# Gold Coast Marine Development

# Draft
# Terms of Reference
# for an
# Environmental Impact Statement

**The Coordinator-General**
October 2005

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# PREFACE

The project was declared to be a "significant project" under Section 26 of the Queensland *State Development and Public Works Organisation Act 1971* (*SDPWOA*) by the Coordinator-General (CG) on 17 October 2005. Matters considered by the CG in making this declaration included information in an Initial Advice Statement prepared by the proponent, the level of investment necessary for the project, employment opportunities provided by the project, potential impact on the environment, potential effects on relevant infrastructure and the significance of the project to the region and State. The declaration initiates the statutory environmental impact assessment procedure of Part 4 of this Act, which requires the proponent to prepare an Environmental Impact Statement (EIS) for the project.

The CG is responsible for managing the environmental impact assessment process. The CG has invited relevant State and Local Government representatives and authorities to participate in the process as Advisory Agencies.

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

The draft ToR have been developed with consideration of preliminary issues raised bv a range of stakeholders and interested parties, including, but not limited to:

State government agencies
Gold-Cost based business groups
the Gold Coast City Council
the Gold Coast and Hinterland Environment Council
Friends of Federation Walk
Main Beach Progress Association
the local dive industry
recreational users of local open space, waterways and beaches, and
other individuals and organisations associated with the Save Our Spit Alliance.

These parties will able to provide more detailed comments on the draft ToR.

The statutory impact assessment process under the *SDPWOA* is also the subject of a bilateral agreement between the Queensland and the Commonwealth Governments in relation to environmental assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act).* The proponent will refer the proposal to the Commonwealth Minister for the Environment and Heritage in accordance with the provisions of the *EPBC Act* indicating that it is believed to be a controlled action with the controlling provisions being wetlands of international importance (section 16), listed threatened species and communities (section 18), listed migratory species (section 20) and marine environment (section 23). A decision on whether the project will be declared to be a controlled action is expected in November 2005.

If the project is declared as a controlled action, the Commonwealth Minister would undertake a separate approval process following release of the CG's report. The Minister would then grant, or withhold, approval for the controlled action under section 133 of the EPBC Act. The Minister may attach conditions to the approval, in addition to those set by the Coordinator-General, to mitigate impacts on matters of National Environmental Significance (NES).

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

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

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

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

Alternatively the CG report must state for the assessment manager –

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

Further, the CG report must:

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

Further to the above *IPA* approvals, other approvals under a range of legislation including, but not limited to, the *Coastal Protection and Management Act 1995, Integrated Planning Act 1997, Environmental Protection Act 1994, Fisheries Act 1994,* are likely to be required.

These ToR provides information in two broad categories:

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

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[*] ***The term <u>environment</u> refers to:***

***a) ecosystems and their constituent parts, including people and communities;***

***b) all natural and physical resources;***

***c) the qualities and characteristics of locations, places and areas, regardless of size, that stimulate biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community;***

***d) the social, economic, aesthetic and cultural conditions which influence, or are affected by, the entities and attributes mentioned in paragraphs (a) to (c); and***

**e)** ***the local, regional, Queensland and Australian populations and labour markets.***

# PART A - INFORMATION AND ADVICE ON THE PREPARATION OF THE EIS

## Project Proponent

The State of Queensland is the project proponent. It is anticipated that a statutory board will be established pursuant to the *State Development and Public Works Organisation Act 1971* to progress the project.

## Project Description

The project under consideration consists of the following components:

- A cruise ship terminal on the northern end of The Spit; and
- A marina for super yachts and other vessels in the Marine Stadium or to the west of Seaworld.

## Purpose of the Terms of Reference

These ToR essentially outline the issues that should be considered in preparing the EIS. Furthermore, the ToR provides the framework for the EIS, including information on the purpose and role of the EIS and the factors considered to be most significant for the proposal. It indicates the types of studies and the data that should be provided in the EIS. All potentially significant impacts of the proposed development on the environment are to be investigated, and requirements for the mitigation of any adverse impacts are to be detailed in the EIS. Any prudent and feasible alternatives should be discussed and treated in sufficient detail. The 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 gravity of impacts. These guidelines should, however, not be interpreted as excluding from consideration any matters which are currently unforeseen, which may arise during ongoing scientific studies or which may arise from any changes in the nature of the proposal during the preparation of the EIS, the community consultation process and associated documentation.

The EIS should address at least the requirements as set out in these ToR.

## EIS Guidelines

The objective of the EIS is to identify potential environmental impacts and to ensure that those impacts are avoided where possible. Where unavoidable, impacts must be examined fully and addressed so that the development is based on sound environmental protection and management criteria.

The EIS process followed will be as specified in the *State Development and Public Works Organisation Act 1971* and (if necessary) meet Commonwealth regulations as specified in the *Environment Protection and Biodiversity Conservation Act 1999.*

An EIS should provide:

- a description of the relevant aspects of the existing social, economic, natural and built environment;
- a description of the development proposal and means of achieving the development objectives;
- definition and analysis of the likely impacts of the development on the environment;
- a framework against which Government decision-makers can consider the environmental aspects of the proposal and set conditions for approval to ensure environmentally sound development;
- a definition of all significant impacts and a consolidated list of measures proposed to mitigate adverse effects; and
- recommendations on the need for and contents of any environmental management plans and/or operational plans to mitigate adverse effects.

## EIS Objectives and Key Issues

### *Objectives*

The objectives of the EIS are as follows:

- to provide information on the proposal and development process to the community and decision makers;
- to comprehensively identify and evaluate all relevant issues associated with the proposal;
- to identify all potential environmental, cultural, social, transport and land use planning impacts of the preferred concept, and recommend infrastructure and facilities needs together with other design and operational measures required to minimise or compensate for adverse impacts and enhanced benefits;
- to consult with the community and relevant stakeholders in the process of identifying, assessing and responding to the impacts of the proposal;
- to identify all necessary licences, planning and environmental approvals including approval requirements pursuant to the *Environment Protection and Biodiversity Conservation Act 1999, Coastal Protection and Management Act 1995, Integrated Planning Act 1997, Environmental Protection Act 1994, Fisheries Act 1994, Nature Conservation Act 1992, Vegetation Management Act 1999* and other legislation and the Gold Coast City Planning Scheme; and
- to provide an input to the decision-making process, assisting with the determination of whether to accept or modify the proposal, approve it with conditions or carry out further studies.

### *Key Issues*

The issues to be addressed as part of the EIS can be divided into the following categories:

- detailed project description;
- project justification and alternatives;
- impacts on the terrestrial environment, including impacts on visual and aesthetic amenity;
- impacts on the road network in the area and parking;
- impacts on the coastal environment, including impacts on marine life and wave quality on adjacent beaches, including the south end of South Stradbroke Island.
- impacts on water quality;
- impacts on areas of cultural heritage value or indigenous significance;
- air emissions and impacts;
- impacts of noise and vibration;
- impacts on surrounding land uses and land use planning, including impacts on existing public open space, such as Doug Jennings Park, the land surrounding the marine stadium and the nature reserve area to the east of Seaworld Drive;
- economic issues, including impacts on local and regional businesses, with specific reference to the dive industry, the recreational and commercial fishing industries and tourist cruise operators;
- social issues, including impacts on recreational use of The Spit and Broadwater, such as fishing, diving and boating;
- safety and emergency, including implications for access to the Broadwater and Seaway, with specific reference to recreational users of the Seaway.
- waste management.

The EIS will be required to consider in detail relevant issues under each of these categories and all other impacts on the physical and social environment. The information required is described in the following sections.

## Public Consultation on Terms of Reference

The draft ToR will be publicly notified in *The Courier-Mail* and *The Gold Coast Bulletin* and *The Australian* newspapers and the CG website inviting comment on the draft ToR for the project.

Any comments and submissions will need to be provided within a submission period of 20 business days from the initial advertising date. The closing date for submissions therefore, is Monday 28 November 2005.

# PART B - CONTENT OF THE EIS

**It is strongly recommended that the environmental impact statement (EIS) follow the heading structure of these terms of reference to facilitate cross-referencing. This structure has been found through long experience to be the best option.**

## Executive Summary

The function of the executive summary is to convey the most important aspects and options relating to the project to the reader in a concise and readable form. It should use plain English and avoid the use of jargon and esoteric terms. The structure of the executive summary should follow that of the EIS, and focus strongly on the key issues and conclusions.

## Glossary of Terms

A glossary of technical terms, acronyms and abbreviations should be provided.

# 1 Introduction

The function of the introduction is to explain why the EIS has been prepared and what it sets out to achieve. In particular, the introduction should address the level of detail of information required to meet the level of approval being sought (for example, whether the proponent is seeking only a preliminary approval through the Integrated Development Assessment System (IDAS) or a full approval with all permits). It should also define the audience to whom it is directed, and contain an overview of the structure of the document. Throughout the EIS, factual information contained in the document should be referenced.

## 1.1 Project proponent

Provide details of the project proponent.

## 1.2 Project description

A brief description of the key elements of the project should be provided and illustrated. Any major associated infrastructure requirements should also be summarised. Detailed descriptions of the project should follow in Section 3.

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

## 1.3 Project objectives and scope

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

Describe the current status of the project and outline the relationship of the project to other developments or actions that may relate whether or not they have been approved. The consequences of not proceeding with the project should also be discussed.

## 1.4 The environmental impact statement (EIS) process

The purpose of this section is to make clear the methodology and objectives of the environmental impact statement under the relevant legislation.

### 1.4.1 Methodology of the EIS

This section should provide a description of the EIS process steps, timing and decisions to be made for relevant stages of the project. This section should also indicate how the consultation process (which will

be described in detail in section 1.5) would integrate with the other components of the impact assessment, including the stages, timing and mechanisms for public input and participation. The information in this section is required to ensure:

- that relevant legislation is addressed;
- readers are informed of the process to be followed; and
- that stakeholders are aware of any opportunities for input and participation.

