Queensland Government
Department of Infrastructure

# Townsville Ocean Terminal Project

# TERMS OF REFERENCE
# FOR AN
# ENVIRONMENTAL IMPACT STATEMENT

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

**Department of Infrastructure**

March 2007

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## PREFACE

The Townsville Ocean Terminal 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 26 October 2006. 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 Federal, State and Local Government representatives and authorities to participate in the process as Advisory Agencies. The Advisory Agencies to the CG for the EIS process are:

- Department of Emergency Services
- Environmental Protection Agency
- Department of Health
- Department of Housing
- Department of Local Government, Planning, Sport and Recreation
- Department of Main Roads
- Department of Natural Resources and Water
- Department of Primary Industries and Fisheries
- Department of State Development, Trade and Employment
- Department of Tourism, Fair Trading and Wine Industry Development
- Department of Transport
- Queensland Police Service
- Townsville City Council
- Townsville Port Authority
- Department of Environment and Heritage

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.

The statutory impact assessment process under the *SDPWOA* is also the subject of a bilateral agreement between the Queensland and the Australian Governments in relation to environmental assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act).* The proponents referred the Project to the Commonwealth Minister for the Environment and Heritage in accordance with the provisions of the *EPBC Act*. The Commonwealth Minister decided, on 16 October 2006, that the Project did constitute a controlled action under Section 75 of the *EPBC Act*, with the controlling provisions being world heritage (sections 12 and 15A), wetlands of international importance (sections 16 and 17B), listed threatened species and communities (sections 18 and 18A), and listed migratory species (sections 20 and 20A).

However, it should be noted that the Commonwealth Minister will undertake a separate approval process following release of the CG's report. The Minister will 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 CG, 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 State has entered into a number of contractual arrangements that apply to the Project including the updated Breakwater Island Casino Agreement (BICA). In respect to the Project, BICA requires inter-alia:

- The establishment of a "Future Development Area Scheme" (FDA Scheme) that, subject to the Minister's approval, would take effect as a preliminary approval for the Project; and
- Townsville City Council to be assessment manager for all subsequent development approvals under the *Integrated Planning Act 1997*.

Application for approval of the FDA Scheme may be made after completion of the EIS for the project and its evaluation by the CG.

The Project involves development that would require subsequent applications 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, specify conditions that must attach to development approvals.

Further to the above *IPA* approvals, other approvals under a range of legislation including, but not limited to *Integrated Planning Act 1997, Environmental Protection Act 1994,* the *Coastal Protection and Management Act 1995, Fisheries Act 1994, Vegetation Management Act 1999* are likely to be required.

These ToR provide information in two broad categories:

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

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

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**** The term environment 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 proponent of the Townsville Ocean Terminal Project is a joint venture partnership between TABCORP and City Pacific Limited. TABCORP's direct involvement will not extend beyond the approvals process and the design and construction will be the full responsibility of City Pacific Limited. A contractual agreement for development of the site was formed between the proponent and the State of Queensland in March 2006.

## Project Description

The Townsville Ocean Terminal Project ('the Project') is proposed to be developed opposite the existing Port of Townsville and adjacent to the existing Townsville Hotel and Casino Complex and the Townsville Entertainment Centre. An Environmental Impact Statement (EIS) is required to identify potential benefits and adverse impacts on the social, economic and ecological environments associated with the proposed development.

The Project consists of the following key components:

- The cruise ship terminal, berthing pocket and associated facilities (the TOT precinct);
- Integrated residential waterfront development (Breakwater Cove precinct) and associated facilities; and
- Material extraction site(s) and transport routes.

The TOT precinct is proposed to be constructed within the Western Breakwater of the Port of Townsville and would provide dedicated berthing facilities for the cruise shipping industry and visiting navy ships. The Townsville Port Authority would own the TOT precinct and infrastructure on behalf of the State. Government is closely examining the option of the Port Authority also operating the TOT with non-core activities being contracted out.

The Breakwater Cove precinct is proposed to be constructed on reclaimed land to the west of the TOT precinct and would provide waterfront residential properties including attached and detached dwellings and apartment buildings.

Approximately 2,750,000 $m^3$ of fill material will be required for construction and would be sourced from extraction sites external to the Project area. Alternative locations for material extraction sites were identified in the Initial Advice Statement (IAS) and will be evaluated as part of the EIS. The preferred site for material extraction will be established following detailed site investigations.

The Project layouts currently proposed are based on preliminary concept engineering, material sourcing and construction methodology investigations. These have been undertaken to ensure that the Project has been defined sufficiently to allow the EIS studies to commence. There may be changes to the concept layouts as detailed engineering design is completed and other amenity, environmental and planning matters are taken into account.

## 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. The suitability of the site for the proposed development given the existing and future uses of adjacent sites and 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 must 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 scope of the EIS is to include the Project area, including the potential material extraction and dredge material disposal sites, for all aspects of investigations except in cases where the necessary development permits or licences are in place and will remain valid over the required time period(s).

The EIS process followed will be as specified in the *State Development and Public Works Organisation Act 1971* and 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 enhance benefits;
- to engage 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, Marine Parks Act 1982, Vegetation Management Act 1999, Nature Conservation Act 1992, Aboriginal and Cultural Heritage Act 2003, Transport Infrastructure Act 1994* and other legislation and the Townsville 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 surrounding land uses, transport networks and land use planning;

- impacts on infrastructure in the area including the road network, waste water treatment facilities, telecommunications and electricity networks;
- impacts on the coastal environment including water quality;
- impacts on areas of cultural heritage value and / or indigenous significance;
- air emissions and impacts;
- soil and geology issues.
- impacts of noise and vibration;
- economic effects, including impacts and benefits on the Port of Townsville and other local and regional businesses;
- impacts from adjoining land uses and how these impacts will be managed;
- social issues and opportunities;
- safety and emergency; and
- 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 was publicly notified in *The Townsville Bulletin, The Courier-Mail* and *The Australian* newspapers and the CG website inviting comment over the period from 18 November 2006 to 18 December 2006.

Thirteen responses were received from Government agencies and four responses were received from industry and business groups. All relevant comments have been incorporated into this document.

# 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 (ToR) 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 proponents, including details of any joint venture partners.

### 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 Project and a brief outline of the events leading up to the Project's formulation, including previous government decisions relating to the site, 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 including the subsequent evaluation of the EIS and approvals that may follow.

#### 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 a potential impact may or may not be significant, the proponent should take account of both the intensity of the impact and the context in which it could occur.**

Certain terms of reference will require the Proponent to seek relevant information from third parties, including Government agencies.

In such circumstances, the Proponent may rely upon the accuracy of such information as is provided to the extent reasonable to satisfy the objectives of the EIS.

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 topics for inclusion in 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 must provide opportunities for community involvement and education. It may include interviews with individuals, information sessions, key stakeholder briefings, 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 construction, ongoing operation and maintenance. Refer to the EPA guideline **"Issue Identification and Community Consultation"**.

## 1.6 Project approvals

### 1.6.1 Relevant legislation and policy requirements

This section should explain the legislation and policies controlling the approvals process including previous approvals, decisions or agreements that relate to the site. Reference should be made to the *Integrated Planning Act 1997* and other relevant Queensland laws particularly the *Environmental Protection Act 1994*, the *Coastal Protection and Management Act 1995* , *Fisheries Act 1994, and the Great Barrier Reef Marine Park Act 1975*. Any requirements of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* should also be included.

This section should also include a brief description of the history of the site.

The rights and responsibilities of the proponent in relation to the Project under the relevant provisions of the *Breakwater Island Casino Agreement Act 1984* (as amended) should also be described. This section should also describe the planning and approvals process specified in the Breakwater Island Casino Agreement and refer to the Future Development Area (FDA) Scheme and the FDA Port Protection code that will contain measures to be applied to development within the Breakwater Cove precinct.

Local Government planning controls, local laws and policies such as the City Port Strategic Plan (if available prior to publication of the EIS), the Townsville City Plan 2005 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. The list of development approvals must be provided as an appendix to the EIS and include any approvals required to be obtained for sourcing the fill material (see Appendix 2).

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

### 1.6.2 Planning processes and standards

This section should summarise 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) particularly the Townsville-Thuringowa Strategy Plan, and with legislation, standards, codes or guidelines available to monitor and control operations on site. This section should refer to all relevant State and regional planning policies. This information is required to demonstrate how the Project conforms with State, regional and local plans for the area.

## 1.7 Accredited process for controlled actions under Commonwealth legislation

This project is a controlled action under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC). In this regard, the Commonwealth has accredited 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 is necessary for the terms of reference to address potential impacts on the matters of National Environmental Significance (NES) that have been identified in the 'controlling provisions' when the project was declared a controlled action. In this case the NES matters are as follows:

- sections 12 and 15A (World Heritage)
- sections 16 and 17B (Wetlands of international importance)
- sections 18 and 18A (Listed threatened species and communities) and
- sections 20 and 20A (Listed migratory species)

The matters of NES to be specifically addressed under the requirements of the *EPBC Act* are, but should not be limited to:

- sections 12 and 15A
    - Great Barrier Reef World Heritage Area
- sections 16 and 17B
    - Bowling Green Bay Ramsar Site
- sections 18 and 18A
    - Humpback Whale (*Megaptera novaeangliae)*
    - Flatback Turtle (*Natator depressus*)
- Sections 20 and 20A
    - Dugong (*Dugong dugon*)
    - Humpback Whale (*Megaptera novaeangliae*)
    - Flatback Turtle (*Natator depressus*) and

A stand-alone report addressing the matters of NES must be provided as an appendix to the EIS (see Appendix 3) that exclusively and fully addresses the issues relevant to the controlling provisions. This stand alone section should include the following sub-sections:

***A description of the affected environment relevant to the matters protected***
It is important that the current status of the matters protected under the EPBC Act be described in sufficient detail, to inform the analysis of the Project's impact on these matters.

If the matters protected are the World Heritage values of a World Heritage property, the report should set out the World Heritage values that are potentially affected by the proposal within the wider context of the values of the property as a whole.

For wetlands of international importance, the description of the environment should set out the relevant ecological characters of the Ramsar wetland that are potentially affected by the proposal within the wider context of the values of the wetland as a whole.

