



Queensland Government

State Development and Innovation

GATEWAY UPGRADE PROJECT

TERMS OF REFERENCE

FOR AN

ENVIRONMENTAL IMPACT STATEMENT

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

16 April 2004

Preamble

Project Proponent

The Department of Main Roads (Main Roads) is a Queensland Government organisation that manages approximately 34,000 kilometres of state-controlled road network. This network carries 80% of Queensland's traffic and includes the highways and other main connecting roads in Queensland.

Project Summary

Main Roads is proposing to construct and operate a duplication of the Gateway Bridge and an upgrade of the Gateway Motorway, between Mt Gravatt - Capalaba Road and Nudgee Road. The Gateway Motorway lies to the east of Brisbane, and connects the Pacific Motorway to the south, the Bruce Highway to the north, and the Logan and Ipswich Motorways to the west. It also services critical regional infrastructure, namely the Brisbane Domestic and International Airports and the Port of Brisbane.

The importance of this link to the road network, and the need for maintaining effective traffic flows in this region, is evidenced in the Integrated Regional Transport Plan (IRTP) for South East Queensland by the following statements, "On a regional basis, ensuring effective access to important economic nodes such as the Port of Brisbane and Brisbane Airport has been a priority", and "Planning is needed for a second river crossing near the Gateway Bridge to support regional travel and freight movements along the corridor."

The proposed upgrade works which will traverse land under the jurisdiction and interest of Local, State and Commonwealth Government Agencies will include the following:

- upgrade mostly within the existing Gateway Motorway alignment between Mt-Gravatt - Capalaba Road and Lytton Road;
- duplication of the Gateway Bridge;
- duplication through realignment of the Gateway Motorway from the Gateway Bridge north to Nudgee Road. This deviation will be through old and new airport land and the upgrade works include a grade separated interchange for direct access to the Brisbane Airport; and
- new bridge structures over Bulimba Creek, Kingsford Smith Drive, the Airport Rail Link, Airport Drive and Kedron Brook.

Administrative Details for these Terms of Reference

Main Roads has prepared an Initial Advice Statement (IAS) that provides further detail relating to the Project.

The Gateway Upgrade Project (GUP) has been declared by the Queensland Coordinator-General (CoG) to be a significant project for which an Environmental Impact Statement (EIS) is required, pursuant to Section 26 of the Queensland *State Development and Public Works Organisation Act 1971* (SDPWO Act).

This Terms of Reference (TOR) document for the EIS has been compiled pursuant to the *State Development and Public Works Organisation Act 1971*.

The TOR provides information in two broad categories:

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

Main Roads submitted a Referral to the Commonwealth Minister for the Environment and Heritage under the Commonwealth *Environment Protection and Biodiversity Conservation*

Act 1999 (EPBC) in November 2003. The Minister decided that the Project was not a controlled action in February 2004.

The section of the Gateway Upgrade Project that traverses Commonwealth land (being the Brisbane Airport) also triggers assessment and approval under the *Airports Act 1996*. Specifically, the project is to be in accordance with the Brisbane Airport Master Plan and a Major Development Plan is to be submitted to the Department of Transport and Regional Services (DoTaRS) for Ministerial approval for non-aviation related development where the cost of construction exceeds \$10 million. Main Roads will conduct an EIS under the SDPWO Act process, and develop a Major Development Plan for submission to DoTaRS based on the information obtained during the EIS process. The EIS is to contain a separate appendix that summarises key issues related to the Brisbane Airport (section 91 of the *Airports Act*).

The abbreviation 'EIS' referred to in this TOR refers to the document(s) lodged in order to satisfy the impact assessment requirements of all relevant State and Commonwealth statutes for this Project.

The Department of State Development & Innovation (DSDI) is the authority responsible for coordinating the assessment of the EIS for this Project.

Commonwealth, State and Local Government Agencies and appropriate authorities have been invited to participate in the EIS process and have been requested to examine the IAS and to comment on the draft TOR. When Main Roads has prepared the EIS to the satisfaction of the Coordinator-General, it will be made available for public review and comment. DSDI will coordinate the consultation process between Main Roads, Advisory Agencies and the public. DSDI will collate and review all comments received on the EIS.

At the conclusion of this process, the CoG will prepare an EIS evaluation Report.

With respect to any development application required by the Project under the *Integrated Planning Act 1997* (IPA), the EIS process under the SDPWO Act:

- replaces the information and referral stage and the notification stage under the Integrated Development Assessment System (IDAS) of the IPA (i.e. there are no concurrence agencies);
- means that the CoG's evaluation Report is taken to be the concurrence agency's response under IDAS; and
- provides that submissions received in relation to the EIS are taken to be 'properly made submissions' under the IPA.

The CoG's evaluation Report may state for the assessment manager one or more of the following:

- the conditions that must attach to any development approval;
- that the development approval must be for part only of the development; and
- that the approval must be a 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 the development approval must be refused.

Where another act (for example *Environmental Protection Act 1994*) requires the preparation of an EIS, or similar statement to address the environmental effects for the Project, this EIS can be taken as a statement satisfying those requirements. Where approval is required

under another Act, the CoG's evaluation 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 be imposed on the approval.

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

The DSDI contact for coordination of the EIS evaluation process will be:

Project Manager – EIS Gateway Motorway Upgrade Project
Project Delivery Branch
Department of State Development & Innovation
PO Box 168
BRISBANE ALBERT STREET QLD 4002
Tel: (07) 3224 2748 Fax: (07) 3225 8282

Alternatively, the Department of Main Roads contact for the Gateway Upgrade Project will be:

Director (Planning and Technical)
Gateway Upgrade Project
Department of Main Roads
PO Box 70
SPRING HILL QLD 4004
Tel: (07) 38348236 Fax: (07) 38348363

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PART A – INFORMATION AND ADVICE ON THE PREPARATION OF THE EIS

1 INTRODUCTION

This TOR for an EIS for the Gateway Upgrade Project has been developed in accordance with the requirements of the *State Development and Public Works Organisation Act 1971*.

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 IAS.

Any feasible alternatives should be discussed and reasons for selection of the preferred option should be clearly identified. The nature and level of investigations should be relative to the likely extent and severity of impacts. The Commonwealth and State Governments, from which the Project Proponent requires approvals, may request additional information on any matter not adequately dealt with in the report. The Proponent is required to contact relevant government agencies and peak bodies representing particular areas of interest in the wider community to clarify the required nature and level of investigations.

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.

The EIS documentation and reports are to be cross-referenced to the TOR via a table of references. In addition, a quality control document sheet that includes revision/checking history, distribution, organisational details, title and author/s is to be included before the table of contents page.

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. Where unavoidable, impacts (direct, indirect and cumulative) must be examined fully and remedial measures described, so that the development of the Project, including the selection of the preferred motorway alignment, is based on sound economic, social and environmental protection and management criteria. Consistent with this objective, the EIS should be a stand-alone 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 it would affect, 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 identification of the impacts of the proposed Project on that land, including access, and the measures to be taken to mitigate all adverse impacts; and
- for the CoG and other Government decision makers, a framework against which decision-makers can:
 - consider the economic, social and environmental aspects of the 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 economic, social and environmentally sound development; and
- where required by legislation, recommend an environmental management and monitoring program.

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

3 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, social, economic and built environment (including existing infrastructure). 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 state the criteria adopted in assessing the Project and its impacts, such as compliance with relevant legislation, policies, standards, community acceptance and maximisation of economic, social and 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.

The EIS should relate to the entire life of the Project. The EIS should identify reasonable economic and technically achievable measures 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 economic, social and environmental values caused by the Project. The cumulative impacts of the Project must be considered 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 watersheds affected by the Project and other Projects competing for use of the local air and watersheds.

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.

All uncertainties in the assessment and assumptions made should be clearly stated. 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 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. Should Main Roads 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 motorway corridor and ancillary works including supporting infrastructure.

A listing of all Advisory Agencies for the EIS process should be provided in the EIS.

Copies of the prepared EIS should be lodged with DSDI for distribution for comment and review during the public review period. In addition, an electronic version of the EIS is to be accessible through the DSDI and Main Roads Internet sites. Copies of the EIS should also be prepared for distribution to relevant libraries and other key Government offices. Documents are to be made available in both CD ROM and hard copy format. Further advice on arrangements for public review will be provided closer to the date.

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 ADVISORY AGENCY CONSULTATION

To facilitate the assessment process, the Department of Main Roads is to regularly consult with Advisory Agencies and other appropriate stakeholders throughout the conduct of the EIS. The purpose of this consultation will be in part to identify legislation, policies and methodologies relevant to the assessment of the proposed motorway upgrade.