### 1.4.2 Objectives of the EIS

Having described the methodology of the EIS, a succinct statement should be made of the EIS objectives. The structure of the EIS can then be outlined as an explanation of how the EIS will meet its objectives. The reader should be able to distinguish the EIS as the key environmental document providing advice to decision makers considering approvals for the project.

While the terms of reference provide guidance on the scope of the EIS studies, they should not be seen as exhaustive or limiting. It is important for proponents and their consultants to recognise that there cannot be perfect knowledge in advance of undertaking an EIS of what the EIS studies may find.

**If it transpires during the preparation of the EIS that previously unforeseen matters not addressed in the terms of reference are found to be relevant to the assessment of impacts of the proposal, those matters should be included in the EIS.**

**In addition, it is essential that the main text of the EIS should address all relevant matters concerning environmental values, impacts on those values and proposed mitigation measures. No relevant matter should be raised for the first time in an appendix or the draft EM Plan.**

**When considering whether an impact is or is not significant, the proponent should take account of both the intensity of the impact and the context in which it would occur.**

The EIS is a public document. Its purpose is not only to provide information to regulatory agencies, but also to inform the public of the scope, impacts and mitigation measures of the proposal. As such the main text should be written in plain English avoiding jargon as much as possible. Additional technical detail may be provided in appendices. The main text should not assume that a reader would have a prior knowledge of the project site. It should not be necessary for the reader to have visited the site to understand the issues involved in the proposal.

In brief, the EIS objectives should be to provide public information on the need for and likely effects of the project, to set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values, and demonstrate how environmental impacts can be managed through the protection and enhancement of the environmental values. Discussion of options and alternatives and their likely relative environmental management outcomes is a key aspect of the EIS.

The role of the EIS in providing the project's draft environmental management plan (EM Plan) should also be discussed, with particular reference to the EM Plan's role in providing management measures that can be carried over into conditions that would attach to any approval(s), environmental authorities and permits for the project.

### 1.4.3 Submissions

The reader should be informed as to how and when public submissions on the draft EIS will be addressed and taken into account in the decision-making process.

## 1.5 Public consultation process

To facilitate the assessment process, the proponent is strongly encouraged to regularly consult with Advisory Agencies and other appropriate stakeholders throughout the EIS process. This should include consultation with relevant Indigenous traditional owner groups and the Indigenous community.

It is the responsibility of the proponent, in consultation with Advisory Agencies, to identify legislation, policies and methodologies relevant to the EIS process, and to determine appropriate parts of the community which should be consulted during the EIS preparation stage. It is recommended that an open community consultation process be carried out in addition to the legislated environmental impact

assessment process. Copies of the draft EIS will be provided to all Advisory Agencies and on request to relevant individuals and peak groups with an interest in the project.

The public consultation program should provide opportunities for community involvement and education. It may include interviews with individuals, public meetings, interest group meetings, production of regular summary information and updates, and other consultation mechanisms to encourage and facilitate active public consultation.

The public consultation process should identify broad issues of concern to local community and interest groups and should continue from project planning through to operations.

### 1.5.1 Relevant legislation and policy requirements

This section should explain the legislation and policies controlling the approvals process. Reference should be made to the *State Development and Public Works Organisation 1971*, *Environmental Protection Act 1994, Integrated Planning Act 1997, Coastal Protection and Management Act 1995, Fisheries Act 1994* and other relevant Queensland laws. Any requirements of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and *Environment Protection (Sea Dumping) Act 1981* should also be included.

Local Government planning controls, local laws and policies applying to the development should be described, and a list provided of the approvals required for the project and the expected program for approval of applications.

This information is required to assess how the legislation applies to the proposal, which agencies have jurisdiction, and whether the proposed impact assessment process is appropriate.

### 1.5.2 Planning processes and standards

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

## 1.6 Accredited process for controlled actions under Commonwealth legislation

Projects that are undergoing an EIS under a State statutory process may also be controlled actions under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC). In which case, the Commonwealth may accredit the State's EIS process for the purposes of the Commonwealth's assessment under Part 8 of the EPBC.

When a State EIS process has been accredited, it will be necessary for the terms of reference to address potential impacts on the matters of National Environmental Significance (NES) that were identified in the 'controlling provisions' when the project was declared a controlled action.

As a minimum requirement, the terms of reference and the EIS should provide separate discussions under sub-headings in the relevant sections that describe the values and address the potential impacts on NES matters. The locations of those sub-headings should be readily identifiable from the Table of Contents. For example, if one of the controlling provisions was 'Listed threatened species and communities', then subsections, headed 'Matters of National Environmental Significance', should be placed in Section 4.8 (Nature conservation) under both the Description of environmental values and Potential impacts and mitigation measures headings. Those subsections should address exclusively and fully the issues relevant to the controlling provisions.

Alternatively, a stand-alone report could be provided as an appendix to the EIS that exclusively and fully addresses the issues relevant to the controlling provisions. In which case, it should follow the following template outline:

1. Introduction
2. Description of Proposed Action (as it would impact on NES matters)
3. Description of the Affected Environment Relevant to the Controlling Provisions (i.e. describe the features of the environment that are NES matters protected under the EPBC)

4. Assessment of Impacts on NES Matters and Mitigation Measures
5. Conclusions
6. References

# 2 Project need and alternatives

## 2.1 Project justification

The justification for the project should be described, with particular reference made to the economic and social benefits, including employment and spin-off business development, which the project may provide. The status of the project should be discussed in a regional, State and national context.

A detailed assessment of the need/demand for the proposed cruise ship terminal and marina precinct is required with regard to the following matters:

- the need for the proposal against the tourism industry outlook and any relevant policy and regulatory framework;
- planning grounds justifying the proposal in relation to the Gold Coast City Council planning scheme and the *South East Queensland Regional Plan 2005-2026*;
- need for the proposal in terms of the most recent cruise ship terminal developments undertaken and approved in SEQ;
- need for the proposal against existing and proposed marina facilities in the region;
- potential benefits for the SEQ marine industry;
- the suitability for the location proposed;
- need for commercial and retail facilities as part of the proposal;
- local and regional market requirements;
- expected community, regional, state or notional economic benefits (including anticipated capital expenditure, peak construction and operational jobs on a FTE basis;
- other expected benefits;
- the justification for the scale of tourist development proposed within the local and regional context;
- the justification for the amount of retail and commercial floor space proposed within the local and regional context; and
- the impact of the proposed commercial and retail facilities on existing retail centres in the area.
- The impact of the proposal on existing local businesses including the dive industry, the recreational and commercial fishing industry and tourist cruise operators.

## 2.2 Alternatives to the Project

This section should describe feasible alternatives, including conceptual, technological and locality alternatives to the project, and discussion of the consequences of not proceeding with the project. Alternatives should be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and courses of action and rejecting others. Comparative environmental impacts of each alternative should be summarised.

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

Reasons for selecting the preferred options should include technical, commercial, social and natural environment aspects. In particular, the principles of ESD and sustainable development should be included. The relationship of options chosen for waste management and any emissions produced should be detailed.

This information is required to assess why the scope of the proposal is as it is and to ensure that the ESD principles and sustainable development aspects have been considered and incorporated during the scoping and planning of the proposal.

# 3 Description of the project

The objective of this section is to describe the project through its lifetime of construction and operation. This information is required to allow assessment of all aspects of a proposal including all phases of the proposal from planning, construction and operation. It also allows further assessment of which approvals may be required and how they may be managed through the life of the proposal.

The various elements of the project should be described in the text and illustrated with maps, diagrams, architectural plans and artist's impressions, as required. Issues to be addressed should include, but may not be limited to:

- location of the development site in relation to protected areas (e.g. Ramsar, Fish Habitat Areas and Moreton Bay Marine Park);
- proposed land uses of the buildings, structures, marine infrastructure, other facilities including site access and exits, services access, landscaping and beautification proposals (including types of plants to be used e.g. native or exotic), distance to boundaries;
- dimensions and visual impact of proposed buildings and structures – include concept drawings, outline perspective or elevation drawings;
- details of proposed capital works necessary for upgrading the navigability of the Seaway and the Broadwater including dredging of the entrance channel, swing basin, cruise ship berth area and the marina area (including any "insurance" dredging requirements) and any proposed extension of the training wall(s);
- modifications to the sand bypassing system, including the pipeline across the Seaway;
- indicative layout, size and number of marina berths;
- stages of development;
- final land tenure and leasehold requirements;
- location and scope of public infrastructure in Doug Jennings Park and other public spaces.
- extent of vegetation areas and buffer zones in and surrounding the development;
- location and layout of retail and commercial facilities;
- details of infrastructure and service provision for development and operation of the project, including roads, pipelines and power lines;
- details of the location and extent of vehicular access and traffic and staff and visitor car parking impacts associated with the development;
- navigation, quarantine, security and other requirements associated with the operation of the cruise ship terminal;
- the nature, sources, location and quantities of all chemicals to be handled on site;
- the use of bunds, dry-break couplings and containment for fuel oils, gases and other environmentally hazardous substances during transfer, use and storage should be identified together with the development of appropriate contingency plans for containing and cleaning up spills;
- all activities, including chemical and mechanical, to be conducted on site;
- the amount and characteristics of solid and liquid wastes produced and method of disposal;
- details of sewage disposal for vessels utilising the marina and cruise ship terminal; and
- maintenance provisions for coastal structures and dredging works, including responsibility for maintenance works, maintenance dredge spoil disposal sites and monitoring requirements.

Details of the Concept Master Plan for the development, the staging of the development and the planning and infrastructure required to facilitate development and design details of all elements of the project which must take account of ultimate population and traffic thresholds associated with the project.

## 3.1 Location

### 3.1.1 Regional context

The regional context of the proposal should be described and illustrated on maps at suitable scales.

### 3.1.2 Local context

The local context of the proposal should be described and illustrated on maps at suitable scales. Real property descriptions of the project site should be provided.