For listed threatened and migratory species, the description of the environment should include:

- the species' current distribution;
- relevant information about the ecology of the species (habitat, feeding and breeding behaviour etc);
- information about any populations of the species or habitat for the species in the area affected by the proposed proposed action;
- current pressures on the species, especially those in the area to be affected by the proposal; and
- relevant controls or planning regimes already in place.

***Assessment of relevant impacts and mitigation measures***
In this section, the impacts and potential impacts on the matters protected should be described, and the possible mitigation measures for each impact need to be analysed. If alternative ways of taking the action have been identified, the relative impacts of these alternatives should also be considered.

When effective mitigation measures are not available, the discussion should be broadened to include compensatory measures to offset unavoidable impacts.

The discussion of impacts to the relevant matters protected should address all relevant impacts, and provide sufficient justification for all conclusions reached on specific impacts.

In some cases impacts may be relevant to more than one matter protected. For example when the species is listed as both a migratory and threatened species under the EPBC Act. In such cases the impacts may be addressed together, clearly stating the relevance of the impact to the different matters protected.

***Potential significant impacts on matters of National Environmental Significance (NES)***
The following potential impacts may need to be addressed in the EIS. The impacts are provided as a guide for specific matters of NES. Not all of these headings will apply to all proposals.

<u>Impact on the World Heritage values:</u>
- modify or inhibit ecological processes in a World Heritage property;
- reduce the diversity or modify the composition of plant and animal species in all or part of a World Heritage property;

- fragment, isolate or substantially damage habitat important for the conservation of biological diversity in a World Heritage property;
- cause a long-term reduction in rare, endemic or unique plant or animal populations or species in a World Heritage property;
- fragment, isolate or substantially damage habitat for rare, endemic or unique animal populations or species in a World Heritage property.

Impact on the values of wetlands of international importance:
- areas of the wetland being destroyed or substantially modified
- a substantial and measurable change in the hydrological regime of the wetland for example, a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland;
- the habitat or lifecycle of native species, including invertebrate fauna and fish species, dependant upon the wetland being seriously affected;
- a substantial and measurable change in the water quality of the wetland – for example, a substantial change in the level of salinity, pollutants, or nutrients in the wetland, or water temperature which may adversely impact on biodiversity, ecological integrity, social amenity or human health; or
- an invasive species that is harmful to the ecological character of the wetland being established (or an existing invasive species being spread) in the wetland.

Impact on a listed threatened species:
Potential impacts vary depending on whether the species is extinct in the wild, endangered or vulnerable but are generally as follows:
- lead to long term decrease in the size of a population;
- reduce the area of occupancy of the species;
- fragment an existing population into two or more populations;
- adversely affect habitat critical to the survival of the species;
- disrupt the breeding cycle of a population;
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- result in invasive species that are harmful to the species becoming established;
- introduce disease that may cause the species to decline; or
- interfere with the recovery of the species.

Impact on a listed migratory species:
- substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;
- result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or
- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

# 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.

An overall assessment of the need/demand for the various elements of the Project is required with regard to the following matters:

- the implications of the ocean terminal component of the Project for the Queensland Government's commitment to expanding Queensland's cruise shipping industry and its implementation of the Queensland Cruise Shipping Plan;
- potential benefits for the regional tourism industry;
- the direct commercial benefits for the adjacent casino and hotel and Townsville city retail outlets;

- potential benefits associated with visiting navy ships and personnel;
- the need for the proposed Breakwater Cove precinct against existing and proposed waterfront residential development in the region;
- need for the Project against existing and proposed marina facilities in the region;
- potential benefits for the regional marine industry;
- need for commercial and retail facilities as part of the Project;
- expected community, regional, state or national economic benefits (including anticipated capital expenditure, peak construction and operational jobs on a FTE (full time equivalent) basis);
- identify the anticipated social benefits for the Project in a "balance sheet" against any perceived social detriments; and
- other expected benefits.

## 2.2 Compatibility with the Port of Townsville

The EIS shall discuss the compatibility of the Project, particularly the proposed Breakwater Cove precinct, with existing and future operations associated with the Port of Townsville. The discussion must consider the future expansion and operations of the port to at least 2050 including potential capital works, dredging and consideration of growth in throughput over new and existing berths. The EIS must provide examples of similar residential developments located near industrial port facilities and discussion of their compatibility.

### 2.2.1 Emissions associated with port operations

Describe the potential for nuisance and amenity impacts within the proposed Breakwater Cove precinct associated with existing and future predicted emissions from the port. Baseline monitoring should be undertaken. It should take seasonality into account. The description of emissions should include:

- A discussion of the climatic conditions that may influence air quality, transmission of noise etc.
- A description of existing emission sources and potential capital works and operations in the port that may influence future emissions including port infrastructure, vessels, rail and road transport.
- A report on air quality (dust, fumes, particulates and odours - organic and inorganic) impacting on the Project site based on current and future port activities.
- A report on noise impacts on the Project site including existing operations, planned capital works, increased vessel and rail traffic, noise and vibration impacts of 24 hour dredging of the port.
- Impacts on the Breakwater Cove precinct from lighting associated with port operations.
- The potential for disturbance of residences and businesses from electromagnetic radiation associated with shipping.

### 2.2.2 Health and social impacts

Drawing on information developed in technical assessments, undertake an integrated health impact assessment of the proposed Breakwater Cove precinct to determine if the location of the residential development is appropriate considering the existing and proposed activities in the port area. Issues that should be considered include fire and explosions, noise, dust and air emissions and odours from mineral products, export of live cattle and other products.

Undertake an analysis of the risks and hazards to people and property in the TOT and Breakwater Cove precincts associated with cargoes and operations at adjacent berths in the port, as well as future development areas to be created within the port.

Describe the potential social impacts on future residents of the Breakwater Cove precinct from operations associated with the Port of Townsville. Include:

- A description of the likely demographics of the proposed Breakwater Cove precinct including residents and employees of businesses.
- The expected local community values, vitality and lifestyles.
- Implications (real and perceived) for public amenity associated with existing port operations and as a result of potential future expansion of the port.

### 2.2.3 Economic impacts

In consultation with the Townsville Port Authority describe the impacts of the Project on the future expansion and operations of the port to at least 2050 including:

- Potential limitations on future expansion of port facilities and other proposed capital works.
- Limitations on current or future operations that may arise from nuisance complaints and/or legal action including (but not limited to) dust, odour, noise, lighting, visual amenity, electromagnetic radiation/interference.
- The potential for higher environmental compliance costs for the Townsville Port Authority or port users as a result of the Project.

### 2.2.4 Mitigation

Discuss the Project's proposed mitigation measures designed to minimise impacts from port operations on future residents and businesses within the proposed Breakwater Cove precinct. The role of possible contractual, statutory and design mechanisms, including a Port Protection Code and Agreement, to manage potential nuisance complaints and/or legal action should be included.

Measures designed to avoid or minimise impacts from various emissions should also be considered and discussed including, but not limited to:

- The requirement for noise barriers within the TOT precinct and/or noise reduction design criteria of dwellings within the Breakwater Cove precinct should be determined to mitigate impacts arising from operations at the Port of Townsville. The EIS should recommend relevant internal and external noise criteria to be met by the development for incorporation in the FDA Port Protection Code.
- Feasible strategies for mitigation of air quality and lighting impacts including building design criteria, vegetated buffer zones etc.
- A discussion should be provided of timing schedules for construction and operations with respect to minimising environmental nuisance and harm from noise, dust and odour.
- Protection for the Townsville Port Authority or port users, such as commitments to cover future financial imposts caused by the development and for contractual covenants with purchasers to waive claims and objections.

## 2.3 Alternatives to the Project

This section should:

- Provide general information on any alternative locations or design options that were considered including the option of not proceeding with the development. Feasible alternative uses of the site should also be outlined including existing use (considering its value as tidal waters) and partial development/reclamation of the FDA;
- Discuss the suitability of the proposed land uses within the Breakwater Cove precinct and their vulnerability to impacts from existing and future likely adjoining land uses. Alternative configurations of the proposed residential components should be presented and discussed in this context including the option of medium density residential only (subject to security requirements for cruise/military vessels).
- Discuss the availability of appropriate alternative sites both within and external to the Port of Townsville. In addition, the feasibility of alternative designs of the TOT and Breakwater Cove precincts including to accommodate its use for broader community and commercial purposes;
- Discuss the options for dredge material disposal and reasons why sea disposal of dredge material would be required. Indicate any constraints to the different options for disposal.
- Describe the social, economic, ecological and technical criteria for selection of the preferred Project option;
- Provide sufficient detail to enable understanding of the reasons for selection of the preferred option and for rejection of alternatives
- Discuss the availability and feasibility of alternative fill materials and sources;
- Discuss the advantages and disadvantages of the various extraction sites and the reasons for choosing the preferred site over the other sites in terms of environmental impacts and feasibility.

Reasons for selecting the preferred options should include technical, commercial, social and natural environment aspects. In particular, the principals 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 Project 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 Project.

# 3 Description of the project

The objective of this section is to describe all phases of the Project throughout its lifetime including planning, construction stages, commissioning and long term operation of the facility. The Project description also allows further assessment of which approvals may be required and how they may be managed through the life of the Project.

The various elements of the project should be described in the text and illustrated with maps, diagrams, architectural plans (at a suitable scale) and artist's impressions, as required. Consideration should be given to providing a rectified air photo enlargement to illustrate components of the project in relation to the land and natural and built features of the area. The description should include, but may not be limited to:

- location of the Project site in relation to protected areas (e.g.Fish Habitat Areas and Great Barrier Reef Marine Park) and other sensitive areas (e.g. seagrass beds);
- Provide information and a map showing the existing approved and proposed dredge areas and dredge material disposal locations both during construction when the development is complete.
- Concept and layout plans for the TOT;
- Residential lots and infrastructure layouts within the Breakwater Cove precinct;
- Indicative location and layout of retail and commercial facilities;
- Location and layout of the marina precincts including layout, size and number of marina berths;
- Waterways and overland drainage pathways;
- Landscaping and open space areas;
- Vehicular and pedestrian access, carparking and traffic flows;
- Proposed excavation and fill areas and proposed haulage routes;
- Proposed construction sequencing and methodology.