Advisory Agencies should include but are not limited to:

- Department of Aboriginal and Torres Strait Islander Policy
- Department of Communities
- Department of Emergency Services
- Department of Employment and Training
- Department of Housing
- Department of Industrial Relations
- Department of Local Government, Planning, Sport and Recreation
- Department of Natural Resources, Mines and Energy
- Department of the Premier and Cabinet
- Department of Primary Industries and Fisheries
- Environmental Protection Agency
- Department of Public Works
- Queensland Health
- Queensland Police Service
- Queensland Transport
- Queensland Treasury
- Department of Environment & Heritage (Commonwealth)
- Department of Transport and Regional Services (Commonwealth)
- Brisbane City Council
- Brisbane Airport Corporation Limited

5 GENERAL STYLE AND FORMAT

The EIS should be written so that any conclusions reached can be independently assessed. This means that all sources must be appropriately referenced. The EIS should be written in a format matching the TOR or include guidelines (preferable as an appendix) describing how the EIS responds to the TOR. As per the TOR, the EIS is to include an Environmental Management Plan (EMP).

The EIS should also include appendices containing:

- a copy of the TOR;
- a consultation report that lists the persons and agencies consulted during the EIS;
- the names of, and work done by, all personnel involved in the preparation of the EIS; and
- the detailed specialist studies that support the main EIS document.

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 4 MB 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.

6 TOR GLOSSARY

The following abbreviations have been used in this document:

CoG – the Coordinator-General of the State of Queensland;

DES – Department of Emergency Services

DNRM&E – the Queensland Department of Natural Resources, Mines and Energy;

DSDI – the Queensland Department of State Development and Innovation;

DPI – the Department of Primary Industries and Fisheries;

EIS – Environmental Impact Statement;

EMP – Environmental Management Plan;

EPA – Environmental Protection Agency;

EPBC Act - *Environment Protection and Biodiversity Conservation Act 1999*;

IAS – Initial Advice Statement as defined by Part 4 of the *State Development and Public Works Organisation Act 1971*;

SDPWO Act – *State Development and Public Works Organisation Act 1971*; and

TOR – Terms of Reference as defined by part 4 of the *State Development and Public Works Organisation Act 1971*.

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 by interested parties who may not wish to read 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 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 its commitment to effective environmental management;
- a concise statement of the aims and objectives of the Project;
- the legal framework, decision-making authorities and involved agencies;
- a discussion of the background to, and need for, the Project, including the consequences of not proceeding with the Project;
- a discussion 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 economic, social and environmental impacts predicted and proposed management strategies and commitments to minimise the significance of adverse 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 also define the audience to whom it is directed and contain an overview of the structure of the document.

1.1 The Proponent

This section describes the Proponent (i.e. Main Roads) in terms that are relevant to the proposed upgrade works. The section should outline the experience of the Proponent, including the nature and extent of business activities and the Proponent's environmental record and Environmental Policy.

1.2 Purpose of the EIS

Summarise the role and purpose of the EIS document including compliance with regulatory requirements, reference to the TOR and any complementary or subsequent documentation (i.e. technical background papers).

The audience should be able to distinguish the EIS as the key environmental document providing information to decision makers considering approvals for the Project.

1.3 The Environmental Impact Statement Process

Provide an explanation of the legislative process under which the EIS is being produced, including timing and decisions to be made for relevant stages of the project.

The explanation should include a description of the approval process as a significant project pursuant to the SDPWO Act and a Major Development Plan (MDP) under the Airports Act. The linkages between relevant State and Commonwealth legislation should also be identified.

This section should also outline mechanisms in the process for public input, the public release of the EIS and MDP and the responses to stakeholder submissions. Readers should be informed as to how submissions on the EIS and MDP will be addressed.

1.4 The Public Consultation Process

An appropriate public consultation program, developed in accordance with the requirements under the SDPWO Act is essential to the full conduct of the impact assessment.

The aims of the public consultation process are to:

- Consider stakeholder views on the proposed project with a view to achieving the most acceptable outcomes;
- Identify and manage issues that are highlighted by community stakeholders and which may impact upon the Gateway Upgrade Project; and
- Keep the community, key stakeholders and appropriate agencies informed of project progress.

Based on best practice principles, consultation processes should:

- be undertaken as early as possible in the environmental impact assessment process, underpin each phase, including feedback to participants about outcomes; and
- be designed in two stages; (i) identifying broad issues of concern and providing information to the community and specific interest groups; and (ii) providing for focussed, detailed consultation to consider issues, resolve conflicts, and to develop mitigation or monitoring strategies with the input of interested parties.

This section should outline the methodology that will be adopted to identify and mitigate socio-economic impacts that may arise from the project.

Information about the consultation that has already taken place and the results of such consultation should be provided. A list of affected persons and interested stakeholders as well as information on consultation with these persons is to be provided.

The public consultation program should provide ongoing opportunities for community involvement and education. It may include public meetings, interest group meetings, production of regular summary information and updates and other consultation mechanisms as required that would encourage and facilitate active public consultation.

It is recommended that a Table of Consultation Findings be provided in the EIS, either as an appendix to, or included in, the EIS. The table should identify all the groups, agencies, and people who have been consulted, the issues they raised and the strategies put into place to resolve these concerns and or enhance particular positive impacts.

2 BACKGROUND AND PROJECT RATIONALE

This section is to provide the justification for the project, with particular reference made to economic and social benefits, including employment and spin-off business development. This section should also describe feasible alternatives, including conceptual, technological and locality alternatives to the Project and include discussion of the consequences of not proceeding with the project.

2.1 Background

The background leading to the project proposal should be provided. It should include the political and government context as well as some general information about the Project in the local and regional context.

2.2 Need for the Project

State the objectives that have led to the development of the Project. Outline the events leading up to the Project's formulation, including alternatives, envisaged time scale for implementation and project life, anticipated establishment costs and action already taken within the Project area.

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

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

- the strategic, economic and environmental implications of the Project;
- the need for the project based on studies including modelling of existing and projected traffic volumes;
- compliance with the Integrated Regional Transport Plan for South East Queensland;
- the short-term and long-term strategic implications of the Project in terms of the local and regional road network and the demands on infrastructure arising from new proposals; and
- the Project's compatibility with National guidelines and standards.

2.3 Costs and Benefits of the Project to the Wider Community

This section is to discuss the following:

- the economic costs and benefits to industry and the wider community; and
- the regional social impacts including employment and skills development (training) required directly for the Project and indirectly for any ancillary works to the Project.

Employment and Skills Development Impact Statement (ESDIS) guidelines are available from the Department of Employment and Training. The ESDIS guidelines state that any

projects with direct expenditure of more than \$100m should also include Office of Economic and Statistical Research modelling of the economic/ employment impacts of the project.

2.4 Options Analysis

This section is to provide a description of the various road alignment and configuration options that were assessed in the Gateway Motorway and Second River Crossing Planning Study to determine the preferred alignment. Options should be discussed in sufficient detail to enable an understanding of the reasons for selecting the preferred alignment option and rejecting others. Reasons for selecting the preferred alignment should be delineated in terms of technical, commercial, social and natural environment aspects. The alternative of taking no action should also be discussed.

Relevant illustrations, maps and drawings that show the location of the assessed alignment options in the local and regional context should accompany this section.

3 PROJECT DESCRIPTION

The objective of this section is to describe the Project through its lifetime. This information is required to allow assessment of all aspects of the life of the Project including all phases of the Project from planning, construction, decommissioning of the construction site and long-term operation.

3.1 Motorway Upgrade Works

A detailed description of the Gateway Upgrade Project is to be provided including:

- a preliminary predictive program of activities relating to design, delivery and operational activities. The description should also state the design life and the expected operating life of the Project;
- potential construction lay-down areas, off site/on-site prefabrication areas including potential locations for casting facilities, vehicle/construction equipment storage/ workshops, and parking facilities for the construction workforce.
- design parameters including, horizontal and vertical alignment, representative cross-sections, pavement type and thickness, bridges, embankments, cuttings (if any), predicted traffic volumes / capacity and design life;
- estimates of material quantities and likely sources for this material. This should include but not be limited to bridges, culverts, fill material, pavement (concrete, bitumen, etc);
- details of the design criteria applied for road and bridges;
- the preferred motorway alignment, with the aid of maps and diagrams, describing the location of:
 - on and off ramps, intersections and interchanges;
 - sections on embankments and bridged sections;
 - location of electronic tolling facilities; and
 - works within and outside of the existing road reserve.
- criteria to be used to locate any access for machinery, transport etc. in the vicinity of a waterway or wetland (e.g. construction of causeways, bridges, culvert crossings etc.) and any permanent access points, roads or sidetracks for maintenance purposes, in

particular where they are adjacent to waterways or wetlands; recreation and sport facilities; and parkland. Describe the nature of any permanent access points; and

- road reserve widths and access requirements along the alignment including the use of existing areas of disturbance for machinery access and future maintenance.

3.2 Other Infrastructure Requirements

3.2.1 Transport

The EIS should clearly and fully describe all transport requirements for the construction and operational phases. This should include:

- the likely types of vehicles to be used;
- likely scenarios for origin and destination of inputs/supply source and likely transport routes;
- an assessment of the likely impacts on the adjacent road network;
- hazardous or dangerous material that maybe transported to or from the site both during construction and operation; and
- potential access requirements.