## 3.2 Construction

If it is proposed that the development will be developed in stages based on a Concept Masterplan and various precincts, details of the likely staging of the development and timing of the staging are required to identify the infrastructure sequencing and the cumulative impact on both the site and surrounding locality.

A plan showing the likely sequencing of the development stages for the project should be incorporated. The extent and nature of the project's construction phase should be described. The description should include the type and methods of construction, the construction equipment to be used and transported to the construction site. The staging of the project should be described and illustrated showing site boundaries, development sequencing and timeframes. The estimated numbers of people to be employed in the project construction phase should also be provided with a brief description of where those people may be accommodated and/or how they will be transported to the site. In addition, the estimated number of residents, employees and tourist to be accommodated at each stage of the development is required.

Information is to be provided outlining the proposed timeframes for staged construction of the site. As part of the information, the proponent should provide a schedule for construction and development to occur outside periods of high rainfall, therefore limiting the potential impacts associated with runoff.

### 3.2.1 Dredging (construction and maintenance)

The following requirements for construction and maintenance dredging must be addressed:

- describe the location, area and volume of dredging required within the Broadwater and the Seaway for the proposed marina precinct, cruise ship terminal, swing basin and access channel;
- provide details of the grading and composition of likely dredged materials including potential contaminants and/or indurated layers and the methods and sites for disposal via land or sea;
- describe access to the disposal areas, the dimensions of disposal areas (both capital and maintenance) as well as any proposed tenure stipulations of any land to be designated dredge spoil disposal/rehandling areas;
- describe all alternatives to the proposed methods of dredged material disposal;
- determine the potential rate of sedimentation within the marina precinct, berth area, swing basin and entrance channel;
- quantify the expected amount of maintenance dredging required, the expected frequency of maintenance dredging and the expected composition of dredged material;
- describe provisions for maintenance dredging in the event of a major cyclone, flood or other extreme conditions;
- provide details of the dredging methods including timing of capital dredging and dredge material disposal in terms of avoiding or minimising impacts on fish behaviour, including migrations and marine plant propagation. The likely duration and frequency of maintenance dredging and dredge material disposal needs to be examined in the same context;
- describe the methods of minimising dredging plumes and water quality contaminant release criteria which cannot be exceeded during dredging activities such that dredging must cease;
- describe any requirements of the dredging program that may be required to avoid or minimise interruption of the existing operation of the sewage outfall in the Seaway; and
- describe arrangements to be put in place for long-term management of maintenance dredging operations and how the dredge material disposal site is to be managed including details of the party responsible for the long-term maintenance dredging operations.

## 3.3 Operations

The location and nature of the processes to be used should be described in the text and illustrated with maps, diagrams and artist's impressions as required. Operational issues to be addressed should include, but may not be limited to:

- a description of plant and equipment to be employed;
- the capacity of plant and equipment;
- maintenance dredging requirements listed in 3.2.1 above;

- details of the predicted usage of the cruise ship terminal including frequency of visits and potential accommodation of military vessels;
- detailed requirements of cruise ship operations including tugs, pilotage, channel closures, security arrangements etc; and
- potential ancillary uses of the cruise ship terminal facility and alternative uses of the facility during periods when cruise ships are not present.

Concept and layout plans should be provided highlighting proposed buildings, structures and plant and equipment. The nature, sources, location and quantities of all materials to be handled, including the storage and stockpiling of raw materials, should be described.

## 3.4 Land Tenure

Maps at suitable scales should be provided showing the precise location of the project area, and in particular:

- the location and boundaries of land tenures, in place or proposed, to which the project area is or will be subject;
- the location and boundaries of the project footprint showing all key aspects including excavations, stockpiles, areas of fill, watercourses, plant locations, water storages, buildings, bridges, culverts, hardstands, car parks, etc; and
- the location of any proposed buffers surrounding the working areas.

Consideration should be given to providing a rectified air photo enlargement to illustrate components of the project in relation to the land tenures and natural and built features of the area.

Details of the final tenure of the land following development including details of future reconfigurations, Community Title, Conservation Covenants/Agreements, Reserves or Nature Refuges over the land and including a supporting plan, for the entire site. Such details should include:

- The nature and structure of any future reconfigurations to be established for the various components of the development, including access;
- Further information concerning proposed legal arrangements for the management of the site and the ability of a managing entity to:
    - manage the staging of the development;
    - set standards and control the design and finish of structures and roads;
    - manage traffic; and
    - manage the production of interpretative material and signage.
- The general terms to form part of the management structure for the protection and maintenance of the open space areas, and in particular, the areas to be retained under vegetation;
- A statement clearly defining the responsibility (if any) of Council or any other State Agency in on-going maintenance of either infrastructure established within the subject site or open space areas within the site.

## 3.5 Infrastructure Requirements

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

### 3.5.1 Road Transport

Describe arrangements for the transport of plant, equipment, products, wastes and personnel during both the construction phase and operational phases of the project. The description should address the use of existing facilities and all requirements for the construction, upgrading or relocation of any transport related infrastructure.

Information should be provided on road transportation requirements on public roads for both construction and operations phases, including:

- the volume, composition (types and quantities), origin and destination of goods to be moved including construction materials, plant, raw materials, wastes, hazardous materials;
- the volume of traffic generated by workforce personnel, visitors and service vehicles. This should include an estimate of the peak traffic loads associated with the arrival or departure of a cruise ship, and the traffic associated with usage of the marina precinct;
- method of movement (including vehicle types and number of vehicles likely to be used);
- anticipated times at which movements may occur;
- details of vehicle traffic and transport of heavy and oversize indivisible loads (including types and composition);
- the proposed transport routes; and
- need for increased road network capacity, car parking facilities, road maintenance and upgrading.

A proposal would also need to consider public transport requirements and links to, or development of pedestrian and cycle networks.

### 3.5.2 Energy

The EIS should describe all energy requirements, including electricity, natural gas, and/or solid and liquid fuel requirements for the construction and operation of the proposal. The locations of any easements should be shown on the infrastructure plan. Energy conservation should be briefly described in the context of any Commonwealth, State and local government policies.

### 3.5.3 Water supply and storage

The EIS should provide information on water usage by the project, including the quality and quantity of all water supplied to the site. In particular, the proposed and optional sources of water supply should be described (eg. bores, any surface storages such as dams and weirs, municipal water supply pipelines).

Estimated rates of supply from each source (average and maximum rates) should be given. Any proposed water conservation and management measures should be described.

Determination of potable water demand should be made for the project, including the temporary demands during the construction period as well as on-going demand from visiting cruise ships and other vessels. Details should be provided of any existing town water supply to meet such requirements. If water storage and treatment is proposed on site, for use by the site workforce, then this should be described.

### 3.5.4 Stormwater drainage

A description should be provided of the proposed stormwater drainage system and the proposed disposal arrangements, including any off-site services. A Stormwater Management Plan should be prepared for the site.

### 3.5.5 Sewerage

This section should describe, in general terms, the sewerage infrastructure required by the project including the location and capacity of sewage reception and handling facilities associated with the cruise ship terminal and the marina.

Information is required on the on site treatment of grey water including ownership, maintenance safeguards to be used, how discharge standards are to be met, details of proposed wet weather storage (locations and capacities proposed).

If a treatment system is proposed for the development, further information is required on:

- The options proposed for wastewater treatment;
- The peak design capacity evaluation of the wastewater treatment system and associated infrastructure using equivalent persons;
- Determination of the potential emergency effluent storage that would be required in an extended rain event (50 and 100 year ARIs);
- The siting and maintenance regime for the system.

### 3.5.6 Telecommunications

The EIS should describe any impacts on existing telecommunications infrastructure (such as optical cables, microwave towers, etc.) and identify the owners of that infrastructure.

## 3.6 Waste management

### 3.6.1 Character and quantities of waste materials

Provide an inventory of all wastes to be generated by the proposal during the construction and operational phases of the project, including wastes generated by visiting cruise ships and other vessels. In addition to the expected total volumes of each waste produced, include an inventory of the following per unit volume of product produced:

- the tonnage of raw materials processed;
- the amount of resulting wastes; and
- the volume and tonnage of any re-usable by-products.

Having regard for best practice waste management strategies and the Environmental Protection (Waste) Policy, the proposals for waste avoidance, reuse, recycling, treatment and disposal should be described in the appropriate sub-section below. Information should also be provided on the variability, composition and generation rates of all waste produced at the site.

#### 3.6.1.1 Air emissions

Describe in detail the quantity and quality of all air emissions (including particulates and odours) from the project during construction and operation, including times when cruise ships are in port. Particulate emissions include those that would be disturbed by wind action equipment during construction (e.g. trucks by passage on unsealed roads).

#### 3.6.1.2 Solid waste disposal

The proposed location, site suitability, dimensions and volume of any landfill requirements for solid wastes generated by the project. Describe the waste collection services for the Spit area.

#### 3.6.1.3 Liquid waste

A description should be presented of the origin, quality and quantity of wastewater originating from the project and visiting cruise ships and vessels.

The EIS may need to consider the following effects:

- groundwater from excavations;
- rainfall directly onto disturbed surface areas;
- run-off from roads, plant and chemical storage areas;
- drainage (i.e. run-off plus any seepage or leakage);
- seepage from other waste storages;
- water usage for:
  - dust suppression, and
  - domestic purposes.

- evaporation;
- domestic sewage treatment - disposal of liquid effluent and sludge;
- sewage pumpout from cruise ships and vessels in the marina facilities;
- water supply treatment plant - disposal of wastes.