## 3.1 Ecological Sustainable Development

A brief summary of the Project's compatibility with Ecological Sustainable Development 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 Project conforms. A life-of-project perspective should be shown.

This information is required to assess why the scope of the project 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 project.

## 3.2 Location

The location and real property description of a land within the Project area should be provided. Mapping should be prepared providing the site locality and illustrating boundaries of the Project area.

This section should describe the Project in the local and regional context.

## 3.3 Concept master plan

The updated Breakwater Island Casino Agreement (BICA) requires the establishment of a Future Development Area Scheme (FDA Scheme) that, subject to the Minister's approval, would take effect as a preliminary approval to override the planning scheme.

A proposed master plan for the site should be provided in the EIS with sufficient detail to describe the major elements of the FDA Scheme. The master plan should be presented and discussed in general terms to provide an understanding of the major Project elements and the services and facilities provided by the development.

The proposed master plan is to be devised in accordance with the *Breakwater Island Casino Agreement Act 1984* and must have regard to the following:

- The proposed City Port Strategic Plan
- The Townsville City Plan 2005 including but not limited to the following Codes;
    - District Code 1- Townsville Central City
    - Breakwater Precinct
    - Residential Codes
    - Works Code
    - Landscaping Code
    - Re-configuration Code
    - Parking and Access Code

Other aspects of the Planning Scheme will need to be considered including;

- Acid Sulphate Soils Overlay Code
- Waterways and Wetlands Overlay Code
- City Plan Policy Manual including Developer Contributions

Development of the Concept Master Plan should also consider the Townsville Port Authority Land Use Plan and should recognise through positive directives the significance of Townsville as a "Solar City" and its commitment to sound sustainable practices.

## 3.4 Construction

### 3.4.1 Construction methodology and sequencing

This section of the EIS should define the construction methodology and sequencing to be employed for the overall Project including the TOT and Breakwater Cove precincts and the material extraction site(s). This will include identifying:

- preferred construction methods and plant required at the Project site and extraction site(s);
- proposed material import and export arrangements including transport options, potential haul routes, schedule (including but not limited to vehicle/vessel types and frequency) and methods and materials stockpiles;
- construction traffic estimates including likely numbers of trips, haul routes and types of vehicle in accordance with Main Roads' *Guideline for Assessment of Road Impacts of Developments 2006*;
- hazardous materials that may be transported to or from the Project site during construction; and
- a preliminary programme for the design, delivery, construction and commissioning of the Project. This should state:
    - the anticipated construction period;
    - proposed working hours;
    - identification of potential construction areas;
    - the nature and timing of major tidal works;
    - parking facilities for construction workforce;
    - a schedule for construction and development to occur outside periods of high rainfall, therefore limiting the potential impacts associated with runoff.
- The estimated numbers of people to be employed in the project construction phase(s) with a description of where those people may be accommodated and/or how they will be transported to the site.
- Pollution control methods that will be used during construction and the measures that would be used to avoid or minimise impacts to the adjacent waterways.
- Temporary works associated with construction of the breakwaters and the TOT berth to ensure structural stability and safe operation of the port including contingency measures for tropical cyclone impacts.
- The measures that would be used to ensure safe navigation within the port and other waterways during all construction works.

- Where possible, sustainable engineering solutions to be considered where appropriate and provided these solutions concur with engineering best practice.
- Details of the proposed capital dredging and dredge material disposal including the amount of dredging required, the expected duration of works and the expected composition of dredged material. Provide details of the dredging methods including typical dredging plant, timing of dredging and dredge material disposal in terms of avoiding or minimising impacts on marine mammals, turtles and fish, including migrations and marine plant propagation.

Drawings indicating the type, location and extent of any tidal works or operational works on State land within a coastal management district (eg. reclamation, revetments, piles, pontoons etc) are required. Drawings should include levels of relevant tidal planes and adjacent land affected by the proposed works.

### 3.4.2 Construction of the TOT precinct

The site for construction of the TOT precinct should be:

- Described in detail including details of site access arrangements (including emergency vehicles), traffic management and service provision,
- The site should be described using detailed mapping of the Port and surrounding areas.
- The site location in relation to protected areas should be illustrated on maps and diagrams.

This section should also provide:

- A preliminary programme for the design, delivery, construction and commissioning of the TOT. This should state the period of construction and proposed construction hours.
- The dimensions and visual character of the proposed buildings and structures should be described in general terms. This should include concept drawings, perspectives and artists impressions of the facility.
- An indicative layout of all buildings and structures should be provided including details of the proposed modifications to existing port facilities and the western breakwater, navigational infrastructure and dredging to existing channels.

Illustrative plans should be provided in this section including:

- a layout plan showing indicative parking areas including access provisions and vehicle and pedestrian circulation paths;
- plans showing infrastructure servicing requirements and proposed provisioning arrangements including water, sewerage, electricity and telecommunications services;
- plans of hard and soft landscaping works including vegetation areas, buffer zones, street furniture and lighting in and around the Project area; and
- plans showing construction staging and staged commissioning Projects.

### 3.4.3 Construction of the Breakwater Cove precinct

The location for construction of the Breakwater Cove Precinct should:

- Be described in detail including detailed mapping of residential lots, road layouts and associated infrastructure.
- Illustrated with maps, diagrams, architectural plans and artists' impressions, as required.
- Be discussed and illustrated on maps and diagrams in relation to protected areas.
- Describe details of site access arrangements (including emergency vehicles), traffic management and service provision.

The dimensions and visual character of any proposed buildings and structures should be described in general terms. This should include:

- Concept drawings, perspectives and artists impressions of the residential area.
- Provide a preliminary programme for the design, delivery, construction and commissioning of the Breakwater Cove Precinct. This should state the period of construction and proposed construction hours.

Illustrative plans should be provided in this section including:

- An indicative layout of all residential lots and open space areas should be provided;
- A layout plan showing indicative parking areas including access provisions and vehicle and pedestrian circulation paths;
- Plans showing infrastructure servicing requirements and proposed provisioning arrangements including water, sewerage, electricity and telecommunications services;
- Plans of hard and soft landscaping Projects including vegetation areas, buffer zones, street furniture and lighting in and around the Project area; and

### 3.4.4 Material extraction and delivery

The location of the preferred material source sites in relation to protected areas should be discussed and illustrated on maps and diagrams.

The preferred material source site(s) should be described in detail, including:

- Details of the area to be impacted, volume and type of material to be excavated, extraction methodology and measures required to ensure that environmental impacts are mitigated and controlled.
- If relevant, include the depth of extraction below natural bed levels and measures to minimise the potential impact of extraction on sediment deposition patterns.
- Where alternative extraction sites have been considered, the EIS should discuss the methodology used and assessments carried out in selecting the preferred site.
- The current land uses of extraction sites including land tenure, native title and cultural heritage issues.
- Provide details of the grading and composition of materials including potential contaminants and/or indurated layers.
- Describe the proposed management of any contaminated fill material to ensure impacts on the resulting reclaimed areas are minimised.
- The existing environmental values including presence of flora and fauna species and likely impacts of the extraction process should be discussed.
- Where relevant, illustrative plans showing the Highest and Lowest Astronomical Tide levels and distribution of marine plants within and adjacent to the extraction site must also be provided.
- Proposed rehabilitation measures to be completed following extraction.

This section should also provide:

- A preliminary programme for the extraction process including commissioning, extraction and remediation of the site.
- A description of the proposed extraction methodology and environmental controls as well as details of the type and volume of material to be extracted including typical dredging plant, timing of works in terms of avoiding or minimising impacts on marine mammals, turtles and fish, including migrations and marine plant propagation.
- Describe all alternatives to the proposed methods of extraction and haulage.
- Details of the possible impacts on navigation from both exploration and extraction activity.
- A detailed haulage plan including, but not limited to proposed haulage routes, number and frequency of trips and type of vehicle/vessel.
- Details of the measures required during extraction operations to control silt plumes, dust and accidental spillage for inclusion in the EMP.
- Proposed remediation measures to be undertaken following completion of the extraction process.

Illustrative plans should be provided in this section including:

- Drawings and plans showing the extent of the extraction site, existing and proposed ground levels/water depths; and
- Access and transport arrangements via either road or ship movement of material including potential haul routes;

- If land based dredge material disposal is proposed, provide an assessment to demonstrate that the quality of the water discharged from dredge material disposal areas will meet standards necessary to achieve water quality objectives and therefore maintain receiving water environmental values.

The EIS should address long and short term impacts to the hydraulic performance of river or coastal systems where material is to be extracted from such an area.

Note that the above requirements do not apply to material source sites where the necessary development permits or licences are in place and will remain valid over the necessary time period(s).

## 3.5 Operations

The location and nature of the operations of the Project should be described in the text and illustrated with maps, diagrams and artist's impressions as required.

Detailed description is required of all operations that would be environmentally relevant activities as prescribed in the *Environmental Protection Act 1994*. Operational issues to be addressed shall include, but may not be limited to:

- a description of plant and equipment to be employed;
- the capacity of plant and equipment;
- the nature, sources, location and quantities of all chemicals to be handled on site;
- water use and the amount and characteristics of solid and liquid wastes produced and method of disposal;
- details of sewage disposal for vessels utilising the marina;
- details of emergency access provisions.

Details of the potential maintenance dredging of the artificial waterways and the navigation channel are to be provided including:

- Details of the proposed design dredging depths and the depths to be maintained, and detail how the maintained depths relate to the level of access for the range of vessels expected to use the TOT and Breakwater Cove precincts.
- Quantify the expected amount of maintenance dredging required, the expected frequency of maintenance dredging and the expected composition of dredged material.
- Provide details of the dredging methods including typical dredging plant, timing of maintenance dredging and dredge material disposal in terms of avoiding or minimising impacts on marine mammals, turtles and fish, including migrations and marine plant propagation.
- 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 arrangements to be put in place for long-term management of maintenance dredging operations including details of the party responsible for the long-term maintenance dredging operations and the proposed funding arrangements.
- Describe provisions for maintenance dredging in the event of a cyclone or other extreme conditions.
- Describe arrangements to be put in place for long-term (20 years) dredge material disposal including details of proposed material placement areas.
- If land-based dredge material disposal is proposed, provide an assessment to demonstrate that the quality of the water discharged from dredge material disposal areas will meet standards necessary to achieve water quality objectives and therefore maintain receiving water environmental values. Provide details of the long-term management arrangements of the dredge material disposal site.