3.2.2 Workforce and Other Infrastructure

The EIS should provide information on the likely size of the workforce required during construction and any infrastructure required to accommodate this workforce. The information should show anticipated periods of peak construction activity and downtimes with corresponding workforce numbers.

3.3 Waste Management

Having regard for best practice waste management strategies and the Environmental Protection (Waste) Policy, details of application of the principles of waste avoidance, reuse, recycling, treatment and disposal should be described for the construction, operation and maintenance phases of the project.

3.4 Permits, Licenses and Environmental Authorities

This section should discuss the permits, licenses and environmental authorities relevant to the project. The section should identify the legislative act under which the permit, license and/or environmental authority is required, together with the administering authority, the trigger mechanism and the party expected to be responsible for obtaining the permit, license and/or environmental authority. All relevant international conventions, Commonwealth and State legislation should be considered and the Main Roads Environmental Legislation Register may be used for reference, though additional sources should also be investigated.

3.5 Rehabilitation of Construction Site

This section should present the strategies and methods for progressive and final rehabilitation of the environment disturbed during construction. Final rehabilitation of the construction site

should be discussed in terms of ongoing land use suitability, management of any residual contaminated land and any other land management issues.

4 ENVIRONMENTAL VALUES AND MANAGEMENT OF IMPACTS

This section should provide information on the natural, social, cultural, economic and built environment in the vicinity of the Project (the study area).

Detailed descriptions of the existing environment should be provided followed by an assessment of the potential impacts on this environment during the construction and operational phases. The formulation of high-level environmental protection measures to mitigate adverse impacts is also required. Baseline information from other relevant studies should be used and referenced where appropriate.

The functions of this section of the EIS are:

- to describe the existing environmental values of the study area. Environmental values should be described by reference to background information and studies, which may be included as appendices to the EIS;
- to describe the potential adverse and beneficial impacts of the proposed works on the identified environmental values. Any likely environmental harm on the environmental values should be described. Analysis of any cumulative impacts on environmental values caused by the Project should also be included; and
- to present high-level environmental protection measures to mitigate identified impacts. Environmental protection measures may be derived from legislative and planning requirements that apply to the project including Commonwealth strategies, the Airports Act 1996, the Airports (Environment Protection) Regulations 1997, the Airports (Building Control) Regulations 1997, State Planning Policies, Local Authority Strategic Plans, Environmental Protection Policies under the *Environmental Protection Act 1994*, and any catchment management plans. Special attention should be given to those mitigation strategies designed to protect the values of any sensitive areas including the Moreton Bay Ramsar wetland, habitat for migratory wader birds and any identified ecosystems of high conservation value.

Environmental protection strategies and measures identified as necessary in this section should be cross-referenced to Section 5 (Environmental Management Plan) to ensure that such measures have been appropriately addressed.

This section should address all elements of the environment (such as geology, soils, water, air, waste, noise, cultural heritage, social and community) in a way that is comprehensive and clear. To achieve this, the following issues should be considered for each environmental element relevant to the project (complete list of environmental elements to address is provided in Sections 4.1 to 4.19):

- **description of existing environment:** describe the existing environmental values of the study area to be affected including values and areas that may be affected by any cumulative impacts;
- **potential impacts:** describe the actual and potential direct and indirect impacts of the proposed works on the identified environmental values. The cumulative impacts of the project must also be considered; and
- **mitigation measures:** describe the mitigation measures to be implemented to ameliorate identified impacts. These measures are to be best practice and should include proposed indicators to monitor the success or failure of the mitigation measure. The measurable indicators and standards can be determined from legislation, support policies, government

policies, published literature as well as the predicted performance of the control strategies as determined by a suitably qualified assessor. Details are required to assure the reader that the expected performance is achievable and realistic.

Potential impacts and mitigation measures for each environmental element may be discussed in the EIS in one section (as listed below) or in separate sections. It is preferred however to discuss the existing environment, potential impacts and mitigation measures for each environmental element in the same chapter (rather than cross-referencing different chapters in the EIS).

4.1 Land Use and Planning

4.1.1 Description of Existing Environment

This section should describe the existing land uses within the study area and the planning framework of the proposed works. The following issues should be addressed:

- identify current land use within and adjacent to the area of proposed project;
- identify various tenures of the study area, in particular areas subject to Native Title. A summary report on Native Title should be provided in the EIS as an Appendix;
- identify current planning designations within and adjacent to the area of proposed works as per the Brisbane City Plan;
- determine compatibility of the Project with the desired intent of the planning scheme as per the relevant planning scheme provisions;
- compatibility with the SEQ Regional Framework for Growth Management 2000 and compliance with other regional documents including the Integrated Regional Transport Plan for South East Queensland and Transport 2007;
- identify planning designations in the Brisbane Airport Master Plan and their implications for the road project and consider requirements under the State Planning Policy (SPP) 1/02: Development in the Vicinity of Certain Airports and Aviation Facilities;
- discuss the Project in relation to the Brisbane River Management Plan strategies and other relevant local management plans; and
- identify and assess potential changes in land use during construction and operation phases of the Project.

4.1.2 Potential Impacts and Mitigation Measures

This section should discuss the potential impacts of the Project on existing land use including an assessment of the implications that the road project may have on the planning intentions for Brisbane Airport and discuss the compliance of the project with relevant planning policies and provisions.

In assessing the implications of the road project on the planning intentions for Brisbane Airport, outline any constraints or limitations that the motorway may impose on future airport development intentions outside of the road corridor. Any impacts that involved setbacks from elevated road embankments, limitations on height or scale of buildings or constraints on any on-airport road upgrade works particularly at the Lomandra Drive/Airport Drive intersection would need to be determined.

The EIS should address any impact on existing residential development in the vicinity of the Gateway Motorway that will arise from the project's construction and operation. This

assessment should include any possible land resumptions, feeder street closures or widening, and construction of noise barriers adjacent to residential areas.

4.2 Topography/Geomorphology/Geology

4.2.1 Description of Existing Environment

This section should include descriptions and maps of the topographical, geomorphologic and geological features of the project area including:

- the topography of the site with contours shown at suitable increments, shown with respect to Australian Height Datum (AHD);
- landforms of the site and surrounding areas, including an analysis of subsurface and slope stability where appropriate (landform patterns and elements should be described using the standardised classification of the Australian Soil and Land Survey Field Handbook, McDonald et al, 1990);
- significant geological and landform features;
- potential economically significant mineral, energy and extractive material resources;
- the geology of the wider Project area, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures; and
- hazards such as geological faults and unstable areas.

4.2.2 Potential Impacts and Mitigation Measures

The potential impacts on the topography, geomorphology and geology of the site in the local and regional context should be discussed. This should include discussion of the degree and nature of change to the existing landform features.

A contour map of the area should be provided pre- and post-construction. Also, the final drainage system should be discussed and comparisons made between pre- and post-construction (see also Section 4.4 of these TOR).

4.3 Soils

4.3.1 Description of Existing Environment

A soil survey of the sites affected by the Project should be conducted at a suitable scale, with particular reference to the physical and chemical properties of the materials that will influence erosion potential, stormwater run-off quality and site stability. A preliminary acid sulphate soil investigation should be undertaken in areas below 5m AHD to be disturbed by the Project. Information should also be provided on soil stability and suitability for construction of proposed facilities. A Site Based Management Plan will need to be produced to incorporate management of actual and potential acid sulphate soils, surface water and groundwater in accordance with the relevant policies and guidelines referenced in Section 9 - TOR References.

Guidelines for the number of observation sites for land resource (soil) assessment of the area affected by the proposed development should be conducted at a scale of 1:25000.

Full soil profiles and landform descriptions should be described according to the Australian Soil and Land Survey Field Handbook (McDonald et al, 1990) and Australian Soil Classification (Isbell, 1996).

An appraisal of the depth and quality of useable soil should be undertaken. Information should be presented according to the standards required in the Planning Guidelines: the Identification of Good Quality Agricultural Land (DPI, DHLGP, 1993) and the State Planning Policy 1/92: Development and the Conservation of Agricultural Land.

4.3.2 Potential Impacts and Mitigation Measures

Detailed descriptions of the potential impacts and mitigation measures on soils, including erosion risk, topsoil and rehabilitation potential, acid sulphate soils and contaminated land, are required.

Erosion risk

For all permanent and temporary land forms, possible erosion rates and management techniques should be described. For each soil type identified, erosion potential (wind and water) and erosion management techniques should be outlined. Mitigation strategies should be developed to achieve acceptable soil loss rates, levels of sediment in rainfall runoff and wind generated dust concentrations.

The report should include an assessment of likely erosion effects, especially those resulting from the removal of vegetation, both on-site and off-site for all disturbed areas.

Strategies to prevent or control erosion should be specified and should be developed with regard to preventing soil loss in order to maintain land capability/suitability and preventing significant degradation of local waterways by suspended solids.

Topsoil and rehabilitation potential

Strategies for the management of topsoil across the project area are to be provided. This should include descriptions of topsoil stripping, stockpiling and replacement. The minimisation of topsoil storage times (to reduce fertility degradation) should also be addressed.