# 4 Environmental values and management of impacts

The functions of this section are:

- To describe the existing environmental values of the area which may be affected by the proposal. Environmental values are defined in section 9 of the *Environmental Protection Act 1994*, environmental protection policies and other documents such as the ANZECC 2000 guidelines and South East Queensland Regional Water Quality Management Strategy. Environmental values may also be derived following recognised procedures, such as described in the ANZECC 2000 guidelines. Environmental values should be described by reference to background information and studies, which should be included as appendices to the EIS.
- To describe the potential adverse and beneficial impacts of the proposal on the identified environmental values. Any likely environmental harm on the environmental values should be described. Impacts on areas indirectly affected by the project (eg. marine plants potentially affected by silt plumes in protected areas such as the Moreton Bay Marine Park) should also be described and analysed.
- To describe any cumulative impacts on environmental values caused by the proposal, either in isolation or by combination with other known existing or planned sources of contamination.
- To present environmental protection objectives and the standards and measurable indicators to be achieved. and
- To examine viable alternative strategies for managing impacts. These alternatives should be presented and compared in view of the stated objectives and standards to be achieved. Available techniques, including best practice, to control and manage impacts to the nominated objectives should be discussed. This section should detail the environmental protection measures incorporated in the planning, construction, operations, decommissioning, rehabilitation and associated works for the proposal. Measures should minimise environmental harm and maximise socio-economic and environmental benefits of the proposal. Preferred measures should be identified and described in more detail than other alternatives.

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

This section should address all elements of the environment, (such as land, water, coast, air, waste, noise, nature conservation, cultural heritage, social and community, health and safety, economy, hazards and risk) in a way that is comprehensive and clear. To achieve this, the following issues should be considered for each environmental value relevant to the project:

- Environmental values affected: describe the existing environmental values of the area to be affected including values and areas that may be affected by any cumulative impacts (refer to any background studies in Appendices - note such studies may be required over several seasons). It should be explained how the environmental values were derived (e.g. by citing published documents or by following a recognised procedure to derive the values).
- Impact on environmental values: describe quantitatively the likely impact of the proposal on the identified environmental values of the area. The cumulative impacts of the proposal must be considered over time or in combination with other (all) impacts in the dimensions of scale, intensity, duration or frequency of the impacts. In particular, any requirements and recommendations of relevant

State planning policies, environmental protection policies, national environmental protection measures and integrated catchment management plans should be addressed.

Cumulative impacts on the environmental values of land, air and water and cumulative impacts on public health and the health of terrestrial, aquatic and marine ecosystems must be discussed in the relevant sections. This assessment may include air and water sheds affected by the proposal and other proposals competing for use of the local air and water sheds.

Where impacts from the proposal will not be felt in isolation to other sources of impact, it is recommended that the proponent develop consultative arrangements with other industries in the proposal's area to undertake cooperative monitoring and/or management of environmental parameters. Such arrangements should be described in the EIS.

- Environmental protection objectives: describe qualitatively and quantitatively the proposed objectives for enhancing or protecting each environmental value. Include proposed indicators to be monitored to demonstrate the extent of achievement of the objective as well as the numerical standard that defines the achievement of the objective (this standard must be auditable). The measurable indicators and standards can be determined from legislation, support policies and government policies as well as the expected performance of control strategies. Objectives for progressive and final rehabilitation and management of contaminated land should be included.
- Control strategies to achieve the objectives: describe the control principals, proposed actions and technologies to be implemented that are likely to achieve the environmental protection objectives; include designs, relevant performance specifications of plant. Details are required to show that the expected performance is achievable and realistic.
- Monitoring programs: describe the monitoring parameters, monitoring points, frequency, data interpretation and reporting proposals.
- Auditing programs: describe how progress towards achievement of the objectives will be measured, reported and whether external auditors will be employed. Include scope, methods and frequency of auditing proposed.
- Management strategies: describe the strategies to be used to ensure the environmental protection objectives are achieved and control strategies implemented eg. continuous improvement framework including details of corrective action options, reporting (including any public reporting), monitoring, staff training, management responsibility pathway, and any environmental management systems and how they are relevant to each element of the environment.
- Information quality: information given under each element should also state the sources of the information, how recent the information is, how any background studies were undertaken (eg intensity of field work sampling), how the reliability of the information was tested, and what uncertainties (if any) are in the information.

It is recommended that the final ToR and the EIS follow the heading structure shown below. The mitigation measures, monitoring programs, etc., identified in this section of the EIS should be used to develop the environmental monitoring program for the project (see section 5).

## 4.1 Land

### 4.1.1 Description of environmental values

This section describes the existing environment values of the land area that may be affected by the proposal. It should also define and describe the objectives and practical measures for protecting or enhancing land-based environmental values, describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

#### 4.1.1.1 Topography/geomorphology

Maps should be provided locating the project in both regional and local contexts. The topography of the proposal site should be detailed with contours at suitable increments, shown with respect to Australian Height Datum (AHD). Significant features of the locality should be included on the maps. Such features would include any locations subsequently referred to in the EIS (e.g. the nearest noise sensitive locations)

that are not included on other maps. Commentary on the maps should be provided highlighting the significant topographical features.

#### 4.1.1.2 Geology

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

#### 4.1.1.3 Soils

A soil survey of the sites affected by the proposal should be conducted at a suitable scale, with particular reference to the physical and chemical properties of the materials that will influence erosion potential and storm water run-off quality. Information should also be provided on soil stability and suitability for construction of proposal facilities.

An acid sulfate soil investigation, carried out according to QASSIT guidelines, should be undertaken. The State Planning Policy 2/02 Planning and Managing Development involving Acid Sulfate Soils should also be addressed (e.g. identification and management and format of environmental management plans).

#### 4.1.1.4 Land use

The EIS should provide a description of current land tenures and land uses, including native title issues, in the proposal area, with particular mention of land with special purposes. The location and owner/custodians of native title in the area and details of native title claims should be shown. The EIS should also discuss the tenure history of the site, whether there have been any native title extinguishing events and if native title may continue to exist.

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

Provide a land suitability map of the proposed and adjacent area, and setting out land suitability and current land uses.

#### 4.1.1.5 Infrastructure

The location and owner/custodians of all tenures, reserves, roads and road reserves covering the affected land should be shown on maps of a suitable scale. Indicate locations of gas and water pipelines, power lines and any other easements. Describe the environmental values affected by this infrastructure.

#### 4.1.1.6 Sensitive environmental areas

The EIS should identify whether areas that are environmentally sensitive could be affected, directly and indirectly, by the proposal. Areas sensitive to environmental harm caused by the proposal can be determined through site-specific environmental impact assessment.

In particular, the EIS should indicate if the land affected by the proposal is, or is likely, to become part of the protected area estate, or is subject to any treaty. Consideration should be given to national parks, conservation parks, declared fish habitat areas, wilderness areas, aquatic reserves, heritage/historic areas or items, national estates, world heritage listings and sites covered by international treaties or agreements (e.g. Ramsar, JAMBA, CAMBA), areas of cultural significance and scientific reserves (see section 4.7 for further guidance on sensitive areas).

To obtain copies of plans of declared fish habitat areas contact Queensland Fisheries Service of the QDPI at the call center 13 25 23.

In addition, the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* should be addressed and a determination should be made whether there are national environmentally significant matters that should be described. The proximity of the proposal elements to any of these areas should be identified.

#### 4.1.1.7 Landscape character

This section should describe in general terms the existing character of the landscape that will be affected by the proposal. It should comment on any changes that have already been made to the natural landscape since European settlement. It should 'set the scene' for the description of particular scenic values in the following section on visual amenity. The difference being that this section describes the general impression of the landscape that would be obtained while travelling through and around it, while the visual amenity section addresses particular panoramas and views (e.g. from constructed lookouts, designated scenic routes, etc.) that have amenity value.

#### 4.1.1.8 Visual amenity

This section should describe existing landscape features, panoramas and views that have, or could be expected to have, value to the community whether of local, regional, State-wide, national or international significance. Information in the form of maps, sections, elevations and photographs is to be used, particularly where addressing the following issues:

- identification of elements within the proposal and surrounding area that contribute to their image of the town/city as discussed in the local government plan scheme - city image and townscape objectives and associated maps;
- major views, view sheds, existing viewing outlooks, ridgelines and other features contributing to the amenity of the area, including assessment from private residences in the affected area including residents on the Western side of the Broadwater;
- focal points, landmarks (built form or topography), gateways associated with project site and immediate surrounding areas, waterways, and other features contributing to the visual quality of the area and the project site;
- character of the local and surrounding areas including character of built form (scale, form, materials and colours) and vegetation (natural and cultural vegetation) directional signage and land use;
- identification of the areas of the proposal that have the capacity to absorb land use changes without detriment to the existing visual quality and landscape character; and
- the value of existing vegetation as a visual screen.

The assessment is to address the visual impacts of the project and associated infrastructure, using appropriate simulation. Sketches, diagrams, computer imaging and photos are to be used where possible to portray the near views and far views of the completed development and their surroundings from visually sensitive locations.

### 4.1.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing the land-based environmental values identified through the studies outlined in the previous section. It should describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

#### 4.1.2.1 Land use suitability

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

The potential environmental harm caused by the proposal on the adjacent areas currently used for urban development, recreation, tourism, other business and the implications of the proposal for future developments in the impact area including constraints on surrounding land uses should be described. If the development adjoins or potentially impacts on other land uses, then an assessment of the potential for land use conflict is required.

Outline incompatible land uses, whether existing or potential, adjacent to all aspects of the project, including essential and proposed ancillary developments or activities and areas directly or indirectly affected by the construction and operation of these activities should be identified and measures to avoid unacceptable impacts defined.

#### 4.1.2.2 Land contamination

The EIS should describe the possible contamination of land from aspects of the proposals including waste, reject product, acid generation from exposed sulfidic material and spills at chemical and fuel storage areas.

The means of preventing land contamination (within the meaning of the *Queensland Environmental Protection Act 1994*) should be addressed. Methods proposed for preventing, recording, containing and remediating any contaminated land should be outlined. Intentions should be stated concerning the classification (in terms of the Queensland Contaminated Land Register) of land contamination.

A Preliminary Site Investigation (PSI) of the site consistent with the EPA's "Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland" (Refer to References section – Queensland EPA, 1998) should be undertaken to determine background contamination levels. The results of the PSI should be summarised in the EIS and provided in detail in an appendix.