Equivalent details of the potential maintenance dredging for the TOT facility are to be provided.

### 3.5.1 Operation of the Townsville Ocean Terminal precinct

This section should describe:

- Details of navigation, security, quarantine, buffer zones and other requirements associated with the operation of the terminal under both cruise ship and naval vessel arrival, departure and occupation.
- Mitigation measures to minimise impacts from the Townsville Ocean Terminal on the Breakwater Cove precinct.

- The operations of helicopters using the proposed helicopter landing pad including the likely operating constraints such as flight paths, allowable working hours, security considerations etc.

In conjunction with Queensland Transport,investigate the potential for use of the TOT facility for community and other commercial purposes that are complimentary to, or can cohabit with, its primary purpose as a cruise ship terminal. Such purposes could include, but not limited to, functions, entertainment and restaurants. Details of expected traffic that will be generated by each of these uses and the traffic impacts on the existing uses and road network must be provided. Details of how carparking will be arranged must also be provided.

### 3.5.2 Operation of the Breakwater Cove precinct

The arrangements for freehold ownership and any proposed body corporate or community management scheme should be identified for the Breakwater Cove Precinct. Operation of the Breakwater Cove precinct should be discussed:

- Outlining provisions and measures to ensure that access to and from the Project site is maintained and can function effectively at all times.
- Providing details of measures to ensure resident safety and security including street lighting.
- Describing drainage and waste treatment processes to ensure that water quality within the canal estate is maintained to acceptable levels.
- Providing proposed measures to ensure impacts from the adjoining TOT facility and the current and future operations of the port are mitigated and maintained within acceptable levels.
- Describing operations of the proposed marina facility including ownership, operational constraints and allocation of responsibilities.
- Describing maintenance provisions for all structures within the artificial waterways, including responsibility for maintenance works and monitoring requirements.

## 3.6 Rehabilitation and decommissioning

The EIS should describe:

- The options, strategies and methods for progressive and final rehabilitation of all environmental values disturbed by the Project.
- The strategic approach to progressive and final rehabilitation.
- A preferred rehabilitation strategy, developed with a view to minimising the amount of land disturbed at any one time.
- The final topography of the Project site and material extraction site(s), to be shown on plans at a suitable scale.
- The means of decommissioning the Project, in terms of the removal of plant, equipment, structures and buildings:
- the methods proposed for the stabilisation of affected areas.
- The process for decommissioning and rehabilitation of the material source extraction site(s), including any required removal of processing plant and infrastructure
- Decommissioning and rehabilitation of interim transport sites created to transport source materials including removal of plant and equipment, concrete footings and foundations, hardstand areas, storage tanks and wharfage (including any potential for reuse of these facilities).
- Options and methods for the disposal of wastes from the demolition of plant and buildings, in sufficient detail for their feasibility and suitability to be established.

## 3.7 Land Tenure

Maps at suitable scales should be provided showing the precise location of the project area (including access to the site), and in particular:

- the location and boundaries of land tenures, in place or proposed, to which the project area is or will be subject, including adjoining land tenure and/or legislative boundaries such as the Great Barrier Reef Marine Park boundary, the World Heritage area , port limits and roads;

- the location and boundaries of the project footprint showing all key aspects including excavations, stockpiles, areas of fill, crossings and built structures within waterways including all services infrastructure, plant locations, water storages, buildings, bridges, culverts, hardstands, car parks, etc;
- the location of any proposed buffers surrounding the working areas; and
- lands identified to be used for mitigation purposes, either through retention in their current natural state or to be rehabilitated.

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, Body Corporate Management and Conservation Covenants/Agreements, public use land or Reserves over the land and including a supporting plan, for the entire site and access to the site. Such details should include:

- The major stages and tenure applications required under the updated *Breakwater Island Casino Agreement* and timing for land tenure and future land uses within the project site, including the addressing of native title as required under the contractual agreement for the development of the site.
- The nature and structure of any future reconfigurations or the tiered body corporate arrangements to be established for the various components of the development, including:
    - the road system;
    - staging of the development;
    - the prevention of future pollution and pest incursion into waterways;
    - Port Protection measures; and
    - managing any nuisance issues arising from the surrounding land uses.
- The general terms to form part of the Body Corporate structure for the protection and maintenance of the open space areas within the Body Corporate land;
- A statement clearly defining the responsibility of Council or any other State Agency in on-going maintenance of either infrastructure established within the subject site including the proposed waterways (canals), breakwaters and any other revetments, or public use land or other public open space areas within the site. The statement should also include details of access to the areas, and financial arrangements for the ongoing management and maintenance of the areas.

# 4 Environmental values and management of impacts

The functions of this section are to include the following.

- To describe the existing environmental values of the area which may be affected by the Project. 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. Environmental values may also be derived following recognised procedures, such as described in the ANZECC 2000 guidelines and Queensland Water Quality Guidelines 2006. 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 Project on the identified environmental values. Any likely environmental harm on the environmental values should be described.
- To describe any cumulative impacts on environmental values caused by the Project, 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.
- 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 Project. Measures should minimise environmental harm and maximise socio-economic and environmental benefits of the Project. 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 Project 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 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, traffic and transport) 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 Project on the identified environmental values of the area. The expected cumulative impacts of the Project 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 Project and other proposals competing for use of the local air and water sheds.
- Where impacts from the Project 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 Project 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.
- Recommend control strategies for inclusion in the EMP 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 for the project (see section 5).

## 4.1 Climate

The existing local and regional meteorological environments and climate should be described including seasonal and diurnal variations. Ambient conditions should be described in sufficient detail to allow identification of elements that may influence the project. Climatic factors should include:

- Prevailing wind directions and strengths;
- Maximum, minimum and average rainfall and temperature;
- Relative humidity;
- Extremes of climate (rainfall, temperature, wind etc) should also be discussed with particular reference to water management at the Project site;

The vulnerability of the area to natural or induced hazards must be addressed, particularly tropical cyclones. Reference must be made to Bureau of Meteorology data on the frequency and strength of cyclones and any studies in relation to flooding and storm tide vulnerability. The relative frequency, magnitude and risk of these events should be considered along with a discussion of the potential impact of predicted climate change.

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 in Section 4.2. The impacts of storm events on the capacity of waste containment systems (e.g. site bunding/stormwater management) should be addressed with regard to contamination of waterways and with regard to the design of waste containment systems. The impacts of winds, rain, humidity and temperature inversions on air quality should be addressed.

## 4.2 Land

### 4.2.1 Description of environmental values

This section describes the existing environment values of the land area that may be affected by the Project. 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.

#### 4.2.1.1 Topography/geomorphology/bathymetry

Maps should be provided locating the Project in both regional and local contexts. 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 in Section 4.2. Commentary on the maps should be provided highlighting the significant topographical features, specifically

- The topography of the Project site and material source site(s) should be mapped showing contours at suitable increments and shown in relation to Australian Height Datum (AHD).
- The location of key tidal planes such as the Highest Astronomical Tide (HAT) and the Lowest Astronomical Tide (HAT) should be shown.
- Relevant coastal geomorphology should be characterised and supported by illustrative mapping.

#### 4.2.1.2 Geology

The EIS should provide a description, map and a series of cross-sections of the geology of the Project 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 Project should be described.

#### 4.2.1.3 Soils

A soils survey shall be undertaken within the Project area at a suitable scale to describe:

- The physical and chemical properties of surface and sub-surface materials and to determine the potential for soil erosion and the quality of stormwater runoff. Soil erosion potential and erosion rates should be described for each soil type identified.

- The stability of soils and suitability for the construction of proposed buildings and infrastructure should also be determined.

An investigation of the potential material extraction sites shall be undertaken by sediment sampling and analysis. The sediments at potential material extraction sites should be evaluated to determine the chemical and physical characteristics and suitability for use as fill material. The description of sediment characteristics must be sufficient for use in resuspension modelling, to determine whether the potential extraction material is suitable for use in construction of the TOT and Breakwater Cove precincts.

#### 4.2.1.4 Land use

Existing terrestrial land uses should be discussed in regard to both function and planning intent. Shipping and commercial uses of waterways should also be discussed. Such discussions should include:

- Description of the current land tenure and land use in the Project area; and
- Existing land use planning policy in terms of physical and economic attributes.

#### 4.2.1.5 Acid Sulfate Soils

An assessment of acid sulphate soils in accordance with the Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils (ASS) in Queensland 1998 (Revision 4.0 or any updates as they become available) should be carried out for all areas subject to excavation or filling below the level of 5 metres AHD where the Department of Natural Resources and Water (NR&W) cannot provide adequate mapping at a sampling frequency to be determined in consultation with NR&W and EPA, and for wetland areas where the natural hydrology (surface or groundwater) may be affected by the Project such that oxidation of potential ASS may occur.

#### 4.2.1.6 Contaminated Land

A search of the EPAs Environmental Management Register (EMR) and Contaminated Land Register (CLR) should be undertaken to determine the requirements for management under the *Environmental Protection Act 1994*. The history of the site should be investigated including analysis of historical aerial photographs and determination of past and current land uses.

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" (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.

#### 4.2.1.7 Sensitive environmental areas

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

In particular, the EIS should indicate if the land affected by the Project is, or is likely, to become part of the protected area estate, or is subject to any treaty. Consideration should be given to national parks, conservation parks, declared fish habitat areas, wilderness areas, aquatic reserves, heritage/historic areas or items, national estates, world heritage listings and sites covered by international treaties or agreements (e.g. Ramsar, JAMBA, CAMBA), areas of cultural significance and scientific reserves (see section 4.11 for further guidance on sensitive areas).

