
    - Other community services and facilities.
- Socio-demographic characteristics, including employment and unemployment rates.
- Aboriginal people's traditional and contemporary uses of the land affected by the project.
- Economic base and economic activity.

4.6.2 Potential Impacts and Mitigation Measures

The social and community impacts of the proposed development should be addressed as part of the EIS incorporating any assessment of stakeholder concerns about adverse impacts to the natural, social, economic or built environment so that appropriate mitigation strategies can be developed. Considerations should be given to the following:

- The impact of the Project on existing agricultural and grazing land uses – e.g. disruption to stock, fences, water points, sowing or harvesting of crops, movement of agricultural machinery and any loss of agricultural land.
- The impact on affected landowners and communities– e.g. impact on property values and local authority rates.
- Restrictions to public access and recreational use during construction and operational phases, and after decommissioning.
- Strategies to minimise access requirements for operation and maintenance activities.
- The potential and mechanisms for local communities and businesses to meet contracts for services and supplies for the construction, rehabilitation and operation phases of the Project.

- Strategies for local residents including members of indigenous communities interested in employment opportunities, which would identify skills required for the Project and initiate appropriate recruitment and training programs.
- Describe the impact of the project on public health and safety of adjacent communities, including such impacts as noise, dust, waste, transport, and other hazards particulary for closely settled communities, such as in Gladstone city.
- Discuss the impact of accommodation requirements during construction and operation stages, on communities along the pipeline route
- The potential of the project to impact adversely on the existing supply of rental housing at locations along the route should be assessed.
- Any impacts (positive or negative) on the local and regional housing construction sector should be identified, with regard to the supply of dwellings for the construction workforce.
- Impact of the Project workforce on local human services (e.g. housing, education and health facilities), and local community social and recreational environments.
- Strategies responding to Government Policy relating to:
    - The level of training provided for construction contracts on Queensland Government building and construction contracts. (The State Government Building and Construction Contracts Structured Training Policy (the 10% Policy)).
    - Indigenous employment opportunities. (Indigenous Employment Policy for Queensland government building and Civil Construction projects (the 20% Policy)).
    - The use of locally sourced goods and services (making use of DSDI Local Industry Policy).
- Strategies to foster cross-cultural awareness for the project and its participants
- Direct and indirect impact of the Project on the regional, state and national economies in terms of direct and indirect effects on employment, income and production.

4.7 Air Environment

4.7.1 Description of Environmental Values

This section should describe the existing air environment, which may be affected by the proposal in the context of environmental values as defined by the *Environmental Protection Act 1994* and *Environmental Protection (Air) Policy*.

4.7.2 Potential Impacts and Mitigation Measures

The following air quality issues should be considered:

- Impacts of dust generation from construction activities, especially in areas where the pipeline follows existing road networks or passes in close proximity to residences.
- Identification of climatic patterns that could affect dust generation and movement.
- Predicted changes to existing air quality from vehicle emissions and dust generation along haulage routes.
- Impacts on air quality from gaseous emissions including carbon monoxide (CO), oxides of nitrogen (NOx) from the compression facilities, accidental and planned gas releases, greenhouse gas emissions and ozone depleting substances.

- Amelioration or mitigation measures for each identified impact relating to vehicle emission, dust generation and gaseous emissions should be proposed.

4.8 Noise and Vibration

4.8.1 Description of Environmental Values

Sensitive noise receptors adjacent to the pipeline route and compressor station should be mapped and typical background noise levels discussed. The potential sensitivity of such receptors should be discussed and performance indicators and standards should be nominated for each affected receptor. Current background levels for noise should be surveyed or reported. Noise from the existing compression facility should be measured in sensitive places and used to assist the modelling of predicted noise levels for the new proposal.

4.8.2 Potential Impacts and Mitigation Measures

The following analysis of noise impacts should be assembled:

- The levels of noise generated during construction of the compression facilities, pipeline and ancillary activities (e.g. access roads, camp sites) and operations should be assessed against current typical background levels.
- Cumulative impacts should be taken into consideration in relation to any increase in the size of the compressor station at Moranbah.
- The potential environmental harm of noise and vibration at all potentially sensitive places, in particular, any places of work, residence, recreation, or worship, should be quantified and compared with objectives, standards to be achieved and measurable indicators.
- This should also include environmental harm on terrestrial animals.
- Proposals to minimise or eliminate these effects should be provided, including details of any screening, lining, enclosing or bunding of facilities, or timing schedules for construction and operations that would minimise environmental harm and environmental nuisance from noise.
- Assessment should be made of the potential emission of low-frequency noise (noise with components below 200Hz) from major items or plant or equipment and, if necessary, measures should be described for reducing the intensity of these components.