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

In short, the following information may be required in the EIS:

- mapping of any areas listed on the Environmental Management Register or Contaminated Land Register under the *Environmental Protection Act 1994*;
- identification of any potentially contaminated sites not on the registers which may need remediation; and
- a description of the nature and extent of contamination at each site and a remediation plan and validation sampling.

The EIS should address management of any existing or potentially contaminated land in addition to preventing and managing land contamination resulting from project activities. The Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland can be downloaded from the EPA website at: www.epa.qld.gov.au/environment/business/contaminated). Proponents should refer study proposals to the EPA for review prior to commencement (Consult with the Contaminated Land Section in the Queensland EPA).

#### 4.1.2.3 Soil erosion

For all permanent and temporary landforms, 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. An erosion-monitoring program, including rehabilitation measures for erosion problems identified during monitoring, should also 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 such as:

- building footprints (development precincts);
- access roads or other transport corridors;
- designated infrastructure precincts;
- recreational areas; and
- creeks.

Methods proposed to prevent or control erosion should be specified and should be developed with regard to (a) preventing soil loss in order to maintain land capability/suitability, and (b) preventing significant degradation of local waterways by suspended solids.

Management of acid sulfate soils should be based on assessment in accordance with the *Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland 1998 (Revision 4.0)* and management and monitoring plans prepared in consultation with officers of the Department of Natural

Resources and Mines and the Environmental Protection Agency. Reference should be made to the *Instructions for the treatment and management of acid sulfate soils, 2001* (EPA).

#### 4.1.2.4 Landscape character

Describe the potential impacts of the project landscape character of the site and the surrounding area. Particular mention should be made of any changes to the broad-scale topography and vegetation character of the area, such as due to spoil dumps, excavated voids and broad-scale clearing.

Details should be provided of measures to be undertaken to mitigate or avoid the identified impacts.

#### 4.1.2.5 Visual amenity

This section should analyse and discuss the visual impact of the proposal on particular panoramas and outlooks. It should be written in terms of the extent and significance of the changed skyline as viewed from places of residence, work, and recreation, from road, cycle and walkways, from the air and other known vantage points day and night, during all stages of the project as it relates to the surrounding landscape. The assessment is to address the visual impacts of the project structures and associated infrastructure, using appropriate simulation. Sketches, diagrams, computer imaging and photos are to be used where possible to portray the near views and far views of the completed structures and their surroundings from visually sensitive locations. Special consideration is to be given to public roads, public thoroughfares, and places of residence or work, which are within the line-of-sight of the project.

Detail should be provided of all management options to be implemented and how these will mitigate or avoid the identified impacts.

#### 4.1.2.6 Lighting

Management of the lighting of the project, during all stages, is to be provided, with particular reference to objectives to be achieved and management methods to be implemented to mitigate or avoid:

- the visual impact at night, in particular, when a cruise ship or other large vessel is in port;
- night operations/maintenance and effects of lighting on fauna and residents;
- the potential impact of increased vehicular traffic; and
- changed habitat conditions for nocturnal fauna and associated impacts.

#### 4.1.2.7 Transport

The EIS should provide sufficient information to make an independent assessment of how the State-controlled and local government road networks will be affected. The impact on stakeholders, including local residents along the whole route should be detailed and how any impacts will be managed.

Details should be provided of the impacts on environmental values of any new roads or road realignments, in particular any proposed access to and through The Spit area. The EIS should include detailed analysis of probable impact of identified construction and operational traffic generated by the project with particular concern to impacts on road infrastructure, road users and road safety.

The EIS needs to identify impacts on the State-controlled and local government road networks and to indicate clearly the corrective measures necessary to address adverse road impacts and the costs involved. This will require the proponent to compare the traffic situation and road conditions with, and without, the project.

Information about the impacts and proposed measures for dealing with those impacts should be prepared by the proponent in close consultation with the local District Office of the Department of Main Roads and the Gold Coast City Council.

The EIS should outline details of any potential impacts on existing or proposed pedestrian and cycle networks.

## 4.2 Climate

This section should describe the rainfall patterns (including magnitude and seasonal variability of rainfall), air temperatures, humidity, wind (direction and speed) and any other special factors (eg temperature inversions) that may affect air quality within the region of the proposal. Extremes of climate (droughts, floods, cyclones, etc) should also be discussed with particular reference to water management at the proposal 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. Reference must be made to any studies undertaken by the Gold Coast City Council in relation to flooding and storm tide vulnerability.

The potential impacts due to climatic factors should be addressed in the relevant sections of the EIS. The impacts of rainfall on soil erosion should be addressed and the impacts of winds, rain, humidity and temperature inversions on air quality should also be addressed.

## 4.3 Water resources

### 4.3.1 Description of environmental values

This section describes the existing environment for water resources that may be affected by the proposal in the context of environmental values as defined in such documents as the *Environmental Protection Act 1994*, Environmental Protection (Water) Policy 1997, ANZECC 2000.

Where a licence or permit will be required under the *Water Act 2000* to take or interfere with the flow of water, this section of the EIS should provide sufficient information for a decision to be made on the application.

#### 4.3.1.1 Surface waterways

A description should be given of the surface watercourses and their quality and quantity in the area affected by the proposal with an outline of the significance of these waters to the river catchment system in which they occur (NB impacts on coastal waters should be discussed in Section 4.4 (Coastal environment)). Details provided should include a description of existing surface drainage patterns. Also provide details of the likelihood of flooding, history of flooding including extent, levels and frequency. Flood studies should include a range of annual exceedance probabilities for affected waterways, where data permits.

#### 4.3.1.2 Groundwater

The EIS should review the quality, quantity and significance of groundwater in the proposal area.

### 4.3.2 Potential impacts and mitigation measures

This section is to assess potential impacts on water resource environmental values identified in the previous section. It will also define and describe the objectives and practical measures for protecting or enhancing water resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

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

Water management controls should be described, addressing surface and groundwater quality, quantity, drainage patterns and sediment movements. The beneficial (environmental, production and recreational) use of nearby marine, surface and groundwater should be discussed, along with the proposal for the diversion of affected creeks and the stabilisation of those works. Monitoring programs should be described which will assess the effectiveness of management strategies for protecting water quality during the construction and operation of the proposal.

Key water management strategy objectives include:

- protection of the integrity of the marine environment;
- protection of important local aquifers and protection of their waters;

- 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 the littoral zone); and
- minimisation of impacts on flooding levels and frequencies both upstream and downstream of the project.

Strategies for protecting Ramsar areas 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.

#### 4.3.2.1 Surface water and water courses

The potential environmental harm to the flow and the quality of surface waters from all phases of the proposal should be discussed, with particular reference to their suitability for the current and potential downstream uses, including the requirements of any affected riparian area, wetland, estuary, littoral zone, and any marine and in-stream biological uses. The impacts of surface water flow on existing infrastructure should be considered. Refer to the Environmental Protection (Water) Policy 1997 and *Water Act 2000*.

The hydrological impacts of the proposal should be assessed, particularly with regard to stream diversions, scouring and erosion, and changes to flooding levels and frequencies both upstream and downstream of the project. Modelling of afflux should be provided and illustrated where appropriate. Assessment of impacts on the flow and the quality of surface waters and effects on ecosystems should include an assessment of the likely effects on mangrove and other estuarine habitats as a result of any temporary diversion of existing water courses.

Consideration should be given to monitoring of seawater quality at points of outflow.

Quality characteristics discussed should be those appropriate to the downstream and upstream water uses that may be affected. Chemical and physical properties of any waste water (including concentrations of constituents) at the point of entering natural surface waters should be discussed along with toxicity of effluent constituents to flora and fauna.

In relation to water supply and usage, and wastewater disposal, the EIS should discuss anticipated flows of water to and from the proposal area.

Having regard for the requirements of the Environmental Protection (Water) Policy, the EIS should present the methods to avoid stormwater contamination by wastes and present the means of containing, recycling, reusing, treating and disposing of stormwater.

The Australian and New Zealand Environment and Conservation Council (ANZECC, 2000) 'National Water Quality Management Strategy, Australian Water Quality Guidelines for Fresh and Marine Waters' and the Environmental Protection (Water) Policy 1997 should be used as a reference for evaluating the effects of various levels of contamination.

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.

#### 4.3.2.2 Groundwater

The EIS should include an assessment of the potential environmental harm caused by the proposal to local groundwater resources.

The impact assessment should define the extent of the area within which groundwater resources are likely to be affected by the proposed operations and the significance of the proposal to groundwater depletion or recharge, and propose management options available to monitor and mitigate these effects.

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

## 4.4 Coastal environment

### 4.4.1 Description of environmental values

This section describes the existing coastal environment, which may be affected by the proposal in the context of coastal values identified in State of the Coastal Zone Reports and environmental values as defined by the *Environmental Protection Act 1994* and environmental protection policies. The Environmental Protection (Water) Policy has a set of default environmental values for waterways that include aquatic ecosystem protection.

This section should also identify actions associated with the project that are assessable development within the coastal zone and will require assessment under the provisions of the *Coastal Protection and Management Act 1995*.

#### 4.4.1.1 Water quality

Provide baseline information on water quality in the sea and in estuaries below the limit of tidal influence, including heavy metals, acidity, turbidity and oil in water. Discuss the interaction of freshwater flows with marine waters its significance in relation to marine flora and fauna adjacent to the proposal area.

Describe the environmental values of the coastal seas of the affected area in terms of:

- values identified in the Environmental Protection (Water) Policy;
- the State Coastal Management Plan;
- assessment of existing water quality of the Broadwater, including any seasonal variations that occur, through either monitoring or using recent available published data. This assessment is to establish baseline water quality in the area, at different seasons, against which potential impacts of the proposal can be considered. The assessment is to include parameters such as, but not limited to, total and dissolved organic carbon, pH, dissolved oxygen, suspended solids, turbidity, total nitrogen, total phosphorous, total and dissolve aluminium, total and dissolved iron, faecal coliforms, and chlorophyll a;
- describe the water quality objectives required to protect the environmental values identified, including why they are suitable indicators for the environmental values (protocols must be consistent with the Environmental Protection (Water) Policy 1997 see especially Part 3 and Part 4 – refer to proposed EPP scheduling). Provide details on how the water quality objectives have been derived for the dredging/reclamation activities.
- Describe the interaction of tidal and freshwater flows in relation to the assimilation and transport of pollutants entering marine waters from, or adjacent to, the proposal area.