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

### 4.2.2 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.

#### 4.2.2.1 Land use suitability

Impacts and changes on existing terrestrial land uses should be discussed in regard to both function and planning intent. Changes in shipping and commercial uses of waterways should also be discussed. Such discussions should include:

- Description of the proposed new land use in the project area;

- An evaluation of the suitability of the project with land use planning policy in terms of physical and economic attributes;
- Compatibility of the project with surrounding land uses including identification of potential offsite activities that have the potential to cause an environmental nuisance at the proposed site and propose suitable mitigation measures to manage any potential environmental nuisances. This discussion must consider the future expansion of Port of Townsville, as described in relevant master planning documents.
- Possible impacts on surrounding land uses and human activities;
- Relationship to existing planning objectives and controls for study area;
- Consistency of the project with GBRMPA zoning of the affected areas.

#### 4.2.2.2 Soil erosion

Methods proposed to prevent or control erosion and sedimentation should be specified and should be developed with regard to:

- Preventing soil loss in order to maintain land capability/suitability.
- Preventing significant degradation of waterways by suspended solids, nutrients and other contaminants.

Mitigation strategies should be developed to achieve acceptable soil loss rates, levels of sediment in rainfall runoff and wind-generated dust concentrations. An erosion-monitoring program, including rehabilitation measures for erosion impacts identified during monitoring, should be outlined.

#### 4.2.2.3 Settlement

The EIS should detail measures required to control settlement of the site during the construction phase following commissioning of the Project. This should address the measures required to monitor settlements and likely residual settlements following commissioning. This section should detail requirements for future construction on the site to ensure residual settlements are catered for in building design and construction.

#### 4.2.2.4 Acid Sulphate Soils

The potential for acid generation by disturbance of acid sulphate soils during earthworks and construction should be discussed and measures for management of soils and mitigation of impacts should be:

- Proposed for all site earthworks and construction activities.
- Where required, management measures should be outlined in an Acid Sulphate Soils Management Plan prepared in accordance with QASSIT Guidelines and the requirements of SPP 2/02 in consultation with officers of NR&W and EPA.

#### 4.2.2.5 Contaminated Land

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:

- The proposed method of management and/or remediation of the site should be described.
- The means of preventing land contamination should be addressed in this section.
- The requirements for site management and the conditions under which the site can be used should be determined in consultation with the EPAs Contaminated Land Unit.
- Site management measures should be proposed to ensure that land contamination does not cause human health impacts or environmental harm.

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/. Proponents should refer study proposals to the EPA for review prior to commencement.

## 4.3 Traffic and transport

### 4.3.1.1 Existing transport infrastructure

The EIS should detail:

- The existing land-based transportation infrastructure potentially affected by the Project and extraction operations including road, rail, bridges, tracks and pathways.
- An analysis of existing local government and State-controlled road networks
- Details on the timing and scale of any proposed future upgrades to existing networks.
- Current standards of operation and performance indicators should be identified to allow an assessment of potential impacts to be undertaken.

The EIS should describe existing and future port and waterway transport that may be potentially affected by the Project, including:

- In consultation with the Townsville Port Authority, the existing Port of Townsville infrastructure and marine transport networks, including a description of the existing port traffic, frequency and types of vessels that currently use port infrastructure.
- Describe the predicted increased use of the port including potential new trades and the likely changes to vessel and rail traffic.
- Describe the existing non-port maritime infrastructure potentially affected by the Project and extraction operations including marinas, mooring areas, boat ramps, pontoons etc along with associated land-based infrastructure eg carparking and hardstand areas.
- Describe the existing non-port waterway traffic, frequency and types of vessels potentially affected by the Project and material extraction operations.

### 4.3.1.2 Potential impacts and mitigation measures – land based 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 expected volume, composition (types and quantities), origin and destination of goods to be moved including construction materials, plant, raw materials, wastes, hazardous materials, finished products;
- the volume of traffic generated by workforce personnel, visitors and service vehicles;
- 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); and
- the proposed transport routes including waterway crossings.

The EIS should:

- Identify impacts on the State-controlled and local government road networks and to indicate clearly the corrective measures necessary (including any modifications required to existing infrastructure) to address adverse road impacts and the costs involved. This will require:
    - Details of predicted increases in traffic as a result of the proposed development.
    - Comparison of the traffic and parking 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 Townsville City Council.
- Describe the requirements for provision of additional transport infrastructure.

- Provide details of the impact on any current or proposed rail infrastructure.
- Provide an assessment of the public transport requirements of the development in terms of existing transport networks and frequency of services and the requirement for provision of additional facilities within the development.
- Outline details of any potential impacts on existing or proposed pedestrian and cycle networks;
- The proposal would also need to consider existing and future public transport requirements and links to, or development of pedestrian and cycle networks
- Identify dedicated transport routes for construction vehicles and an assessment of the capacity of existing haul routes should be provided.
- Provide information on product spill contingency plans and the adequacy of equipment and facilities to deal with possible spills for the transport nodes of the Project.
- Assess and describe impacts on road infrastructure, road users and road safety. An analysis of the potential impact of construction and operational traffic generated by the Project should be undertaken including:
    - The impact on the road network generated by any interim or temporary road works (if any), necessary to service the initial stages of the Project and the likely timing of such works.
    - The impacts on traffic and transport associated with haulage of materials external to the Project area should be identified and a detailed haulage plan including, but not limited to proposed haulage routes, number and frequency of trips and type of vehicle of the projects is to be included.
    - The impact on stakeholders along all haulage routes (for example, noise and vibration) and how it will be managed;
    - Assessment of the existing pavement condition of affected roads and the potential for accelerated damage.
    - The impacts on agricultural operations or harvest.
    - Describe the potential impacts of the Project on stakeholders including residents of the Breakwater Cove Precinct and local residents;
    - An estimate of the peak traffic loads associated with existing uses, for example, the arrival or departure of a cruise ship; and
    - Clearly identify the corrective measures required to address adverse road impacts and an estimate of the costs involved. This will require comparison of traffic road conditions with, and without, the Project.
- Include a detailed analysis of probable impacts of construction and operational traffic generated by the Project with particular concern to impacts on parking, access, road infrastructure, road users, road safety and the need for increased road maintenance;
- Discuss access in and around the site by emergency vehicles (eg ambulance, fire and rescue) including potential congestion caused by construction traffic, access to the Strand breakwater and access to proposed bicycle and pedestrian paths; and
- Investigate the adequacy of the transport network to cope with any required emergency evacuation including the reliability of the single access to the TOT and Breakwater Cove precincts along Sir Leslie Thiess Drive. Any mitigating measures to provide acceptable levels of service including congestion and reliability in emergency situations should be identified.

The EIS must provide sufficient information of the impacts and proposed measures to make an independent assessment of how the State-controlled and local government road networks will be affected. The proponent must refer to the Department of Main Roads' "*Guidelines for the Assessment of Road Impacts of Development (2006)*" when assessing road impacts.

#### 4.3.1.3 Potential impacts and mitigation measures - marine transport

The EIS should describe impacts to marine transport that may be potentially affected by the Project, including:

- The expected increase in shipping traffic as a result of construction of the TOT.

- Provide information on ship movements and port requirements for both the construction and operational phases including berthing requirements during both construction and operation of the facility including any potential impacts on future port operations.
- Discuss timing within the overall construction program for the major marine works (including breaching of the existing breakwater wall) and any impacts on the operations of the port and non-port vessels from these activities.
- Outline any required modifications to existing port infrastructure including navigation markers and beacons.
- Describe the impact of the construction and operation activities of the Project on non-port waterway traffic including any expected increase in vessel movements. This should include vessels associated with, or temporarily affected by, material extraction activities.
- Discuss any potential impacts on the operation of the existing Volunteer Marine Rescue service in Ross Creek.
- Describe any constraints to navigation whilst military vessels are berthed (100m buffer around the vessel) and during berthing and departure of ships using the Ocean Terminal (subject to normal give way rules contained in the International Rules for the Prevention of Collision at Sea).
- Describe impacts on access to, and dedicated boating public usage of, the car-trailer parking area adjacent to the two Ross Creek public boat ramps by the construction and operation of the Project (including road traffic, hardstand areas, and workforce parking). Describe the measures to be put in place during project construction to minimise interference with vessel traffic to and from Ross Creek.
- Assess and address the siltation and erosion effects of the project on Ross Creek boat harbour infrastructure (public channels, rock walls, and boat ramps) caused by sediment disturbance and propeller wash from the manoeuvring of ships and tugs in the Ocean Terminal berth and its adjacent swing basin.
- Assess the potential of the project to increase the demand for public boat launching facilities (ramps and pontoons) in the Breakwater Cove precinct and surrounding areas of Townsville/Thuringowa. If relevant,, discuss options and the feasibility (including funding) of addressing an increased demand for public boat launching facilities either as part of the project or at an alternate location.
- Provide an assessment of the need for a public vessel landing in the Breakwater Cove precinct for the short term pick-up and set down of passengers, the depth required for its access channel, and the provision of public car parking associated with such a landing. If relevant, indicate the funding arrangements for ongoing operation and maintenance (including dredging) associated with such a landing.

The impact of increased shipping should be investigated, with consideration given to:

- Ship's waste;
- Ballast water;
- The introduction of exotic organisms attached to the hull of ships or released with ballast water including the measures that will be implemented to ensure no exotic species are released or become established in Townsville waters; and
- Impact on ship queuing in port.
- The potential for disturbance of nearby residences and businesses from increased electromagnetic radiation.

## 4.4 Non-transport infrastructure

### 4.4.1 Description of environmental values

The location and owner/custodians of all tenures, reserves, roads and road reserves, railways and rail reserves, stock routes and the like, covering the affected land should be shown on maps of a suitable scale. Indicate locations of gas and water pipelines, power lines and any other easements. All sub-surface infrastructure, proposed and current, is noted and included in a live "services plan" from developing stage onwards. Describe the environmental values affected by this infrastructure.

### 4.4.2 Potential impacts and mitigation measures

This section should provide descriptions, with concept and layout plans, of requirements for constructing, upgrading or relocating all non-transport infrastructure in the vicinity of the project area and how temporary works and temporary establishment, with respect to environmental aspects will be dealt with. The matters to be

considered include such infrastructure as power lines and other cables, wireless technology (e.g. microwave telecommunications), and pipelines for any services (whether underground or above).