4.9 Waste

4.9.1 Waste Generation

Identify and describe all sources of waste associated with construction, operation and decommissioning of the pipeline. Describe all activities including:

- Chemical and mechanical processes conducted on the construction sites/camps (e.g. chemical storage, sewage treatment, power generation, fuel burning, mechanical workshop, diesel storage).
- The amount and characteristics of solid and liquid waste produced on-site (compression facilities, pipeline, construction camps) by the Project.
- Any waste treatment process involved, including site drainage and erosion controls.
- Selection criteria, and show on the map likely run off/stormwater discharge points.

- Hazardous materials to be stored and/or used on-site, provide their Material Safety Data Sheets and environmental toxicity data and biodegradability for raw materials and final products.

Descriptions should also include (using maps and plans as appropriate):

- Generation points.
- Storage methods and facilities.
- Quantities.
- Disposal arrangements.
- Recycling/reuse arrangements.

The EIS should provide details of any waste water output[1] including:

- Volume estimates of industrial and domestic effluent that will be produced at each Project site.
- Quality of effluent produced.
- Any mobile sewerage facilities to be used.
- The proposed method of disposal and extent of use of local government facilities (i.e. Council Sewerage works).

4.9.2 Waste Management

Waste management strategies should incorporate measures to avoid waste generation where possible. Discuss waste management strategies, including reduction, reuse, recycling, storage, transport and disposal of waste, including measures to minimise attraction of vermin, insects and pests.

4.10 Traffic, Transport and Access Arrangements

4.10.1 Transport Methods and Routes

With the use of maps and data tables discuss transport methods and routes for delivering compression equipment, pipeline construction and maintenance materials, other necessary goods and consumables and workforce transportation. Information should include:

- Volumes, tonnage, and composition of construction inputs.
- Hazardous or dangerous material that may be transported.
- Method of transport (e.g. sea, rail, road) and the type of vehicles most likely to be used for transport.
- Number and type of workforce traffic and service vehicles.
- Number of trips generated (both light and heavy vehicles).
- Origin and destination of inputs and transport route proposed (with the use of maps). Existing traffic volumes will need to be shown.
- Details of over-dimension, excess mass loads or any hazardous goods.
- Timing and duration of transport.

[1] Potential impacts to any aquifers, underground water flows and surface waters to be traversed by construction of the proposed pipeline should be discussed in Section 4.3.2

Overall, it is important that the EIS clearly and fully describes transport information for all stages of the project including:

- Any new access requirements to State-controlled or local government roads.
- Full details of where the pipe alignment crosses or runs within or close to road and rail reserves.

The EIS should provide sufficient details to allow Main Roads and Queensland Transport to ascertain compliance with legislative and design requirements.

4.10.2 Potential Transport Impacts and Mitigation Measures

It is anticipated that the pipeline route will mostly traverse rural areas. However, the pipeline will need to pass through rural and urban residential land uses in the Gladstone area. The Project will need to examine potential impacts to traffic flow for the entire alignment on all residences and businesses included along the pipeline route.

Assessment of impacts for the entire alignment should discuss the following:

- The likely impacts and mitigation strategies of increased traffic on local and regional road networks (with appropriate directional distributions), with reference to:
    - Traffic volume.
    - Vehicle size and types, including heavy vehicle access.
    - Usage rates.
    - Road safety issues, including safe access to construction sites (e.g. consideration of the need for turning lanes, improved sight lines, waiting areas, off-road parking locations).
    - Reduced efficiency of traffic flows or intersections along key routes, especially during construction.
    - Additional wear/reduced life of pavements requiring additional or accelerated rehabilitation and maintenance if any.
    - Social, amenity, environmental or cultural heritage impacts of transport not covered in other sections.
- The proposed traffic management arrangements and plans, especially within rural residential areas and steps to be taken to prevent public access to construction access ways not provided on public roads.
- Specific issues related to construction phase activities:
    - Site depot location and access.
    - Construction traffic on local road networks, daily movement patterns and emergency access, especially in rural residential areas.
    - Methods to be adopted to avoid obstruction to other road uses during construction
- The likely impact of increased traffic on rail haulage systems.
- Environmental issues relating to transport (e.g. weed management, vegetation clearing in road reserves, dust control and erosion protection) are adequately assessed and ways to ameliorate any adverse impacts are outlined.
- The impacts of construction with regard to seasonal considerations such as potential for road impacts during wet weather.

Findings of studies and assessments should be incorporated into a road management strategy including Transport and Traffic Management Plans.