Acid sulphate soils

The EIS should outline strategies to manage acid sulphate soils based on assessment in accordance with the State Planning Policy 2/02 - Planning and Managing Development involving Acid Sulphate Soils, EPA's 2001 Instructions for the Treatment and Management of Acid Sulphate Soils and the DNRM&E's 2002 Queensland Acid Sulphate Soils Technical Manual - Soil Management Guidelines.

Contaminated land

The EIS should outline strategies to address the potential environmental impacts associated with disturbance to any existing contaminated land and possible contamination of land from aspects of the project including waste, reject product and spills at chemical and fuel storage areas.

Strategies to prevent land contamination (within the meaning of the *Environmental Protection Act*) should be provided. Proposals for preventing, recording, containing and remediating any contaminated land should be outlined.

4.4 Hydrology

4.4.1 Description of Existing Environment

A description should be given of the watercourses in the area affected by the Project with an outline of the significance of these waters to the river / creek catchment system in which they occur. Details provided should include a description of existing drainage patterns, and flows in major watercourses and wetlands. Also provide details of the likelihood of flooding, history

of flooding including extent, levels and frequency and a description of present and potential water uses downstream of the areas affected by the Project.

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

- values identified in the Environmental Protection (Water) Policy;
- sustainability, including quantity; and
- physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form.

4.4.2 Potential Impacts and Mitigation Measures

This section is to define the potential impacts of the project on the water environment, to outline strategies for protecting water resource environmental values, how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives may be monitored, audited and managed.

The EIS should describe the possible environmental harm caused by the proposed works to environmental values for water as expressed in the Environmental Protection (Water) Policy.

Water management to address surface water quantity, drainage patterns and sediment movements should be outlined. Key water management strategy objectives include:

- maintenance of sufficient quantity of surface waters to protect existing beneficial downstream uses of those waters (including maintenance of in-stream biota and downstream wetlands including the Moreton Bay Ramsar wetland);
- protection of important local groundwater aquifers; and
- measures proposed to avoid or minimise afflux resulting from changes to drainage.

Reference should be made to the State Planning Policy (SPP) 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide.

4.5 Groundwater

4.5.1 Description of Existing Environment

The EIS should review the quality, quantity and significance of groundwater in the Project area, together with groundwater use in neighbouring areas. The depth to groundwater should be identified, as should any Declared Groundwater Areas.

The groundwater assessment should take into account the findings of the acid sulphate soils assessments as per Section 4.3.

The environmental values of the groundwater should be described in terms of:

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

4.5.2 Potential Impacts and Mitigation Measures

The EIS should include an assessment of the potential environmental harm caused by the project 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 project and the significance of the project to groundwater depletion or recharge. The assessment should take into account the potential impact of the project on the local groundwater regime caused by the altered porosity and permeability of any land disturbance. Management options available to monitor and mitigate these effects should be provided.

4.6 Surface Water Quality

4.6.1 Description of Existing Environment

A description should be given of the watercourses in the area affected by the Project with an outline of the significance of these waters to the river / creek catchment system in which they occur. Details provided should include a description of water quality in major watercourses and wetlands.

An assessment is required of existing water quality in surface waters and wetlands likely to be affected by the Project. The assessment should provide the basis for a long-term monitoring program, with sampling stations located upstream and downstream of the Project.

The water quality should be described, including seasonal variations or variations with flow, where applicable. A relevant range of physical, chemical and biological parameters should be measured to gauge the environmental harm on any affected watercourse or wetland system.

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

- values identified in the Environmental Protection (Water) Policy;
- sustainability, including quality; and
- any Water Resource Plans, Land and Water Management Plans (including the Brisbane River Management Plan and other local authority stream management initiatives) relevant to the affected catchment.

4.6.2 Potential Impacts and Mitigation Measures

This section is to define the potential impacts of the project on the water environment, to outline strategies for protecting water resource environmental values, how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives may be monitored, audited and managed.

The EIS should describe the possible environmental harm caused by the proposed works to environmental values for water as expressed in the Environmental Protection (Water) Policy.

Water management to address surface water quality, quantity, drainage patterns and sediment movements should be outlined. Key water management strategy objectives include:

- maintenance of sufficient quantity and quality of surface waters to protect existing beneficial downstream uses of those waters (including maintenance of in-stream biota and downstream wetlands including the Moreton Bay Ramsar wetland);

- protection of important local groundwater aquifers; and
- measures proposed to avoid or minimise afflux resulting from changes to drainage patterns.

The potential environmental harm to the quality of surface waters from all phases of the project should be discussed, with particular reference to their suitability for the current and potential downstream uses, including the requirements of any affected riparian area, the Ramsar wetland, estuary, littoral zone and any marine and in-stream biological uses.

Principles that would provide for the management of runoff from the bridge and associated roadways during construction and operation should be provided. The impacts of surface water flow on adjoining sites and on existing and proposed infrastructure should be considered. Reference should be made to the Environmental Protection (Water) Policy, *Water Act 2000* and the Australian and New Zealand Environment and Conservation Council (ANZECC) 2000 guidelines.

Options for mitigation and the effectiveness of mitigation measures should be discussed with particular reference to sediment, acidity, salinity and other emissions of a hazardous or toxic nature to human health, flora or fauna.

4.7 Air Quality

4.7.1 Description of Existing Environment

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 (eg. temperature inversions) that may affect air quality within the environs of the Project. 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. The potential for climate change and sea level rise should be described over the life of the Project. Information about trends in changing climate patterns at a state and regional level is available from the Queensland Centre for Climate Change, Department of Natural Resources and Mining.

This section is to describe the existing air environment that may be affected by the proposed works in the context of environmental values as defined by the *Environmental Protection Act 1994* and Environmental Protection (Air) Policy.

A description of the existing airshed environment should be provided having regard for particulates, gaseous and odorous compounds. The background levels and sources of suspended particulates and any other major constituent of the air environment, including greenhouse gases, which may be affected by the proposed works, should be discussed.

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

Discussion should also be provided regarding relevant protocols, agreements and strategies for Greenhouse Gas. This may include reference to the National Greenhouse Strategy, National Greenhouse Gas Inventory, the Kyoto Protocol and the Framework Convention on Climate Change.

4.7.2 Potential Impacts and Mitigation Measures

Climatic conditions contribute risk of impacts to other environmental elements discussed in the EIS. For example, wind speeds influence dust generation and therefore air quality, while rainfall influences erosion risk.

Therefore, impacts and mitigation measures related to climate should be discussed in the sections of most relevance.

This section is to define the potential impacts of the project on the air environment, to describe the objectives and practical measures for protecting or enhancing air quality, to describe how nominated quantitative standards and indicators may be achieved.

The objectives for air emissions should be stated in respect of relevant standards (ambient and ground level concentrations), emission guidelines and legislation and the emissions modelled using a recognised atmospheric dispersion model.

The predicted levels of emissions should be compared with the current national, State and local authority guidelines. The predictions should be made for both normal and expected maximum emission conditions and the worst case meteorological conditions should be identified and modelled where necessary. Ground level predictions should be made for any residential, industrial and agricultural developments believed to be sensitive to the effects of predicted emissions. The techniques used to obtain the predictions should be referenced and key assumptions and data sets explained.

4.8 Noise and Vibration

4.8.1 Description of Existing Environment

This section should describe the existing environmental values that may be affected by noise and vibration from the Project in the context of environmental values as defined by the *Environmental Protection Act 1994* and Environmental Protection Policies. Compliance of the Project with the guidelines and standards in the Main Roads Road Traffic Noise - Code of Practice should also to be determined.

If the proposed activity could adversely impact on the noise environment, baseline monitoring should be undertaken at a selection of sensitive sites affected by the proposed works. Noise sensitive places are defined in the Environmental Protection (Noise) Policy 1997. The locations of sensitive sites should be identified on a map at a suitable scale. The results of any baseline monitoring of noise and vibration in the proposed vicinity of the Project should be described.

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 night. Monitoring methods should adhere to relevant Environmental Protection Agency Guidelines and Australian Standards, and any relevant requirements of the Environmental Protection (Noise) Policy 1997.

Comment should be provided on any current activities near the project area that generate elevated noise and vibration background levels.

4.8.2 Potential Impacts and Mitigation Measures

This section is to define the potential impacts of the project on existing noise and vibration levels, to identify proposed mitigation measures to mitigate identified impacts and to provide recommendations for future monitoring (if required).

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 in terms of objectives, standards to be achieved and measurable indicators. This should also include potential impact on avifauna, particularly migratory bird species.

Strategies to minimise or eliminate noise and vibration impacts should be provided.

4.9 Terrestrial Flora

4.9.1 Description of Existing Environment

This section should discuss the terrestrial flora for the study site in relation to vegetation communities, native species and weed species.

A map of the terrestrial vegetation communities should be provided at a suitable scale for the Project area. Map unit descriptions should correspond to the Environmental Protection Agency's regional ecosystem classifications. Sensitive or important vegetation types should be highlighted and their value as habitat for conservation of rare and threatened flora species or community types.