#### 4.4.2.1 Energy

This section should describe and discuss all energy requirements of the Project, including:

- Electricity, natural gas and/or solid and liquid fuel requirements for the construction and operation of the Breakwater Cove Precinct and TOT should be described.
- The capacity of existing networks to service the development should be determined in consultation with service providers.
- The potential impacts on existing infrastructure should be assessed and details provided of upgrades required.
- The locations of any easements should be shown on the infrastructure plans.
- Energy conservation should be briefly described in the context of any Commonwealth, State and local government policies.

#### 4.4.2.2 Water supply and storage

Determination of potable water demand should be made for the Project, including the temporary demands during the construction period, demand from visiting cruise ships and other vessels and on-going demand from residential properties in the Breakwater Cove precinct. Details should be provided of any existing or upgraded town water supply required to meet such demands.

The EIS shall provide:

- Information on water usage by the Project, including the quality and quantity of all water supplied to the site. In particular, the proposed sources of water supply should be described (eg bores, any surface storages) and any approvals required under the *Water Act 2000*.
- Estimated rates of supply from each source (average and maximum rates) should be supplied.
- Any proposed water conservation and management measures should be described.
- Provide details of the likely internal recycled water supply requirements of the development.

#### 4.4.2.3 Stormwater drainage

This section should provide:

- A description and concept plan for the proposed stormwater drainage system and the proposed disposal arrangements, including treatment measures and proposed discharge points.
- A Stormwater Management Plan should be prepared for the site that addresses stormwater quantity and quality and the principles of water sensitive urban design. Water quality objectives for discharge of stormwater should be specified and stormwater quality improvement devices should be proposed to achieve the stated objectives.
- If new stormwater drainage systems are proposed to discharge to tidal waters: details of any development permits required to undertake operational work within the coastal management district and/or tidal work. If a development permit is required:
    - Information will need to be provided in accordance with EPA's guidelines Operational Work on State Coastal Land and/or Constructing Tidal Works.
    - It will be necessary to demonstrate that any discharge will not adversely affect the receiving environment.

#### 4.4.2.4 Sewerage

This section shall include:

- A description of the sewerage infrastructure required to service the Breakwater Cove Precinct and TOT including the location and capacity of sewage reception and handling facilities associated with the cruise ship terminal and associated vessels.

- An assessment of potential impacts on existing and planned sewerage infrastructure undertaken to determine the requirement for infrastructure upgrades as a result of the development including estimated costs.
- A discussion on contingency measures to be implemented when the capacity of existing sewage treatment systems are unable to cope with the load from the proposed development.
- Identification of any upgrading works required on the existing systems to accommodate the proposed development.
- Provide details of the internal sewerage requirements of the development.
- A description of the marine sewage pump-out/disposal facility (including long term operation and funding) to be made available to vessels using or berthed in the Breakwater Cove precinct.

#### 4.4.2.5 Telecommunications

The capacity of existing networks to service the proposed development of the TOT and Breakwater Cove Precinct should be determined in consultation with service providers. The requirement for provision of telecommunications infrastructure within the Project area should be determined. This section should also describe any impacts of the development on existing telecommunications infrastructure (such as optical cables, microwave towers, etc.) and identify the owners of that infrastructure.

#### 4.4.2.6 Other infrastructure

A description should be provided of any other developments directly related to the project not described in other sections, such as:

- fuel storage areas;
- equipment hardstand and maintenance areas;
- technical workshops and laboratories; and
- temporary accommodation, offices and storage.

### 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 Character and quantities of waste materials

Provide an inventory of all wastes to be generated by the Project during the construction, operational and decommissioning phases. 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 process wastes; and
- the volume and tonnage of any re-usable by-products.

Schematic diagrams, which for the operational phase may be simplified versions of those provided in section 3.4, should be provided for each distinct stage of the project (e.g. construction/site preparation, commissioning, operation and decommissioning) indicating the processes to be used and highlighting their associated waste streams (i.e. all waste outputs: solid, liquid and gaseous), including recycling efforts, such as stockpiling and reusing topsoil. The schematic diagrams, or an associated table, should cross-reference the relevant sections of the EIS where the potential impacts and mitigation measures associated with each waste stream are described.

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 and processing plant.

This information is required to enable the resource management agencies and other stakeholders to assess the efficiency of resource use, and allocation issues.

#### 4.5.1.1 Solid waste disposal

The proposed location, site suitability, dimensions and volume of any landfill, including its method of construction, should be shown.

#### 4.5.1.2 Liquid waste

A description should be presented of the origin, the expected quality and quantity of wastewater and any immiscible liquid waste originating from the project. Particular attention should be given to the capacity of wastes to generate acid, and saline or sodic wastewater. A water balance for the Project and processing plant is required to account for the estimated usage of water.

The EIS may need to consider the following effects:

- groundwater from excavations;
- rainfall directly onto disturbed surface areas;
- run-off from roads, plant areas, chemical storage areas;
- drainage (i.e. run-off plus any seepage or leakage);
- seepage from other waste storages;
- waste water usage from:
  - process use,
  - dust suppression, and
  - domestic purposes.
- evaporation;
- domestic sewage treatment - disposal of liquid effluent and sludge;
- water supply treatment plant - disposal of wastes; and
- potential reuse options.

### 4.5.2 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 4.5.1 and provide references to environmental values described in other sections of part 4 of the EIS.

### 4.5.3 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 and provide details of each waste in terms of:

- operational handling and fate of all wastes including storage;
- 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;
- measures to ensure stability of any dumps and impoundments should be described;
- methods to prevent, seepage and contamination of groundwater from any stockpiles and/or dumps should be given;
- market demand for recyclable waste (where appropriate) should be addressed; 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 Project. The EPA has also released draft guidelines covering aspects of waste management under this EPP, which should be addressed.

Waste minimisation and treatment, and the application of cleaner production techniques, should also be applied to gaseous wastes, particularly nitrogen oxides, sulfur oxides, particulates and carbon dioxide. Particular attention should be paid to measures, which will maximise energy efficiency and minimise internal energy consumption in the Project.

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

## 4.6 Water resources

### 4.6.1 Description of environmental values

This section should describe the existing environment for water resources, which may be affected by the Project and should identify all environmental values as defined by the *Environmental Protection Act 1994* and *Environmental Protection (Water) Policy 1997*.

#### 4.6.1.1 Surface waterways

An assessment of the surface watercourses and their quality and quantity in the area likely to be affected by the project should be undertaken with an outline of present and potential downstream water uses and the significance of these waters to the catchment system in which they occur (NB impacts on coastal water quality should be discussed in Section 4.7 (Coastal environment)). This should include a description of existing surface drainage patterns and flows and the likelihood of flooding.

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

- Values identified in the *Environmental Protection (Water) Policy*;
- Sustainability, including both quality and quantity;
- Physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form; and
- Any water resource plans, land and water management plans relevant to the affected catchment.

A monitoring program should be developed with sampling stations located upstream and downstream of the project area. A relevant range of physical, chemical and biological parameters should be measured to determine the potential environmental impact on any affected waterway.

#### 4.6.1.2 Groundwater

A groundwater survey should be undertaken to review the quality and quantity of groundwater in the project area, including groundwater use in neighbouring areas. This section should identify:

- Groundwater characteristics, recharge sources, direction of flow and existing levels across the project area and develop a groundwater monitoring program to be implemented both before and after commencement of operations.
- The data obtained from the groundwater survey should be sufficient to enable specification of the major ionic species present in the groundwater, pH, electrical conductivity and total dissolved solids.
- the environmental values of the underground waters of the affected area in terms of:
    - values identified in the *Environmental Protection (Water) Policy*;
    - sustainability, including both quality and quantity;
    - physical integrity, fluvial processes and morphology of groundwater resources; and
    - vulnerability to pollution.

### 4.6.2 Potential impacts and mitigation measures

This section of the EIS should describe the potential impact of the proposed development on environmental values for water resources as specified by the *Environmental Protection (Water) Policy 1997*.

Water management controls should be described for mitigating adverse impacts on surface and groundwater quality, quantity, drainage patterns and sediment movements.

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.

Conduct a risk assessment for uncontrolled emissions to water due to system or catastrophic failure, implications of such emissions for human health and natural ecosystems, and list strategies to prevent, minimise and contain impacts.

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

#### 4.6.2.1 Surface water and water courses

The potential environmental impacts on the flow and the quality of surface waters from all phases of the development should be discussed, with particular reference to their suitability for existing and future downstream uses. The assessment should determine the requirements of any affected riparian area, wetland, estuary, littoral zone, and any marine and in-stream biological uses.

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.

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

Having regard for the requirements of the Environmental Protection (Water) Policy, the EIS should present the methods to avoid stormwater contamination by raw materials, wastes or products and present the means of containing, recycling, reusing, treating and disposing of stormwater. Where no-release water systems are to be used, the fate of salts and particulates derived from intake water should be discussed.

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.

The hydrological impacts of the project (proposed extraction, reclamation and dredging activities and construction of breakwaters) should be assessed, particularly with regard to:

- Stream diversions;
- scouring and erosion,
- changes to flooding levels and frequencies both upstream and downstream of the Project.
- effects on mangrove and other estuarine habitats as a result of any temporary diversion of existing water courses.
- any potential impacts of material extraction on associated ecological processes or management of water resources in affected catchments by River trusts, riparian irrigators or other water management authorities.

This section should also address any potential impacts of changed hydrology on associated fresh groundwater uses.

The EIS should propose management methods to mitigate stormwater contamination by raw materials, wastes or products and present the means of containing, 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 to determine water quality objectives for the site.

#### 4.6.2.2 Groundwater

An assessment should be undertaken of the impact of the project on the local ground water regime caused by the altered porosity and permeability of any land disturbance. An assessment of the potential to contaminate groundwater resources and measures to prevent, mitigate and remediate such contamination should be discussed.

The EIS should define the extent of the area within which groundwater resources are likely to be affected by the proposed operations and the significance of the Project to groundwater depletion or recharge. The response of the groundwater resource to the progression and finally cessation of the project should be described.

## 4.7 Coastal environment

### 4.7.1 Description of environmental values

This section describes the existing coastal environment, which may be affected by the Project 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 defined 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*.