#### 4.4.1.2 Hydrology and hydrodynamics

Describe the tidal hydrodynamics of the Broadwater and the adjoining tidal waterways in terms of water levels and current velocities and directions at different tidal states. Two and three-dimensional modelling should be undertaken where appropriate for the determination of impacts to the Broadwater and upstream impacts. Provide details of water levels and flows associated with historical and predicted storm surges.

Describe the wave climate in the vicinity of the Seaway and the adjacent beaches including a description of inter-annual variability and details of historical and predicted extreme wave conditions generated by tropical cyclones or other severe storm events.

Describe the hydrology of the area and the adjacent catchments of the Nerang, Coomera and Pimpama Rivers and the associated freshwater flows within the Broadwater and the adjoining tidal waterways in terms of water levels and discharges. The interaction of freshwater flows with different tidal states, including storm tides, should also be provided. Provide a description of inter-annual variability and details of historical and predicted floods including extent, levels and frequency. Flood studies should include a range of annual exceedance probabilities for affected waterways, where data permits.

#### 4.4.1.3 Coastal processes

Provide on suitable scale maps details of bathymetry (at a minimum of 0.5m contour increments or finer if practicable) and sediment transport rates and directions for a range of indicative tide and wave conditions.

Describe the nature and characteristics of coastal erosion and sedimentation within the project area and the adjacent beaches and Broadwater. Provide details of the changes in coastal morphology in the area prior to, and since construction of the Seaway.

Describe the environmental values of the coastal resources of the affected area in terms of the physical integrity and morphology of landforms created or modified by coastal processes.

Describe the recreational uses and amenity of the beaches and tidal waterways within and adjoining the project site with particular reference to the surfing amenity provided by the construction of the Seaway and the sand bypassing system.

Provide an assessment of physical and chemical characteristics of sediments within the littoral and the marine zone adjacent to the proposal area. Outline the dominant ecological processes, including nutrient and organic matter cycling and the key limiting physical factors to the ecological processes.

### 4.4.2 Potential impacts and mitigation measures

The EIS must demonstrate the proposal's consistency with the State Coastal Management Plan and its policies. In particular, the EIS must address the proposal's consistency with policy criteria in Policy 2.1.5 Maritime infrastructure, 2.1.8 Dredging, 2.3 Public access to the coast, 2.4 Water quality and 2.8.3 Biodiversity.

Specific issues to be addressed associated with physical coastal processes include:

- The potential impacts of the proposed works on tidal hydrodynamics including changes to flow velocities and water levels in the Broadwater and adjoining tidal waterways.
- The associated potential for accelerated bank erosion or damage to existing revetment structures within tidal waterways upstream from the project site.
- The potential for increased vulnerability to storm tide flooding.
- The potential for increased vulnerability to flooding of upstream floodplains.
- The likely changes to the coastal morphology of the area including the southern Broadwater, the ebb delta of the Seaway and the adjacent beaches. This should include a quantification of the potential inter-annual variability of sedimentation within critical project areas such as the proposed entrance channel, swing basin and the marina precinct.
- Potential threats to the stability of Seaway training walls and the sand bypassing pipeline caused by the proposed dredging and the altered tidal flows and increased wave penetration.
- The likely changes to the recreational amenity of the coastal zone caused by the direct impacts of the proposed works and the associated changes to the coastal morphology with particular reference to the surfing quality at the southern end of South Stradbroke Island.

The water quality objectives and practical measures for protecting or enhancing coastal environmental values are to be defined and described, including how nominated quantitative standards and indicators may be achieved, and how the achievement of the water quality objectives will be monitored, audited and managed. The potential environmental harm caused by the proposal on coastal resources and processes should be described in the context of controlling such effects. *The State Planning Policy – Planning and Managing Development involving Acid Sulfate Soils 2002* should be addressed as should the *State Coastal Management Plan 2001* and QDPI Guidelines for Marine Areas.

Specific issues to be addressed include:

- Describing the water quality objectives used (including how they were developed), and how predicted activities will meet these objectives (refer to the EPA's Queensland Water Quality guidelines and the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, ANZECC, 2000).
- Changes to the water quality impacts of the existing sewage outfall within the Seaway as a result of alterations to the entrance configuration and associated tidal flows.
- Potential threats to the water quality and sediment quality within and adjacent to the proposed marina precinct and cruise ship berth area associated with the operation of the facilities including potential accidental discharges from cruise ships. This assessment shall also consider the water quality of the sand bypassing system clear water intake located within the Marine Stadium.
- If relevant, the effect of potential mitigation options including additional dredging or other works designed to improve tidal flushing should be examined.
- Potential threats to water quality associated with the capital and maintenance dredging operations.
- Maintaining the integrity of sea water supplies drawn from the Broadwater by Seaworld.
- The role of buffer zones in sustaining fisheries resources through maintaining connectivity between coastal and riparian vegetation and estuarine and freshwater reaches of catchments should be discussed.

Strategies for protecting Ramsar areas 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.

## 4.5 Waste

This section should complement other sections of part 4 of the EIS by providing technical details of waste treatment and minimisation, with proposed emission, discharge and disposal criteria, while other sections describe how those emissions, discharges and disposals would impact on the relevant environmental values. The purpose of this format is to concentrate the technical information on waste management into one section in order to facilitate its transfer into the EM Plan.

### 4.5.1 Description of environmental values

This section describes the existing environment values that may be affected by the project's wastes. Refer to each of the waste streams described in section 3.6 and provide references to environmental values described in other sections of part 4 of the EIS.

### 4.5.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values from impacts by wastes, describes how nominated quantitative standards and indicators may be achieved for waste management, and how the achievement of the objectives will be monitored, audited and managed.

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

- on-site treatment methods proposed for the wastes;
- methods of disposal (including the need to transport wastes off-site for disposal) proposed to be used for any trade wastes, liquid wastes and solid wastes;
- the potential level of impact on environmental values;
- proposed discharge/disposal criteria for liquid and solid wastes;
- methods to prevent, seepage and contamination of groundwater from stockpiles and/or dumps should be given; and
- waste minimisation techniques processes proposed.

Having regard for the Environmental Protection (Waste) Policy, the EIS should indicate the results of investigation into the feasibility of using waste minimisation and cleaner technology options during all phases of the proposal. The EPA has also released draft guidelines covering aspects of waste management under this EPP, which should be addressed.

## 4.6 Noise and vibration

### 4.6.1 Description of environmental values

This section describes the existing environment values that may be affected by noise and vibration from the proposal and visiting cruise ships.

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 proposal. Noise sensitive places are defined in the Environmental Protection (Noise) Policy 1997. Long-term measured background noise levels that take into account seasonal variations are required. 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 proposal should be described.

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

### 4.6.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing environmental values from impacts by noise and vibration, describes how nominated quantitative standards and indicators may be achieved for noise and vibration management, and how the achievement of the objectives will be monitored, audited and managed. The assessment of noise impacts should include matters raised in the document '*The health effects of environmental noise – other than hearing loss*' published by the enHealth Council, 2004 (or later editions), ISNB 0 642 82304 9.

Information, including mapped noise contours from a suitable acoustic model, should be submitted based on the proposed generation of noise. The potential environmental harm of noise and vibration at all potentially sensitive places, in particular, any place of work or residence should be quantified in terms of objectives, standards and indicators to be achieved. Particular consideration should be given to emissions of low-frequency noise; that is, noise with components below 200Hz. The assessment should also include environmental impacts on terrestrial and marine animals and avifauna, particularly migratory species. Proposed measures for the minimisation or elimination of impacts should be provided, including details and illustrations of any screening, lining, enclosing or bunding. A discussion should be provided of timing schedules for construction and operations with respect to minimising environmental nuisance and harm from noise.

Information should be supplied on blasting which might cause ground vibration or fly rock on, or adjacent to, the site with particular attention given to places of work, residence, recreation, worship and general amenity. The magnitude, duration and frequency of any vibration should be discussed. A discussion should be provided of measures to prevent or minimise environmental nuisance and harm. Blasting noise and vibration limits are provided in section 6I of the Environmental Protection Regulation 1998. Reference should also be made to the EPA Guideline: Noise and vibration from blasting.

The assessment should also address off-site noise and vibration impacts that could arise due to increased road directly resulting from the project.

## 4.7 Nature conservation

### 4.7.1 Description of environmental values

This section describes the existing environment values for nature conservation that may be affected by the proposal.

Describe the environmental values of nature conservation for the affected area in terms of:

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

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

A discussion should be presented on the nature conservation values of the areas likely to be affected by the proposal. The flora and fauna communities which are rare or threatened, environmentally sensitive localities including the marine environment, waterways, riparian zone, and littoral zone, rainforest remnants, old growth indigenous forests, wilderness and habitat corridors should be described. The description should include a plant species list, a vegetation map at appropriate scale and an assessment of the significance of native vegetation, from a local and regional and state perspective. The description should indicate any areas of state or regional significance identified in an approved biodiversity planning assessment (BPA) produced by the EPA.

The EIS should identify issues relevant to sensitive areas, or areas, which may have, low resilience to environmental change. Areas of special sensitivity include the marine environment and wetlands, wildlife breeding or roosting areas, any significant habitat or relevant bird flight paths for migratory species and habitat of threatened plants, animals and communities. The capacity of the environment to assimilate discharges/emissions should be assessed. Proposal proximity to any biologically sensitive areas should be described.

Reference should be made to both State and Commonwealth endangered species legislation and the proximity of the development to Ramsar areas.

The Queensland *Vegetation Management Act 1999* and the findings of any regional vegetation management plan should also be referenced.

The occurrence of pest plants and animals in the project area should be described.