The description should contain a review of published information regarding the significance of the vegetation to conservation, recreation, scientific, educational and historical interests.

The existence of rare and threatened species under Commonwealth and State legislation should be addressed. This should include lists of all rare and threatened flora species for the wider project area as identified from relevant databases and published literature and an indication as to whether each species is present, or likely to be present, within the project area.

The terrestrial vegetation communities within the affected areas should be described at an appropriate scale (i.e. 1:10,000) with mapping produced from aerial photographs and ground truthing, showing the following:

- location and extent of vegetation types using the EPA's regional ecosystem classifications in accordance with The Conservation Status of Queensland's Bioregional Ecosystems (Sattler P.S. & Williams R.D. 1999) or the EPA's Regional Ecosystem Description Database (REDD) for updated regional ecosystem descriptions;
- location and extent of 'endangered', 'of concern' and 'no concern at present' regional ecosystems with discussion of conservation status provided as per the *Vegetation Management Act 1999*, the findings of any Regional Management Plan, the EPA's Regional Ecosystem Description Database biodiversity status and the Brisbane City Council Natural Assets Planning Scheme Policy;
- location of species afforded additional protection under Commonwealth and State legislation and those species identified as significant flora species as per the Brisbane City Council Natural Assets Planning Scheme Policy; and
- any plant communities of cultural, commercial or recreational significance should be identified.

Detailed methodologies and a flora species list should be provided as an appendix to the report. A list of those native flora species suitable for revegetation is also to be provided. Revegetation species need to be assessed against the risk to aircraft movement due to the potential attraction to avifauna.

The EIS should describe the existing environmental values for nature conservation that may be affected by the project. These should include:

- integrity of ecological processes, including rare and threatened species;

- conservation of resources;
- biological diversity, rare and threatened species;
- integrity of landscapes and places including wilderness and similar natural places; and
- terrestrial ecosystems.

The EIS should identify issues relevant to sensitive areas, or areas that may have low resilience to environmental change. The proximity of any Project Infrastructure to any biologically sensitive areas should be described.

4.9.2 Potential Impacts and Mitigation Measures

This section is to define and describe the potential impacts of the Project on terrestrial flora and provide mitigation measures to minimise or avoid such impacts.

The discussion should cover all likely direct and indirect environmental harm on flora. Strategies for protecting any rare and threatened vegetation communities or species should be described, including any obligations imposed by State or Commonwealth legislation or local government policy.

The potential environmental harm to the ecological values of the area affected arising from the construction, decommissioning of the site and operation 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. Any departure from no-net-loss of ecological values should be detailed.

The potential impact on flora from any alterations to the surface and ground water environment should be discussed with specific reference to potential impacts on riparian vegetation, wetlands and other sensitive vegetation communities.

4.10 Terrestrial Fauna

4.10.1 Description of Existing Environment

The terrestrial fauna occurring or likely to occur within the wider project area should be described, noting the broad distribution patterns in relation to vegetation. 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 and mammals (including microchiropteran bats);
- habitat requirements and sensitivity to changes, including movement corridors and barriers to movement;
- the existence of feral or exotic animals; and
- existence of any rare and threatened or otherwise noteworthy species as per International Treaties, Commonwealth and State legislation and the Brisbane City Council Natural Assets Planning Scheme Policy;
- discussion should be provided on the range, habitat, breeding, feeding and movement requirements and current level of protection of all rare and threatened species identified from relevant fauna database searches of the wider project area.

Detailed methodologies and a fauna species list should be provided as an appendix to the report. Where practical, surveys are to be conducted at an appropriate time of the year to

maximise species detection, particularly for migratory species afforded additional protection under the EPBC Act.

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

The EIS should describe the existing environmental values for nature conservation that may be affected by the project. These should include:

- integrity of ecological processes, including habitats of rare and threatened species;
- conservation of resources; and
- biological diversity, including habitats of rare and threatened species.

The 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 EIS should identify issues relevant to sensitive areas, or areas that may have low resilience to environmental change. The proximity of any Project infrastructure to any sensitive habitat areas should be described.

4.10.2 Potential Impacts and Mitigation Measures

This section is to define and describe the potential impacts of the project on terrestrial fauna and provide mitigation measures to minimise or avoid such impacts.

The discussion should cover all likely direct and indirect impacts on fauna species and their habitats. Strategies for protecting any rare and 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.

Short-term and long-term effects should be considered with comment on whether the effects are reversible or irreversible. Mitigation measures should be proposed for adverse impacts to species and fauna habitat, including loss of habitat, barriers to fauna movement and feeding and breeding patterns. Impacts and mitigation measures as they affect aircraft movement should be discussed.

The principles and objectives for facilitating safe fauna movement should be developed in accordance with published literature including the Main Roads publication, 'Fauna Sensitive Road Design: Volume 1 - Past and Existing Practices'.

4.11 Aquatic Biology

4.11.1 Description of Existing Environment

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

A description of the habitat requirements and the sensitivity of aquatic flora and fauna species to changes in flow regime, water levels and water quality in the Project area are to be provided.

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

- fish species, marine mammals and reptiles and aquatic invertebrates;
- any rare and threatened marine species and the occurrence, or likely occurrence, of their habitat in the wider project area;

- aquatic plants;
- aquatic and benthic substrate; and
- habitat downstream of the project or potentially impacted due to currents in associated lacustrine and marine environments.

4.11.2 Potential Impacts and Mitigation Measures

This section is to define and describe the potential impacts of the project on aquatic flora and fauna (including aquatic invertebrates) and provide mitigation measures to minimise or avoid such impacts.

Detailed descriptions are required on the potential for the project to directly or indirectly impact the values of downstream aquatic environments, including the Moreton Bay Ramsar wetland.

This section of the EIS should also include discussion on the following:

- the potential impact on aquatic biology associated with any alterations to the local surface and ground water environment;
- the potential for, and mitigation measures to prevent, the creation of new mosquito breeding sites during construction and operation; and
- potential impacts on fish movement and fish spawning or recruitment areas from any permanent or temporary structures or stream diversions.

4.12 Cultural Heritage

4.12.1 Description of Existing Environment

The EIS should describe the existing environmental values for cultural heritage that may be affected by the Project activities. This assessment should be developed in accordance with the EPA Guidelines for the Preparation of Cultural Heritage Reports in Queensland and the Main Roads Cultural Heritage Manual.

A cultural heritage study will be required which will describe indigenous and non-indigenous cultural heritage sites and places, and their values. The study must be conducted by an appropriately qualified cultural heritage practitioner and must include the following:

- liaison with relevant indigenous community/communities concerning:
 - places of significance to that community (including archaeological sites, natural sites, story sites etc); and
 - appropriate community involvement in field surveys.
- any requirements by communities and /or informants relating to confidentiality of site data must be highlighted. Non-indigenous communities may also have relevant information;
- a survey of the proposed development area to locate and record indigenous and non-indigenous cultural heritage places;
- assessment of any cultural heritage sites/places located, if required and only following approval to proceed from Main Roads and a permit to conduct the research and survey under the provisions of the *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987*; and

- a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and recommendations.

As a minimum, investigations and consultation should be undertaken in such a manner and detail to satisfy statutory responsibilities and duties of care, including those under the *Queensland Heritage Act 1992*, the *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987* and the *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, and to protect areas and objects of cultural heritage significance.

4.12.2 Potential Impacts and Mitigation Measures

This section is to provide discussion of any likely impacts on sites of European or Indigenous cultural heritage value. The identification of indigenous cultural heritage impacts is to take place in consultation with relevant indigenous groups. Recommended means of mitigating any negative impacts on cultural heritage values and enhancing any positive impacts is also required.

The management of cultural heritage impacts should be detailed in a Cultural Heritage Management Plan (CHMP) that is developed specifically for the project. The CHMP should provide a process for the management of identified cultural heritage places and values within the project area. The CHMP should be developed in accordance with the Main Roads Cultural Heritage Manual and should include, but not be limited to, the following:

- a process for including the relevant Indigenous community/communities in protection and management of Indigenous cultural heritage;
- processes for mitigation, management and protection of identified cultural heritage places and material along the motorway alignment during the construction of the Project;
- provisions for the management of the accidental discovery of cultural material; and
- a conflict resolution process.

The development of the CHMP should be negotiated with all relevant stakeholder representatives, subject to any confidentiality specified by Indigenous community / 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 *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987* and the *Commonwealth Aboriginal and Torres Strait Islander Heritage Protection Act 1984*, and to protect areas and objects of cultural heritage significance.

4.13 Social Environment

4.13.1 Description of Existing Environment

This section is to describe the existing social values that may be affected by the project. The amenity and use of the project area and adjacent areas for agricultural, fishing, recreational, industrial, educational or residential purposes should be described. Consideration should be given to:

- the integrity of social conditions, including amenity and liveability; harmony and well being; sense of community; and access to social, recreation and community services and infrastructure (this should include discussions of pedestrian and cyclists access);
- population and demographics of the affected community;

- local community values, vitality and lifestyles;
- recreational, cultural, leisure and sporting facilities and activities in relation to the affected area;
- health and educational facilities;
- number of properties directly affected by the project;
- number of families directly affected by the project; and
- the health and safety of the community, workforce, suppliers and other stakeholders should be detailed in terms of health, safety, quality of life from factors such as air emissions, odour, dust and noise.