#### 4.7.1.1 Water quality

This section should:

- Provide information on water quality in the sea and estuaries below the limit of tidal influence, including nutrients, suspended solids, heavy metals, acidity, turbidity and oil in water.
- Identify the environmental values of the coastal seas of the project area including values identified by the Environmental Protection (Water) Policy and the State Coastal Management Plan.
- Detail the existing characteristics and condition of marine waters. Issues to be addressed include:
    - Description of surrounding marine waters in terms of physical, chemical and biological characteristics;
    - Identify potential sources and nature of pollutants to the marine environment;
    - Description of existing water quality; and
    - Effects of coastal processes including the currents, tides, storm surges, freshwater flows and pollutant migration on water quality.
- Provide a review of background turbidity levels and any historical water quality data including, if possible, a developed understanding of the extent of sediment plume migration.
- Provide a review of nutrient levels carried into the river(s) (where sand is to be extracted) via freshwater flows for comparison in relation to expected concentration levels and ecological significance associated with any dredged material. This assessment will also require the integration of the results of hydrodynamic and geomorphological studies.

#### 4.7.1.2 Coastal processes

This section should include:

- A review of data from previous relevant studies and an assessment of the validity of previous modelling based on monitoring data, especially in relation to movement of suspended sediments and sedimentation. The review should:

- Be supplemented, where necessary, by hydrodynamic and geomorphological modelling.
- Provide details of measured data collected for model calibration and verification, for a suitable coverage of the model, and comparisons provided between model results and data.

Reported data should include the following:

- Identifying sediment movement in relation to proposed channel and any sea or nearshore-based disposal area(s);
- Identifying sedimentation and turbidity as a result of dredging activities (and potential natural environment impacts);
- Investigations on the retention or otherwise of dredge material within the disposal area;
- Identification of the point source location, concentrations and movement of total phosphorous and nitrogen (nutrients) that may result from dredging or sea disposal of sediment;
- Assessment of the sedimentation rates and provision of details of the assessment method and/or comparison with historical sedimentation rates;
- Details of local and regional coastal processes including details of current (direction and velocity over a range of tide levels), waves, and potential sediment transport rates and directions for the study area and surrounding coastline; and
- Investigation of the geomorphodynamics of the area to provide an understanding of the past and present day coastal processes.

The relationship of these processes to marine flora and fauna and biological processes within the study area should also be discussed. Describe the environmental values of the coastal resources of the affected area(s) in terms of the physical integrity and morphology of landforms created or modified by coastal processes.

Provide baseline information on marine sediments and sediment quality in the area likely to be disturbed by dredging or vessel movements including contaminants (such as heavy metals, nutrients, pesticides), the presence of fines and/or indurated layers and acid sulfate potential. This information should be presented as a map of sediment types based on their physical and chemical properties and include depth profiles.

The relationship between currents, wave actions and extreme events (such as cyclones) and how they influence coastal processes should also be discussed. This discussion is to be based upon technical supporting information from previous studies and new investigations, where appropriate.

### 4.7.2 Potential impacts and mitigation measures

The EIS should assess the Project's consistency with the relevant policies of the *State Coastal Management Plan 2001* in the context of requirements of the *Breakwater Island Casino Agreement Act 1984*.

#### 4.7.2.1 Water Quality

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 Project on coastal resources and processes shall 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 and how predicted activities will meet these objectives (refer to the Environmental Protection (Water) Policy and the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000).
- Potential threats to the water quality and sediment quality within surrounding waters associated with the construction and operation of the facilities. This assessment shall consider, at minimum:
    - Method and timing of the extraction including treatment and haulage of excavated materials and tailwater.

- Dredging and dredge material disposal, including disturbance of layers of coffee rock, fine grained sediments and contaminated material with particular attention to: suspended solids, pH, dissolved oxygen, phosphorus and nitrogen.
- Potential accidental discharges of contaminants during construction and operation of the Project.
- Release of contaminants from marine structures and vessels, including antifouling coatings.
- Stormwater runoff from developed areas.
- The accumulation of nuisance/harmful algal blooms within the artificial waterways.
- Strategies to limit impacts to acceptable levels should be provided
- Potential impacts on adjacent fisheries habitats (i.e. seagrass beds).

- 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.

#### 4.7.2.2 Coastal Processes

The impacts of the proposed works on coastal processes within the study area should be described. In particular:

- The potential impacts of the proposed works on tidal hydrodynamics in the project area including changes to flow velocities and water levels.
- Impacts on sedimentation and any implications for marine flora and fauna and/or biological processes should be discussed, including generation and migration of turbidity plumes
- Sediment transport processes, including shoreline erosion and/or accretion.

The assessment should:

- Discuss the potential impacts associated with extreme events such as storm tide flooding. This must include an assessment of the vulnerability of the proposed development to storm tide flooding and the potential of the proposed works to affect vulnerability to storm tide flooding on adjacent properties. The potential effects of predicted sea level rise should also be considered.
- Discuss the performance of the proposed breakwater structures and entrance configuration, particularly in relation to extreme events. The discussion should include risk of failure, wave overtopping and wave penetration (both long waves and short waves).
- Describe the potential impacts associated with the frequency of maintenance dredging requirements and the long-term use of the proposed dredged material disposal area.
- Include strategies to deal with the long term sustainability of depositing material from maintenance dredging.
- Describe the extent of potential impacts resulting from changes to the coastal processes nearby to the proposed dredge material disposal location.
- Include data on identification of increased sedimentation, turbidity, changes in hydrology within and adjacent to the source fill extraction area and resulting from the proposed dredging activities.
- Detail the short and long term effects from potential changes to the local and regional wave climate, currents and sediment transport pathways. Include potential impacts from migration of dredge material from disposal area(s), particularly in relation to the Great Barrier Reef bioregions, and potential impacts on Magnetic Island, and regional coastline processes (e.g. The Strand, Bowling Green Bay, Cleveland Bay).
- This assessment should also discuss the potential impacts associated with extreme events.

## 4.8 Air

### 4.8.1 Description of environmental values

A description of the local air environment should be provided in this section. The EIS should:

- Identify existing and future sensitive receptors and identify the potential for nuisance and amenity impacts associated with air emissions from the proposed development including a description of existing emission sources and the climatic conditions that may influence air quality.
- Address both construction and operational phases of the development.

- Include:
    - Preparation of land use and terrain information for the area to enable prediction of air concentrations at ground level;
    - Review of existing air quality monitoring and meteorological data for the area.
    - Modelling of the area to establish the projected changes to atmospheric environment due to existing pollutant generators and the new facility.

A baseline monitoring program should be undertaken at the nearest sensitive receptors to determine ambient air quality. Appropriate air quality criteria should be proposed for suspended particulates and dust deposition during construction and operation of the Project.

#### 4.8.1.1 Greenhouse gas emissions

This section of the EIS should:

- provide an inventory of projected annual emissions for each relevant greenhouse gas, with total emissions expressed in 'CO2 equivalent' terms;
- estimate emissions from upstream activities associated with the proposed project, including fossil fuel based electricity consumed; and
- briefly describe method(s) by which estimates were made.

The Australian Greenhouse Office Factors and Methods Workbook (available via the internet) can be used as a reference source for emission estimates and supplemented by other sources where practicable and appropriate.

### 4.8.2 Potential impacts and mitigation measures

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

Describe in detail the expected quantity and quality of all air emissions (including particulates, fumes and odours) from the project during construction and operation. Particulate emissions include those that would be produced by transportation equipment (e.g. trucks, either by entrainment from the load or by passage on unsealed roads) or disturbed by wind action on stockpiles. Additional particulate and gaseous emissions include those released from cruise ships while in berth.

The objectives for air emissions should be stated in respect of relevant standards (ambient and ground level concentrations), relevant emission guidelines, and any relevant legislation, and the emissions modelled using a recognised atmospheric dispersion model. The potential for interaction between the emissions from the Project and emissions in the air shed from existing pollutant generators, and the likely environmental harm from any such interaction, should also be detailed.

The projected changes to the atmospheric environment due to existing pollutant generators and the Project should be compared with the national environmental protection measures (NEPM) for ambient air quality (1998), the National Health Medical Research Council (NHMRC) national guidelines (1985) for control of emissions from stationary sources, the Environmental Protection (Air) Policy (1998) and the *Environmental Protection Act 1994.*

Where appropriate, the predicted average ground level concentrations in nearby areas should be provided. These predictions should be made for both normal and expected maximum emission conditions and the worst case meteorological conditions should be identified and modelled where necessary. Ground level predictions should be made for the Project site and surrounding areas believed to be sensitive to the effects of predicted emissions. The techniques used to obtain the predictions should be referenced, and key assumptions and data sets explained. The assessment of the Project's impact, i.e. environmental harm, on air quality should consider at least the following matters:

- A review of construction activities likely to cause air emissions including material extraction, material transport, excavation and filling, site compounds and stockpiles, etc.;
- A review of operational impacts associated with increased road and river traffic emissions, cruise ships and other vessels docked in the dedicated berth and air quality issues associated with servicing the facility
- The human health risk associated with emissions from all hazardous or toxic pollutants should be assessed whether they are or are not covered by the National Environmental Protection Council (Ambient Air Quality) Measure or the Environmental Protection (Air) Policy 1998.

- Features of the Project designed to suppress or minimise emissions, including dusts and odours, should be detailed.
- The proposed levels of emissions of dust, fumes and odours should include emissions during typical and worse case conditions. Consideration should be given to the range of potential upset condition scenarios including the air emissions that may be generated as a result.
- Where there is no single atmospheric dispersion model that is able to handle the different atmospheric dispersion characteristics exhibited in the Project area (i.e. sea breezes, strong convection, terrain features, temperature inversions and pollutant re-circulation), a combination of acceptable models will need to be applied and referenced.
- The limitations and accuracy of the applied atmospheric dispersion models should be discussed. The air quality modelling results should be discussed in light of the limitations and accuracy of the applied models.
- Air quality predictions should be compared to the relevant goals in the National Environmental Protection Council (Ambient Air Quality) Measure and the Environmental Protection (Air) Policy 1998 goals.
- Estimation of projected emissions both with and without the project.
- Comparison of the modelling results with the existing environment and legislative and regulatory requirements for air quality.
- Presentation of the results of the assessment including maps of modelled emissions and predicted concentrations.