Key flora and fauna indicators should be identified for future ongoing monitoring. Surveys of flora and fauna may need to be conducted throughout the year to reflect seasonal variation in communities and to identify migratory species.

The EPA should be consulted on the scope of any biological studies before they are undertaken.

#### 4.7.1.1 Terrestrial flora

For terrestrial vegetation a map at a suitable scale should be provided, with descriptions of the units mapped. Sensitive or important vegetation types should be highlighted, including any marine littoral and subtidal zone and riparian vegetation, and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types. The existence of rare or threatened species should be specifically addressed. The surveys should include species structure, assemblage, diversity and abundance. The description should contain a review of published information regarding the assessment of the significance of the vegetation to conservation, recreation, scientific, educational and historical interests.

The existence of important local and regional weed species should be discussed.

Vegetation mapping should provide data for all relevant project sites including the proposed cruise terminal and marina facilities. Adjacent areas may also require mapping.

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 type descriptions in accordance with The Conservation Status of Queensland's Bioregional Ecosystems. (Sattler P.S. & Williams R.D. 1997 2nd edition) and the current version of the EPA's listing of the conservation status of regional ecosystems (Regional Ecosystem Description Database [REDD]);
- location of vegetation types of conservation significance based on EPA's regional ecosystem types and occurrence of species listed as Protected Plants under the Nature Conservation (Wildlife) Regulation 1994 and subsequent amendments, as well as areas subject to the *Vegetation Management Act 1999*;

- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected area estate (National Parks, Conservation Parks, Resource Reserves, Nature Refuges);
- any plant communities of cultural, commercial or recreational significance should be identified; and
- location and abundance of any exotic or weed species.

#### 4.7.1.2 Terrestrial fauna

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

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

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

#### 4.7.1.3 Aquatic biology

If no biota surveys/studies have previously been conducted in and adjacent to the project area, the aquatic flora and fauna occurring in the areas affected by the proposal should be described, noting the patterns and distribution in the waterways. The description of the fauna and flora present or likely to be present in the area should include:

- fish species, mammals, reptiles, amphibians, crustaceans and aquatic invertebrates occurring in the waterways within the affected area;
- identification of the types and spatial distribution of economically important fish species, including their migration requirements;
- the principal fishes and crustaceans occurring in and adjacent to the development area should be listed, their recreational, traditional and commercial fisheries interest identified and their present abundance and distribution assessed;
- assessment of the impact of loss of tidal flats on juvenile and adult aquatic species leading to loss of productivity in fish, crustaceans etc;
- describe the loss of seagrasses in relation to the extent and regional significance of seagrass communities and associated impact on fisheries, dugongs, turtles etc;
- any rare or threatened marine species, particularly the dugong and its habitat;
- define the nature and extent of existing marine features such as littoral and sub-littoral lands, waterways, affected tidal and sub-tidal lands, corals and marine vegetation for example salt couch, seagrass, mangroves) within the proposed area of development and in the area immediately adjacent to the proposal;
- aquatic plants;
- aquatic and benthic substrate; and
- habitat potentially impacted by the project.

### 4.7.2 Potential impacts and mitigation measures

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

The EIS should address any actions of the project or likely impacts that require an authority under the *Nature Conservation Act 1992*, and/or would be assessable development for the purposes of the *Vegetation Management Act 1999*.

The discussion should cover all likely direct and indirect environmental harm due to the project on flora and fauna. Terrestrial and aquatic (marine and freshwater) environments should also be covered. Also include human impacts and the control of any domestic animals introduced to the area.

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

Strategies for collecting and preserving any significant fossils should be described.

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

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

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

Weed management strategies aimed at containing existing weed species (eg. parthenium and other declared plants) and ensuring no new declared plants are introduced to the area are required, and feral animal management strategies and practices should be addressed. The study should develop strategies to ensure that the project does not contribute to increased encroachment of a feral animal species. Reference should be made to the local government authority's pest management plan when determining control strategies. The strategies for both flora and fauna should be discussed in the main body of the EIS and provided in a working form in a Pest Management Plan as part of the overall EM Plan for the project.

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

Areas regarded as sensitive with respect to flora and fauna have one or more of the following features (and which should be identified, mapped, avoided or effects minimised):

- important habitats of species listed under the *Nature Conservation Act 1992* and/or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* as presumed extinct, endangered, vulnerable or rare;
- regional ecosystems listed as 'endangered' or 'of concern' under State legislation, and/or ecosystems listed as presumed extinct, endangered or vulnerable under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*;
- good representative examples of remnant regional ecosystems or regional ecosystems which are poorly represented in protected areas;
- sites listed under international treaties such as Ramsar wetlands and World Heritage areas;
- sites containing near threatened or bio-regionally significant species or essential, viable habitat for near threatened or bio-regionally significant species;

- sites in, or adjacent to, areas containing important resting, feeding or breeding sites for migratory species of conservation concern listed under the Convention of Migratory Species of Wild Animals, and/or bilateral agreements between Australia and Japan (JAMBA) and between Australia and China (CAMBA);
- sites adjacent to nesting beaches, feeding, resting or calving areas of species of special interest; for example, marine turtles and cetaceans;
- sites containing common species which represent a distributional limit and are of scientific value or which contains feeding, breeding, resting areas for populations of echidna, koala, platypus and other species of special cultural significance;
- sites containing high biodiversity that are of a suitable size or with connectivity to corridors/protected areas to ensure survival in the longer term; such land may contain:
  - natural vegetation in good condition or other habitat in good condition (e.g. wetlands); and/or
  - degraded vegetation or other habitats that still supports high levels of biodiversity or acts as an important corridor for maintaining high levels of biodiversity in the area;
- a site containing other special ecological values, for example, high habitat diversity and areas of high endemism;
- ecosystems which provide important ecological functions such as: wetlands of national, state and regional significance; coral reefs; riparian vegetation; important buffer to a protected area or important habitat corridor between areas;
- sites of palaeontologic significance such as fossil sites;
- sites of geomorphological significance;
- protected areas which have been proclaimed under the *Nature Conservation Act 1992* and *Marine Parks Act 1982* or are under consideration for proclamation; and/ or
- areas of major interest, or critical habitat declared under the *Nature Conservation Act 1992* or high nature conservation value areas or areas vulnerable to land degradation under the *Vegetation Management Act 1999*.

Specific issues to be addressed associated with aquatic ecology include:

- discuss the impact of the creation of permanent deep water within the marina and the likely colonisation of the marina and marine structures, which may partially offset the adverse impacts of the development on marine biodiversity;
- the potential increased threat of introduced marine pests from visiting cruise ships and small craft;
- potential impacts associated with dredging and dredge material disposal;
- benefits to recreational and/or commercial fishers resulting from provision of infrastructure or other aspects of the proposal;
- describe mitigation measures to reduce the impacts on turtles and dugongs related to increased recreational and commercial use (i.e. boat strike, degraded water quality);
- assess impacts on marine parks through increased marine traffic and visitation.

## 4.8 Cultural heritage

### 4.8.1 Description of environmental values

This section describes the existing cultural heritage values that may be affected by the proposal. Describe the environmental values of the cultural landscapes of the affected area in terms of the physical and cultural integrity of the landforms.

A cultural heritage study may be required that will describe Indigenous and non-indigenous cultural heritage sites and places, and their values. Any such 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;
  - 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 systematic survey of the proposed development area to locate and record Indigenous and non-indigenous cultural heritage places;
- significant assessment of any cultural heritage sites/places located;
- the impact of the proposed development on cultural heritage values;
- 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; and
- a permit to conduct the research and survey will be required under the provisions of the *Aboriginal Cultural Heritage Act* 2003 and/or the *Queensland Heritage Act 1992*.

### 4.8.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing cultural heritage environmental values, describes how nominated quantitative standards and indicators may be achieved for cultural heritage management, and how the achievement of the objectives will be monitored, audited and managed.

The environmental harm to cultural heritage values in the vicinity of the project should be managed under a cultural heritage management plan (CHMP) developed specifically for the project. The CHMP will provide a process for the management of cultural heritage places both identified and sub-surface at the project sites. It is usual practice for the CHMP to be based on information contained in archaeological and/or anthropological reports on the survey area and cultural reports and/or information from affiliated traditional owners. The CHMP should address and include the following:

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

The development of the CHMP should be negotiated with the lead agency, the Department of Natural Resources and Mines, and all stakeholder representatives, and where there is a role or responsibility identified for the Environmental Protection Agency, such as managing the EIS process under the EP Act, it should be party to the discussions.

Any collection of artefact material as part of a mitigation strategy will need to be done by an appropriately qualified cultural heritage practitioner holding a permit under provisions of the *Aboriginal Cultural Heritage Act 2003*. The EPA regional manager should be consulted for the provision of general advice including the appropriate conduct of cultural heritage surveys and the necessary permits.

Aspects of the above matters may be referred to the Land and Resources Tribunal and some may also involve native title considerations.

## 4.9 Social

### 4.9.1 Description of environmental values

This section describes the existing social values that may be affected by the proposal and should also include future social benefits resulting from the project.

The social amenity and use of the proposal area and adjacent areas for fishing, recreational, tourism, industrial or educational purposes should be described. Consideration should be given to:

- community infrastructure and services, access and mobility;
- 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, including, but not limited to: diving, fishing, surfing, boating and dog-walking;
- health and educational facilities;
- current property values;
- number of properties directly affected by the project; and
- number of families directly affected by the project.

Describe the social values for the affected area in terms of:

- the recreational amenity of the existing public access to the coast, parklands and tidal waterways within the project area;
- the integrity of social conditions, including amenity and liveability, harmony and well being, sense of community, and access to social and community services and infrastructure; and
- public health and safety.

Social, economic and cultural values are not as easily separated as physical and ecological values. Therefore it may be necessary for some material in this section to be cross-referenced with in section 4.8 Cultural Heritage and Section 4.11 Economy.