4.13.2 Potential Impacts and Mitigation Measures

This section is to define and describe the objectives and practical measures for protecting or enhancing social values, to describe how nominated quantitative standards and indicators may be achieved for social impacts management, 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 social 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 project. Consideration should also be given to the impacts of any changes to existing tolling arrangements.

The social impact assessment of the project is to be carried out by a qualified social planning practitioner in consultation with the Social Planner, Brisbane City Region, Department of Communities. The assessment of social impacts should address the following requirements:

- 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 local and state labour markets, with regard to the source of the workforce.
- the effects of the Project on local and regional residents, including land acquisition and relocation issues and property valuation and marketability, community services and recreational activities should be described for the construction and operation phases of the development;
- the social impacts of the proposed project on Aboriginal people within the study area, based on a program of consultation with the local Aboriginal communities.
- the potential environmental harm on the amenity of adjacent areas used for recreation, industry, education, aesthetics, scientific or residential purposes should be discussed. The implications of the Project for future developments in the local area including constraints on surrounding land uses, such as future airport development, should be described; and
- the effects on project workforce of occupational health and safety risks and impacts on the community in terms of health, safety, and quality of life from the construction and operation phases of the Project.

For identified impacts to social values, suggest mitigation and enhancement strategies and facilitate initial negotiations towards acceptance of these strategies. Practical monitoring regimes should also be recommended.

4.14 Economic Environment

4.14.1 Description of Existing Environment

This section is to describe the existing economic environment that may be affected by the project. Consideration should be given to:

- the existing toll arrangements;
- current property values;
- number of properties directly affected by the project;
- the local and regional economy and the significance of the project in this context; and
- regional workforce characteristics and employment levels and the employment opportunities during the construction and operational phases of the project.

4.14.2 Potential Impacts and Mitigation Measures

This section is to define and describe the objectives and practical measures for protecting or enhancing economic values, to describe how nominated quantitative standards and indicators may be achieved for economic impact management, and how the achievement of the objectives will be monitored, audited and managed.

The assessment of economic impacts, including any changes to existing tolling arrangements, should address the following requirements:

- 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 local and state labour markets, with regard to the source of the workforce. This information is to be presented according to occupational groupings of the workforce. The impact of both construction and operational workforces and associated contractors, on housing demand, community services and community cohesion is to be addressed. The capability of the existing housing stock, including rental accommodation, to meet any additional demands created by the project is to be discussed; and
 - comment should be made on how much service revenue and work from the project (e.g. provisioning, catering and site maintenance) would be likely to flow to existing communities / businesses in the area of the project;
- the effects of the Project on local and regional residents, including land acquisition and relocation issues and property valuation and marketability should be described for the construction and operation phases of the development; and
- the economic impacts of the proposed project on Aboriginal people within the study area, based on a program of consultation with the local Aboriginal communities.

4.15 Transportation

4.15.1 Description of Existing Environment

Existing Transport Network

The existing transport operations within the corridor should be described, in terms of:

- the road network, broadly for the regional network and in more detail for the local road system;
- road traffic movements patterns;
- traffic flows – peak, daily, composition;
- interaction of public transport services – existing services details and facilities; and
- rail network and function.

Road Network Performance

The performance of the existing Motorway corridor should be described in terms of:

- through traffic demand;
- travel speeds and travel times;
- intersection operation including operating level service (delays and queuing);
- interaction with public transport, walking and cycling; and
- accident history and road safety.

Traffic Forecasting Methodology

A description of the modelling studies undertaken for the project should be provided, with particular emphasis on:

- land use patterns – a description of the population and demographic forecasts used;
- the scope and validity of the transport models used (overview only);
- the provision of year forecasts - 2006, 2011, 2016, 2021;
- network improvements in modelling – which upgrades have been included in the modelling (eg North South Bypass Tunnel) and changes to land use resulting from urban renewal opportunities; and
- An explanation of how alternative future scenarios were modelled.

An explanation should also be provided on how to assess and deal with induced and suppressed traffic.

Future Base Traffic Conditions

Future conditions on the Motorway corridor should be outlined for at least two model years (2011, 2021), without the Gateway Upgrade Project in place, in terms of:

- traffic patterns – volumes, speeds;
- network performance – intersection operation (eg degree of saturation, delays and queues); and
- road safety assessment.

4.15.2 Potential Impacts and Mitigation Measures

The potential impacts of the proposed works, including any changes to existing tolling arrangements, should be demonstrated for future model years, as follows:

- traffic volumes –with and without the new bridge and Motorway upgrade;
- traffic on the local road network;

- regional route traffic implications;
- effects of the Motorway upgrade in the immediate area and extending along the main feeder routes;
- intersection performance;
- car movements (eg travel times, vehicle kilometres travelled, trip diversions);
- commercial vehicle movements (eg travel times, vehicle kilometres travelled and trip diversions);
- aggregate road network performance – VKT, VHT, average vehicle speeds;
- impacts on access to properties and existing roads;
- impacts on rail network; and
- road Safety Accidents.

Options available to monitor and mitigate potential transportation effects should be discussed.

4.16 Pedestrian and Cycle Issues

4.16.1 Description of Existing Environment

Describe the existing and planned infrastructure for pedestrian and cycle movements and facilities within the environs of the Project.

4.16.2 Potential Impacts and Mitigation Measures

This section should discuss the potential impacts of the Project on existing and planned infrastructure for pedestrian and cycle movements and facilities affected by the proposal. Options for pedestrian and cycle use of the river crossing, along and across the corridor should be investigated and reported.

4.17 Utility Services

4.17.1 Description of Existing Environment

Describe the existing utility services that may be affected by the project, including electricity, sewerage, water, telecommunications, and airport infrastructure. Owners of the utilities should be provided.

4.17.2 Potential Impacts and Mitigation Measures

This section is to assess the potential impacts of the project on existing utility services. Strategies to minimise potential impacts on existing utility services should be provided.

4.18 Hazard and Risk

4.18.1 Description of Existing Environment

This section is to describe the potential hazards and risk that may be associated with the project. The transportation of dangerous goods and the storage of fuels are issues to be considered in the EIS. Due regard to the safe movement of 'dangerous goods' in accordance with the Transport Operations (Road Use management) Act 1995, the Transport

Operations (Road Use management- Dangerous Goods) Regulations 1998 and the Dangerous Goods Safety Management Act 2000 is required.

The environmental values likely to be affected by any hazardous materials and actions incorporated in the project are to be detailed, as should the degree and sensitivity of each risk. Reference should be made to the Department of Emergency Services Disaster Management Book.

4.18.2 Potential Impacts and Mitigation Measures

This section is to outline strategies for hazard and risk management including access and egress for emergency vehicles, the adequate provision of hydrant water systems and the specific details of the traffic management system. Further details on these matters can be obtained from the Manager, Regional Planning, Brisbane Region, Queensland Fire and Rescue Services.

4.19 Visual Amenity

4.19.1 Description of Existing Environment

This section is to describe and map the landscape amenity of the project area and adjacent areas giving consideration to:

- existing landscape features which should include a list of both natural and man-made features that contribute to the local landscape setting; and
- local amenity and use of the project area and adjacent areas in terms of features that currently or have potential to contribute to local community values, vitality and lifestyle. Local amenity should be described under appropriate use categories such as open space, residential, and industrial.

4.19.2 Potential Impacts and Mitigation Measures

The potential impacts on local amenity for road users and adjacent areas are to be described under categories such as open space/recreation, industry and residential. The potential visual impacts should be undertaken in accordance with the Department of Main Roads "Road Landscape Manual" (September 1997) and should include:

- description and evaluation of existing visual environment to identify visual sensitivity that measures how critically the road development will be viewed. This information is to be summarised on a "Visual Sensitivity Matrix" that identifies High, Moderate or Low visual sensitivity of various landscape features;
- identification of the visual catchment by undertaking a "View Shed Analysis" to map visual exposure;
- change to visual character by describing the level of effect on existing visual character according to the degree of contrast created by the road proposal;
- affect on visual amenity for local community and visitors. Visual amenity effects are to be described as Low, Medium or High; and
- visual experience for road users by describing the perceived 'drive through' experience for the motorist.

Mitigation measures to minimise visual impacts are to be identified on plan and described. Mitigation measures are to include landscape and urban design treatments.

5 ENVIRONMENTAL MANAGEMENT PLAN

A Draft Environmental Management Plan (EMP) (Planning) should be provided outlining the strategies to be adopted to address identified impacts (as per Section 4 of these TOR). The EMP should conform to an Environmental Management Plan (Planning) as per the Main Roads Road Project Environmental Management Processes Manual.