Reference should be made to any relationship between Project road works and works proposed in the current Road Implementation Program(s) of the Department of Main Roads (DMR). Road infrastructure impacts should be described and assessed according to DMR's *Guidelines for Assessment of Road Impacts of Development Projects (Nov 2000).* Reference should be made to other Main Roads planning documents. These include Statements of Intent for Road Link Development, the Gladstone Integrated Regional Transport Plan 2001 – 2030 (GIRTP), and the Capricornia Integrated Regional Transport Plan 2004 – 2030 (CapIRTP).

It is anticipated that there will be an increase in haulage vehicles transporting sections of pipe via the main service routes. Furthermore, local traffic along shire roads adjacent to the proposed route will increase substantially as a result of construction activity. The Project will need to advise Councils if and when significant increases in vehicle use on minor roads is expected, and discuss rehabilitation strategies.

4.11 Hazard and Risk

4.11.1 Risk Assessment

- The Proponent shall carry out a Risk Assessment in accordance with *AS 2885 Gas and Liquid Petroleum Pipelines* and the guidelines of the responsible authority, where relevant.
- While the EIS must deal comprehensively with on-site risks, it is suggested that external risks to the Project also be considered. It is suggested that external risks from natural hazards be determined on the basis of *AS/NZS Risk Management Standard 4360:1999*.
- The study shall assess risks during the construction, operational and decommissioning phases of the pipeline. Where possible these risks are to be assessed in quantitative terms.
- Indicate possible hazards, accidents, and abnormal events that may arise for the project, both during construction and in operation. This would be expected to include accidental release of gas or other materials, and explosions and fires associated with incidents arising from the compression facilities and pipeline. It may include seismic stability of the pipeline route and the vulnerability of the route to flooding, bushfire, and landslip.
- Analysis shall be conducted of the consequences of each of these events on safety and environmental damage in the Project area, particularly in the vicinity of the pipeline. Safety may include both injuries and death to workers and to the public. Environmental damage includes only direct harm to the environment as a result of pipeline hazards.
- The analysis shall examine the likelihood of these consequences being experienced, both individually and collectively.
- As far as possible quantitative levels of risks and risk contours shall be presented from the above analysis.
- Details are to be provided of the safeguards which will be employed or installed to reduce the likelihood and severity of hazards, consequences and risks to persons, fauna and environmentally sensitive sites along the pipeline route. Where possible indicate the reduced level of risk which would be experienced with these safeguards in place.
- Compare assessed and mitigated risks with acceptable risk criteria for land uses adjacent to the pipeline route locations.

4.11.2 Emergency Management Plan

An outline of the proposed emergency management procedures is to be provided for the range of situations identified in the above risk assessment as providing measurable risks.

The following should also be presented:

- Contingency plans to deal with hydrocarbon (e.g. diesel, lubricating oils) oil spills during construction, operation and maintenance of the pipeline.
- Contingency plans to account for natural disasters such as storms, floods and fires during the construction, operation and maintenance phases.
- Emergency planning and response procedures that have been determined in consultation with State and regional emergency service providers.
- Plans for involvement of the relevant State agencies (such as the Queensland Ambulance Service) in relation to emergency medical response and transport and first aid matters.

5. ENVIRONMENTAL MANAGEMENT PLANS

Draft Environmental Management Plans (EMPs) should be presented in the EIS for construction and for operation, and should detail measures to address impacts identified in this EIS for the respective phase of the Project. EMPs should contain the following:

- Environmental element - the environmental aspect requiring management consideration.
- Potential impacts - as identified in the EIS.
- Performance objective - the target or strategy to be achieved through management.
- Management actions - the strategies and actions to be undertaken to achieve the performance objective, including any necessary approvals, applications, and consultation.
- Performance indicators - criteria against which the implementation of the actions and the level of achievement of the performance objectives will be measured.
- Monitoring - process of measuring actual performance.
- Responsibility - assign responsibility for carrying out strategies and monitoring actions to relevant persons/organisations.
- Reporting - the process and responsibility for reporting monitoring results.
- Corrective action - the action to be implemented in the case of non-compliance and the person/organisation responsible for action.

6. CONCLUSION AND RECOMMENDATIONS

The EIS should make conclusions and recommendations with respect to the proposal, based on the studies presented, the Environmental Management Plans and conformity of the proposal with ESD policy.

7. REFERENCES AND APPENDICES

References should be consistent and in a recognised format. Items in the Appendices may include:

- Site plans.
- Terms of Reference.
- Study Team
- Statutory Permits and Development Approvals.
- Research Reports and Specialist studies.
- List of Proponent Commitments