### 4.9.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing social values, describes 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 socio-economic environment, and describe the project's impact, both beneficial and adverse, on the local community. The impacts of the project on local and regional residents, community services and recreational activities are to be analysed and discussed for all stages of the development. The nature and extent of the community consultation program are to be described and a summary of the results incorporated in the EIS.

The social impact assessment should include sufficient data to enable State authorities, such as Queensland Health and Education Queensland, to plan for the continuing provision of public services in the region of the project. The summary should discuss how the impacts of population increase on public services, particularly health and education, would be mitigated.

The social impact assessment of the project is to be carried out in consultation with the Department of Communities. The assessment of impacts should describe the likely response of affected communities and identify possible beneficial and adverse impacts (both immediate and cumulative). These impacts should be considered both at the regional and local level.

Attention should be paid to:

- the loss of existing public access (including by recreational fishers) to coastal areas including the proposed site of the cruise terminal and the marina;
- the short-term, ongoing and cumulative impacts of interruption to navigation or other uses (eg swimming, surfing, fishing and diving) of waterways associated with dredging and navigation/security requirements for cruise ships;
- 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. This information is to be presented according to occupational groupings of the workforce;
- the impacts of both construction and operational workforces and associated contractors on housing demand, community services and community cohesion are 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;
- 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 in the area of the project;
- impacts on local residents' values and aspirations; and
- in regard to affected indigenous and non-indigenous communities respectively, particular attention should be paid to the effects on:
  - the ability of both indigenous and non-indigenous people, to live in accordance with their own values and priorities;
  - the use of and access to culturally important areas and landscapes;
  - the access to existing human and commercial services and housing;
  - the ability to participate in regional and local employment and training opportunities; and
  - the new project workforce and their families.

The effects of the proposal 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 operations phases of the development.

The potential environmental harm on the amenity of adjacent areas used for recreation, tourism, industry, education, aesthetics, or scientific or residential purposes should be discussed. The implications of the proposal for future developments in the local area including constraints on surrounding land uses should be described.

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

- primary, secondary and tertiary educational sectors;
- improved appreciation of conservation areas; and
- environmental education for the general public.

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.

## 4.10 Health and safety

### 4.10.1 Description of environmental values

This section describes the existing community values for public health and safety that may be affected by the proposal.

### 4.10.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting or enhancing health and safety community values, describes 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 EIS should assess the effects on the project workforce of occupational health and safety risks and the impacts on the community in terms of health, safety, and quality of life from project operations and emissions. Any impacts on 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.

Map(s) should be provided showing the locations of sensitive receptors, such as, but not limited to, kindergartens, schools, hospitals, aged care facilities, residential areas, and centres of work (e.g. Seaworld, hotels, office buildings, factories and workshops). The EIS, illustrated by the maps, should discuss how planned discharges from the project could impact on public health in the short and long term, and should include an assessment of the cumulative impacts on public health values caused by the proposal, either in isolation or by combination with other known existing or planned sources of contamination.

The EIS should address the project's potential for providing disease vectors. Measures to control mosquito and biting midge breeding should be described. Any use of recycled water should be assessed for its potential to cause infection by the transmission of bacteria and/or viruses by contact, dispersion of aerosols, and ingestion. Similarly, the use of recycled water should be assessed for its potential to cause harm to health via the food chain due to contaminants such as heavy metals and persistent organic chemicals.

Practical monitoring regimes should also be recommended in this section.

## 4.11 Economy

### 4.11.1 Description of environmental values

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

- existing housing market, particularly rental accommodation which may be available for the project workforce; and
- economic viability (including economic base and economic activity, future economic opportunities, current local and regional economic trends, in particular drought and rural downturn etc).

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

### 4.11.2 Potential impacts and mitigation measures

The function of 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 management, and how the achievement of the objectives will be monitored, audited and managed.

The effect on local and State labour markets should be discussed with regard to the source of the workforce. This information should be presented according to occupational groupings of the workforce. In relation to the source of the workforce, clarification is required as to whether the proponent or contractors, are likely to employ locally or through other means and whether there are initiatives for local employment opportunities. The impacts of both construction and operational workforces and associated contractors on housing demand should be addressed. The capability of the existing housing stock, particularly rental accommodation, to meet any additional demands created by the project should be discussed.

Any new skills and training to be introduced in relation to the project should be identified. Adequate provision should be made for apprenticeship and worker training schemes. If possible, the occupational skill groups required and potential skill shortages anticipated should be indicated.

An economic analysis, including a cost-benefit analysis, should be presented from national, state, regional and local perspectives as appropriate to the scale of the project. The general economic benefits from the project should be described.

At a level of detail appropriate to the scale of the project, the analysis is to consider:

- the significance of this proposal on the local and regional economic context;
- the short-term, ongoing and cumulative impacts of interruption to navigation or other uses (eg dive charters) of waterways associated with dredging and navigation/security requirements for cruise ships;
- the long and short-term beneficial (eg. job creation) and adverse (eg. competition with local small business) impacts that are likely to result from the development;
- the potential, if any, for direct equity investment in the project by local businesses or communities;
- the cost to all levels of government of any additional infrastructure provision;
- implications for future development in the locality (including constraints on surrounding land uses and existing industry);
- the distributional effects of the proposal including proposals to mitigate any negative impact on disadvantaged groups;
- the value of lost opportunities or gained opportunities for other economic activities anticipated in the future; and
- impacts on local property values.

Consideration of the impacts of the project in relation to energy self-sufficiency, security of supply and balance of payments benefits may be discussed. Attention should be directed to the long and short-term effects of the project on the land-use of the surrounding area and existing industries, regional income and employment and the state economy. The scope of any studies should be referred to the government for input before undertaking the studies.

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

## 4.12 Hazard and risk

### 4.12.1 Description of environmental values

This section describes the potential hazards and risk that may be associated with the proposal.

Detail the environmental values likely to be affected by any hazardous materials and actions incorporated in the proposal. The degree and sensitivity of risk should be detailed.

An analysis is to be conducted into the potential impacts of both natural and induced emergency situations and counter disaster and rescue procedures as a result of the proposal on sensitive areas and resources such as State and local Government controlled roads, places of residence and work, and recreational areas.

### 4.12.2 Potential impacts and mitigation measures

This section defines and describes the objectives and practical measures for protecting people and places from hazards and risk, describes how nominated quantitative standards and indicators may be achieved for hazard and risk management, and how the achievement of the objectives will be monitored, audited and managed.

The proponent should develop an integrated risk management plan for the whole of the life of the project including construction and operation phases. Attention must be paid to the emergency management

aspects of the cruise ship operations and security and navigation management requirements associated with movements of cruise ships and/or military vessels. Potential additional hazards of the project to recreational users in the area (eg diving, swimming, surfing and boating) must also be addressed.

### 4.13 Cross-reference with the terms of reference

This section provides a cross reference of the findings of the relevant sections of the EIS, where the potential impacts and mitigation measures associated with the project are described, with the corresponding sections of the ToR.

## 5 Environmental management plan

The environmental management plan (EM Plan) should be developed from the mitigation measures detailed in part 4 of the EIS. Its purpose is to set out the proponent's commitments to environmental management. That is, how environmental values will be protected and enhanced.

The EM Plan 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. The general contents of the EM Plan should comprise:

- the mechanisms for implementation of the EM Plan in association with the various phases of the development (construction etc) and the associated staging of the development of the timing of the staging, and ongoing management once the development is completed;
- the proponent's commitments to acceptable levels of environmental performance, including environmental objectives, i.e. levels of expected environmental harm, performance standards and associated measurable indicators, performance monitoring and reporting;
- impact prevention or mitigation actions to implement the commitments; and
- corrective actions to rectify any deviation from performance standards.

Through the EM Plan, the EIS's commitments to environmental performance can be used as regulatory controls through conditions to comply with those commitments. Therefore, the EM Plan is a relevant document for project approvals, environmental authorities and permits, and may be referenced by them.

For further information, see the EPA guideline **"Preparing environmental management plans"**.

## 6 Proponent's environmental record

Pursuant to the *State Development and Public Works Organisation Regulation 1999*, the proponent needs to provide details of any Australian proceedings relating to an environmental law against it. Information regarding any applicants for permits under an environmental law for the project must be supplied by the proponent. Furthermore, details of the proponent's environmental policy and planning framework must be incorporated into the EIS.

## 7 References

All references consulted should be presented in the EIS in a recognised format. Example references are in Attachment 1.

## 8 Recommended appendices

### A1. Final terms of reference for this EIS

A copy of the final ToR 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 ToR at least should be bound with the main body of the EIS for ease of cross-referencing. A summary, cross-referencing specific items of the ToR to the relevant section of the EIS, should also be provided in Section 4.13 of the EIS. For this purpose the ToR should be line numbered.

## A2. Development approvals

A list of the development approvals required by the project should be presented.

## A3. Study team

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

## A4. The standard criteria

A brief summary of the proposal's compatibility with ESD policy and other relevant policy instruments such as the standard criteria as defined by the Environmental Protection Act (Qld) should be presented. Consideration should focus on The National Strategy for Ecologically Sustainable Development, published by the Commonwealth Government in December 1992 (available from the Australian Government Publishing Service). Each principle should be discussed and conclusions drawn as to how the proposal conforms. A life-of-project perspective should be shown.

## A5. Consultation Report

The summary Consultation Report appendix for an EIS should commence by including the details of affected and interested persons, and the statement of planned consultation with those persons, originally provided with the draft terms of reference. It should describe how 'interested' and 'affected persons,' and any 'affected parties' as defined in the EPBC Act, were identified.

A further list should be provided that includes the Commonwealth, state and local government agencies consulted, and the individuals and groups of stakeholders consulted.

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

## A6. Specialist studies

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

- geology;
- soil survey and land suitability studies;
- waterway hydrology;
- groundwater;
- flora and fauna studies;
- economic studies, cost-benefit analysis; and
- hazard and risk studies.

## A7. Research

Any proposals for researching alternative environmental management strategies or for obtaining any further necessary information are to be outlined in an appendix.