The purpose of the EMP is to set out the proponents' commitments to environmental management. That is, how environmental values will be protected and enhanced. The EMP is an integral part of the EIS, but should be capable of being read as a stand-alone document without reference to other parts of the EIS (therefore some sections may be duplicated). The EMP should include the following:

- an introduction to the project that includes a detailed project description;
- the project's legislative requirements;
- the mitigation measures for inclusion in the detailed design of the project and for the development of the construction contract documentation, generally provided in tabular format;
- the mitigation strategies for the construction phase, generally provided in tabular format;
- the mitigation strategies for the operational / maintenance phase, generally provided in tabular format;
- any mitigation measures should include performance indicators and outcomes. These are to be measurable criteria against which the implementation of the actions and the level of achievement of the performance objectives will be measured;
- monitoring, auditing and reporting strategies for the construction and operational aspects of the project;
- responsibilities assigned to a relevant person/organisation; and
- the procedure and reporting framework for the identification of non-conformances and the implementation of the subsequent corrective action is to be outlined.

6 CONCLUSION AND RECOMMENDATIONS

A balanced overview of the project's impact should be provided together with recommendations based on the studies presented, the environmental management plan and conformity of the project with Environmentally Sustainable Development policy.

7 REFERENCES

References should be presented in a consistent and recognised format.

8 RECOMMENDED APPENDICES

8.1 Final Terms of Reference for this EIS

A copy of the final Terms of Reference should be included in the EIS. Where it is intended to bind appendices in a separate volume from the main body of the EIS, the Terms of Reference at least should be bound with the main body of the EIS for ease of cross-referencing.

8.2 Consultation Report

The Consultation Report should summarise the results of the community consultation program, focussing on 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.

A list of all parties consulted should be included, in addition to a description of how 'interested' and/or 'affected persons' (EP Act) and 'affected parties' (EPBC Act) were identified.

8.3 Study Team

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

8.4 Specialist Studies

All reports generated on specialist studies undertaken as part of the EIS are to be included as appendices.

9 TOR REFERENCES

The following are selected references cited in the terms of reference plus additional references that may be of use in developing the environmental impact statement (it is noted that this is not a comprehensive list and additional publications should be considered).

Environmental Impact Assessment

ANZECC (1991) '*A National Approach to Environmental Impact Assessment in Australia*', Australian and New Zealand Environment and Conservation Council, September 1991; and Background Paper, October 1991.

ANZECC (1996) '*Guidelines and Criteria for Determining the Need for and Level of Environmental Impact Assessment in Australia*', Australian and New Zealand Environment and Conservation Council, September 1993 and updated 1996

ANZECC (1997) '*Basis for a National Agreement on Environmental Impact Assessment*', Australian and New Zealand Environment and Conservation Council, September 1993 and updated 1997

Council of Australian Governments, Commonwealth of Australia (1992) '*National Strategy for Ecologically Sustainable Development*' December 1992, AGPS, Canberra,

Council of Australian Governments, Commonwealth of Australia (1992) '*InterGovernmental Agreement on the Environment*' Signed 28 February 1992, AGPS, Canberra.

Environment Protection Agency (1995) "*Best Practice Environmental Management in Mining*" series including "*Environmental Impact Assessment*" Commonwealth of Australia - <http://www.environment.gov.au>

Environment Australia (1999) legislation *Environment Protection and Biodiversity Conservation Act* 1999 - Commonwealth of Australia - <http://www.environment.gov.au>

GHD (2003) Gateway Motorway and Second River Crossing Planning Study - A seven volume study prepared on behalf of Main Roads:

Volume 1 - Strategic Corridor Planning Report - Mt Gravatt Capalaba Rd to Nudgee Rd

Volume 2 - Draft Route Location and Corridor Assessment Report - Lytton Rd to Nudgee Rd

Volume 3 - Draft Review of Environmental Factors (Concept) - Lytton Rd to Nudgee Rd

Volume 4 - Draft Concept Planning Report - Lytton Rd to Nudgee Rd

Volume 5 - Draft Review of Environmental Factors (Concept) - Mt Gravatt Capalaba Rd to Lytton Rd

Volume 6 - Draft Concept Planning Report - Mt Gravatt Capalaba Rd to Lytton Rd

Volume 7 - Community Consultation Report - Mt Gravatt Capalaba Rd to Nudgee Rd

Queensland Environmental Protection Agency (1994) legislation *Environmental Protection Act 1994* and *Environmental Protection and Other Legislation Amendment Act 2000* - <http://www.env.qld.gov.au> - <http://www.legislation.qld.gov.au>

Queensland Environmental Protection Agency (2001) EIA policies and guidelines
<http://www.env.qld.gov.au>

Brisbane Airport Corporation Limited 2003 draft Master Plan and 2004 draft Airport Environment Strategy

Social Impact Assessment

“Social Issues in Development Assessment – A Resource Guide” 2002. This publication covers the range of considerations in conducting social impact assessment as well as a full range of references on the topic.

“Social Impact Assessment in Queensland” 2000

These publications are available on the Department of Communities website at: <http://www.communities.qld.gov.au>

Land Management

Gunn RH, Beattie JA, Reid RE, van de Graff R, eds (1988) *Australian Soil and Land Survey Handbook: Guidelines for Conducting Surveys*, Inkata Press, Melbourne

McDonald RC, Isbell RF, Speight JG, Walker J, Hopkins MS (1990) *Australian Soil and Land Survey Field Book*, Inkata Press, Melbourne

Rosser J, Swartz GL, Dawson NM, Briggs HS (1974) *A Land Capability Classification for Agricultural Purposes Division Land Util.* Tech. Report 14 QDPI

Queensland Department of Environment (1998) *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* - Department of Environment, Brisbane

Acid Sulphate Soils

State Planning Policy 2/02 - Planning and Managing Development involving Acid Sulphate Soils

EPA's 2001 Instructions for the Treatment and Management of Acid Sulphate Soils

DNRM&E's 2002 Queensland Acid Sulphate Soils Technical Manual - Soil Management Guidelines

Guidelines for Sampling and Analysis of Lowland Acid Sulphate Soils, Ahern et al 1998

Water

ANZECC (1992) *National Water Quality Management Strategy: Australian Water Quality Guidelines for Fresh and Marine Waters* - Agriculture and Resource Management Council of Australia, and Australian and New Zealand Environment and Conservation Council, Canberra. See ANZECC 1998 and 1999 for latest versions.

ANZECC (1994) *National Water Quality Management Strategy: Policies and Principles, a Reference Document* - Agriculture and Resource Management Council of Australia, and Australian and New Zealand Environment and Conservation Council, Canberra.

ANZECC (1996) *National Water Quality Management Strategy: Draft Guidelines for Urban Stormwater Management* - Agriculture and Resource Management Council of Australia, and Australian and New Zealand Environment and Conservation Council, Canberra.

ANZECC (1996) *National Water Quality Management Strategy: National Principles for the Provision of Water for Ecosystems* - Agriculture and Resource Management Council of Australia, and Australian and New Zealand Environment and Conservation Council, Canberra.

ANZECC (1998) *National Water Quality Management Strategy: Implementation Guidelines* - Agriculture and Resource Management Council of Australia, and Australian and New Zealand Environment and Conservation Council, Canberra.

ANZECC (2000) *National Water Quality Management Strategy: Australian and New Zealand Water Quality Guidelines for Fresh and Marine Waters* - Agriculture and Resource Management Council of Australia, and Australian and New Zealand Environment and Conservation Council, Canberra.

Queensland Department of Environment and Heritage (1999) *Water Quality Sampling Manual: for use in testing for compliance with the Environmental Protection Act 1994*; third edition; DEH

Queensland Department of Environment and Heritage (1998) *Queensland Water Quality Guidelines: Version 1*. Queensland Department of Environment and Heritage

Queensland Department of Environment and Heritage (1998) *Stormwater Quality Control Guidelines for Local Government*, Queensland Departments of Natural Resources and Environment and Heritage.

Queensland Department of Environment and Heritage (September 1998) *Guidebook for Local Government and Department of Environment and Heritage Authorised Officers: Delegations and Authorisations under the Environmental Protection (Water) Policy 1997*; published internally by DEH; not publicly available.

Queensland Environmental Protection Agency (1999) *Strategy for the Conservation and Management of Queensland Wetlands* - Queensland Environmental Protection Agency

Technical Guides

ANZECC (1999) *National Water Quality Management Strategy: Guidelines for Sewerage Systems - Treatment and Management of Sewerage*. Agriculture and Resource Management Council of Australia and Australian and New Zealand Environment and Conservation Council, Canberra

Cooperative Research Centre for Catchment Hydrology (1997) *Best Practice Environmental Management Guidelines for Urban Stormwater - Background Paper* Prepared for Environment Protection Authority, Victoria, Melbourne Water Corporation and Department of Natural Resources and Environment

Institution of Engineers Australia (Pilgrim and Canterford) (1987) *Australian Rainfall and Runoff; a guide for flood estimation*; IE Aust., Canberra

Queensland Department of Environment and Heritage (1999) *Queensland State of Environment Report* Queensland Environment Protection Agency

Queensland Department of Main Roads – Fitness for Purpose and the Extended Design Domain

Queensland Department of Main Roads – Road Planning and Design Manual.

Witheridge, G. & Walker, R. (1996) *Soil Erosion and Sediment Control - Engineering Guidelines for Queensland Construction Sites* - Institution of Engineers, Australia, Queensland Division, Brisbane

Water Resources Commission (1992) *Guideline for the Design of Sewerage Systems* Volumes 1 & 2. Department of Primary Industries

Coast

Beumer, J., Carseldine, L., Zeller, B. 1997, *Declared Fish Habitat Areas in Queensland*, Fisheries Group, Department of Primary Industries (Queensland), Declared Fish Habitat Area Atlas QDPI, supplement to FHMOP 002.

Brown, V. 1995. *Turning the tide: Integrated local area management for Australia's coastal zone*, summary of a report produced for the Department of Environment, Sports and Territories, at http://www.environment.gov.au/library/pubs/Turning_Tide/tide1.html.

Catterall, C.P., 1993, 'The importance of riparian zones to terrestrial wildlife', in S.E. Bunn, B.J. Pusey and P. Price (eds) *Ecology and management of riparian zones in Australia*, Land and Water Resources Research and Development Corporation Occasional Paper Series No. 05/93, Canberra, Australia, pp. 41–52.

Coastcare *Annual Report* 1995/96.

Conachen, P.A., Joy, D.W.B., Stanley, R.I. and Treffany, P.T. (eds) 1990, *Dune management — a manual of coastal dune management and rehabilitation techniques*, Soil Conservation Services, Sydney, for Conservation Commission of the Northern Territory.

Graham, B. and Pitts, D. 1998, *Good Practice Guidelines for Integrated Coastal Planning*, Royal Australian Planning Institute and Commonwealth Department of the Environment, Coast and Clean Seas, Report Series 13, AGPS, Canberra.

Hopkins, E., White, M. and Clarke, A. 1998, *Restoration of Fish Habitats — Fisheries Guidelines for Marine Areas*, Fish habitat guideline 002, Department of Primary Industries, Queensland

IMCRA Technical Group 1998, *Interim Marine and Coastal Regionalisation for Australia: An ecosystem-based classification for marine and coastal environments*, Version 3.3, Environment Australia for Australian and New Zealand Environment and Conservation Council.

Low Choy, D. and Dart, R. 1997, Queensland Department of Environment Coastal Management Annotated Bibliography.

National Committee on Coastal and Ocean Engineering 1991, *Guidelines for Responding to the Effects of Climatic Change in Coastal Engineering Design*, Institution of Engineers, Australia

National Committee on Coastal and Ocean Engineering 1998, *Coastal Engineering Guidelines for Working with the Australian Coast in an Ecologically Sustainable Way*, Commonwealth Department of Environment and the Institution of Engineers, Coast and Clean Seas, Report Series 14, AGPS, Canberra.

Natural Heritage Trust 1997, *Coasts and Clean Seas*

Natural Heritage Trust 1997, *Guide to the Coastal and Marine Planning Program 1997–98*.

Queensland Environmental Protection Agency (2000) *Draft State Coastal Management Plan* Qld EPA Qld Government. Public consultation draft on <http://www.env.qld.gov.au/environment/coast/management>

Air

NEPC (1998) *National Environmental Protection Measure for Ambient Air Quality*. National Environmental Protection Council, Adelaide.

NEPC (1988) *National Environmental Protection Measure: National Pollutant Inventory*. National Environmental Protection Council, Adelaide. (Note: the first set of data on air quality has yet to be published under this NEPM).

NHMRC (1996) *Ambient Air Quality Goals Recommended by the NHMRC* - National Health and Medical Research Council, Canberra

Department of Environment and Heritage (1998) *User's Guide to Queensland's Environmental Protection (Air) Policy 1997* - DEH, October 1998.

Queensland Environmental Protection Agency (1999) "Queensland's Implementation Plan 1999" *National Greenhouse Strategy*

World Health Organisation (1999) *Guidelines for Air Quality* Geneva WHO

World Bank (1998) *Pollution Prevention and Abatement Handbook* Washington World Bank

Australian Environment Council & National Health and Medical Research Council (1985) *National Guidelines for Emission of Air Pollutants from New Stationary Sources* Canberra AEC and NHMRC

Environment Australia National Greenhouse Gas Inventory Committee (1995) National Greenhouse Gas Inventory 1995

Environment Australia (1992) - National Greenhouse Response Strategy 1992

Waste

Queensland Department of Environment (1996) *Waste Management Strategy for Queensland* - Queensland Department of Environment, Brisbane

Queensland Department of Environment (1998) *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* - Department of Environment, Brisbane

ANZECC (1998) *Towards Sustainability: Achieving Cleaner Production in Australia*. Australian and New Zealand Environment and Conservation Council, Canberra.

ANZECC (1994) *National Strategy for the Management of Scheduled Wastes* - Australian and New Zealand Environment and Conservation Council, Canberra

NEPC (1999) *National Environmental Protection Measure on Assessment of Site Contamination*, NEPC Service Corporation, Adelaide.

Queensland Environmental Protection Agency (in press) *Central and Northern Queensland Land Characterisation Study* - Environmental Protection Agency, Brisbane

The following are selected references for use in planning for proposals:

AS/NZS/ISO 14040 (1998) - *Life Cycle Assessment - Principles and Framework*

AS/NZS/ISO 14041 (1999) - *Life Cycle Assessment - Goal, Scope and Definition*

AS/NZS/ISO 14049 - *Life Cycle Assessment - Technical Report (Illustrative Example)*

Noise

All Australian Standards and other documents outlined in Schedules 3 and 4 of the Environmental Protection (Noise) Policy are endorsed by the Environmental Protection Agency for use in planning and impact assessment.

Australian Standard AS1055.2-1997 Acoustics - Description and measurement of environmental noise - Application to specific situations

Australian Standard AS1055.5-1997 Acoustics - Description and measurement of environmental noise - Acquisition of data pertinent to land use

Australian Standard AS2670.2-1990 Evaluation of Human Exposure to Whole Body Vibration Part 2: Continuous and shock induced vibration in buildings (1 to 80 Hz).

British Standard BS6472:1992 Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz).

Nature Conservation

Queensland Environmental Protection Agency (1999) *Strategy for the Conservation and Management of Queensland Wetlands* - Queensland Environmental Protection Agency, Brisbane

Queensland Environmental Protection Agency (2000) *Characteristics of Important Wetlands in Queensland* - Queensland Environmental Protection Agency, Brisbane

Queensland Environmental Protection Agency (1999) *State of the Environment Queensland 1999* - Queensland Environmental Protection Agency, Brisbane

Sattler, P. & Williams, R. (1999) *The Conservation Status of Queensland's Bioregional Ecosystems* - Queensland Environmental Protection Agency, Brisbane

Commonwealth of Australia (1992) *Intergovernmental Agreement on the Environment* - Commonwealth Government, Canberra

Commonwealth of Australia (1992) *National Strategy for Ecologically Sustainable Development* - Commonwealth Government, Canberra

Commonwealth of Australia (1996) *National Strategy for the Conservation of Australia's Biological Diversity* - Commonwealth Government, Canberra

Commonwealth of Australia (1992) *Australian National Strategy for the Conservation of Australian Species and Communities Threatened with Extinction*. Commonwealth Government, Canberra.

Cultural Heritage

The Australian ICOMOS Charter of the Conservation of Places of Cultural Significance (the Burra Charter) - a set of conservation principles and processes determined by heritage professionals which are used nationally for guidance in the practice of conservation and management of heritage places.

Queensland Environmental Protection Agency (1999) Selected references and provisions for use in environmental impact assessment are contained in *Guidelines for Historical and Indigenous Cultural Heritage Management* EPA Brisbane.

Health and Safety

Various Australian Standards, SAA Standards Australia, Canberra ACT.
<http://www.standards.com.au>

Guidelines to minimise mosquito and biting midge problems in new development areas, Queensland Health, March 2002

Health Impact Assessment Guidelines, Commonwealth Department of Health and Aged Care, September 2001

Health Impact Assessment Framework, Queensland Health, February 2004

Economic

Commonwealth Department of Finance (1991) *Handbook of Cost/Benefit Analysis*, AGPS

National Competition Council (1997) *Compendium of National Competition Policy Agreements*, Canberra

Queensland Treasury (1997) *Project Evaluation Guidelines*, Queensland Government, Brisbane

Queensland Treasury (1999) *Community Service Obligations: A Policy Framework*, Queensland Government, Brisbane

Hazard and Risk

NSW Department of Urban Affairs and Planning (1992) *HAZOP Guidelines* (DUAP)

NSW DUAP (1994) Hazardous Industry Planning Advisory Paper (HIPAP)

AS/NZA (1999) *Risk Management Standard 4360*

Australian Dangerous Goods Codes

State Planning Policy (SPP) 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide.

DES Disaster Risk Management Book