#### 4.8.2.1 Greenhouse gas abatement

This section of the EIS should propose and assess greenhouse gas abatement measures. It should include:

- a description of the proposed measures (alternatives and preferred) to avoid and/or minimise greenhouse gas emissions directly resulting from activities of the project, including such activities as transportation of products and consumables, and energy use by the project and maximising the use of renewable energy sources;
- an assessment of how the preferred measures minimise emissions and achieve energy efficiency,
- a description of any opportunities for further offsetting greenhouse gas emissions through indirect means.

Direct means of reducing greenhouse gas emissions could include such measures as:

- minimising clearing at the site (which also has imperatives besides reducing greenhouse gas emissions);
- integrating transport for the project with other local industries such that greenhouse gas emissions from are minimised;
- maximising the use of renewable energy sources.

The environmental management plan in the EIS should include a specific module to address greenhouse abatement. That module should include:

- commitments to the abatement of greenhouse gas emissions from the project with details of the intended objectives, measures and performance standards to avoid, minimise and control emissions,
- commitments to energy management, including undertaking periodic energy audits with a view to progressively improving energy efficiency;
- opportunities for offsetting greenhouse emissions, including, if appropriate, carbon sequestration and renewable energy uses; and
- commitments to monitor, audit and report on greenhouse emissions from all relevant activities and the success of offset measures.

## 4.9 Visual amenity and lighting

### 4.9.1 Description of environmental values

#### 4.9.1.1 Landscape character

This section should describe in general terms the existing character of the landscape that will be affected by the Project. 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.

#### 4.9.1.2 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.

An assessment should be made of the existing visual quality and landscape character of the project site and the surrounding area. This assessment should describe:

- Identification of elements within the Project and surrounding area that contribute to their image of the town/city as discussed in the local government planning scheme.
- Existing short and long distance views of the project area and should describe the visibility of the project from existing viewsheds, including assessment from private residences in the affected area.
- The visual impact at night, in particular, when a cruise ship or other large vessel is in port (in terms of safe navigation in and out of the port).
- Significant visual landmarks within the locality should be described including natural features, ridgelines and water views to determine existing visual amenity of the area.
- The character of the built environment should also be described in terms of scale, form, materials and colours.

### 4.9.2 Potential impacts and mitigation measures

#### 4.9.2.1 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.

#### 4.9.2.2 Visual amenity

An assessment should be made of the impacts of the Project on the existing visual quality and landscape character of the Project site and the surrounding area. This assessment should describe:

- Impacts on existing short and long distance views of the Project area.
- Changes in the visibility of the Project from existing viewsheds.
- Impacts on significant visual landmarks within the locality, including natural features, ridgelines and water views to determine existing visual amenity of the area.
- Changes in the character of the built environment in terms of scale, form, materials and colours.

Predicted changes in the visual character of the project site following development should be illustrated by photographic simulation.

This section should:

- Describe how the impacts of the project on the visual quality and landscape character of the site and the surrounding area are to be mitigated or avoided including impacts on existing land uses that contribute to the character of the local area.
- Provide an assessment of potential impacts on views from private residences, business/commercial areas, open space areas and major views from known vantage points including views from marine vessels.
- Determine visual sensitivity by assessment of the capacity of the project area to absorb visual changes without impacting on existing visual quality.

- Propose options for mitigation of visual impacts and provide details of measures adopted in design of the project including the use of colours and forms to ensure integration with existing environments and the use of landscaping vegetation as a visual screen.

#### 4.9.2.3 Lighting

The EIS should provide:

- Details on the lighting required for safety and security requirements;
- An assessment of the sensitivity of the receiving environment is to be provided including potential impacts on aquatic fauna (eg turtle hatching) and adjacent residents. The location and design of lighting should minimise light pollution and 'sky glow';
- Management plans of the lighting of the Project, during all stages, with particular reference to objectives to be achieved and management methods to be implemented to mitigate or avoid:
    - The visual impact at night;
    - Night operations/maintenance and effects of lighting on fauna and residents;
    - The potential impact of increased vehicular traffic;
    - Changed habitat conditions for nocturnal fauna and associated impacts; and
    - Impacts on the Breakwater Cove precinct from lighting associated with the TOT precinct and the adjacent land uses eg port, casino/hotel precinct.
    - Impacts of lighting associated with the Project on safe navigation.

## 4.10 Noise and vibration

### 4.10.1 Description of environmental values

This section describes the existing environment values that may be affected by noise and vibration from the Project and the port.

All existing and future sensitive receptors as defined by the Environmental Protection (Noise) Policy 1997 should be identified within the vicinity of the Project site and located on a map at a suitable scale. The existing environment should be described in terms of the existing noise and vibration sources, in particular the Port of Townsville facilities, and ambient noise and vibration levels. This section should:

- Include a description of adjacent land uses and noise-generating equipment and infrastructure, including transport infrastructure (vessels, rail and road transport) currently in use; and
- Identify noise monitoring to be undertaken at nearby sensitive receptors to determine background noise levels.
- In consultation with the Townsville Port Authority, consider future expansion of the port and the predicted increased use of the port.

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. Noise from existing facilities should be measured in sensitive places and used to assist the modelling of predicted noise levels for the Project. 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. Noise monitoring should be presented in the form of an acoustic report which should be attached to the EIS as an appendix.

### 4.10.2 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 sensitivity of all receptors both external, and internal, to the development should be discussed and performance indicators and standards should be nominated for each affected receptor. 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.

The EIS should give a clear commitment that blasting will not be required, or carry out a detailed risk assessment of potential impacts of blasting on marine fauna and particularly marine mammals based on using best available and proposed marine blasting technology.

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

The following issues should be considered in determining potential noise and vibration impacts of the Project and material extraction site(s) on surrounding areas:

- Noise and vibration as a result of construction and material extraction activities;
- The potential impact of noise from increased shipping and traffic (motorists); and
- The potential impacts of noise and vibration on marine mammals and the local community.

A literature review and risk assessment on noise impacts in relation to marine mammals should be undertaken including a review of previous noise assessments undertaken for the area. The review should concentrate on those species known to be active in the study area (particularly during the proposed periods of dredging and construction activity) and their sensitivity to the expected noise and vibration emission from the proposed activities. Should the risk assessment and the initial review of literature indicate the need for quantitative assessment, a detailed noise and vibration model should be prepared.

This section should:

- Identify potential impacts that may arise during the construction phase and outline the recommended noise control measures to be implemented.
- Specify noise criteria and objectives to be achieved and outline a program for monitoring of noise and vibration levels during construction activities.

The following issues should be considered in determining potential noise and vibration impacts of the Project during its operational phase:

- Potential noise contours should be prepared and mapped using a suitable acoustic model based on the proposed generation of noise associated with the operation of the TOT precinct, including operation of the proposed helicopter landing pad;
- Noise impacts due to increased vehicular traffic on surrounding sensitive places;
- The potential environmental harm due to noise and vibration on nearby sensitive places including nearby residences and offices;
- Proposed measures for mitigation of noise and vibration effects to mitigate potential impacts

## 4.11 Nature conservation

### 4.11.1 Description of environmental values

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

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 Project. 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 (e.g. see the draft Regional Nature Conservation Strategy for SE Qld 2001-2006). The description should include areas within the project site and the surrounding area identified on the relevant local government planning scheme overlay map.

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. The Project's 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 area to the Great Barrier Reef World Heritage Property.

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 all biological studies.

#### 4.11.1.1 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 occurrence of pest plants (weeds), particularly declared plants under the *Land Protection (Land and Stock Route Management) Act 2002* should also be identified and shown on a map at an appropriate scale.

Vegetation mapping should be provided for all relevant project sites. All relevant adjacent areas should be mapped to facilitate the assessment of the conservation values in terms of its connectivity and functioning with adjoining areas.

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 Regional Ecosystem Description Database [REDD] available at the EPA's website.
- 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.

A list of species present on the site and their abundance should be recorded. Methodology used for flora surveys and species lists should be specified in the appendices to the report.

### 4.11.1.2 Terrestrial fauna

The terrestrial fauna occurring within the Project area and in areas affected by material extraction should be described noting the broad distribution patterns in relation to vegetation, topography and substrate.

A field investigation should be undertaken and a description of the fauna present or likely to be present in the area should be provided including:

- information from fauna surveys covering both the wet and dry season and stratified by regional ecosystem
- 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 contain results from surveys for species listed as threatened or migratory under the EPBC Act.. Surveys should be conducted at the appropriate time of year when the species is likely to utilise the site, so that identification and location of these species is optimal. The EIS should indicate how well any affected communities are represented and protected elsewhere in the region.

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

### 4.11.1.3 Aquatic biology and fisheries

This section should provide a description of existing marine flora and fauna values and identify any conservation values within the Project area that may be impacted by construction of the TOT and Breakwater Cove precincts and activities required for material extraction.

This assessment should address at least the following:

- fish species, mammals, reptiles, amphibians, crustaceans and aquatic invertebrates occurring in the waterways within the affected area, and/or those in the associated marine environment;
- 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;
- Native and introduced marine flora and fauna;
- Marine ecosystems;
- Integrity of ecological processes;
- Habitats of significance, rare or threatened species; and
- Integrity of natural habitats.

Flora and fauna species and marine habitats within the study area should be defined through searches of the appropriate State and Commonwealth databases, review of previous studies and review of aerial photography, with field studies undertaken where inadequate information is available to sufficiently describe the marine communities for the purposes of the current impact assessment.

Specific issues to be highlighted include:

- Presence of turtles, dugong, whales, dolphins and other marine mammals within the Project area;
- Sea floor habitat and benthic macroinvertebrate communities in the vicinity of the Project area; and

- An assessment of the value of the marine habitats/ecosystems to fauna of conservation significance such as turtles (including Green Turtle, Leatherback Turtle and Hawksbill Turtle), dugongs, dolphins (including the Snubfin Dolphin and the IndoPacific Humpback Dolphin) and whales.
- 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 areas adjacent to the Project site;
- aquatic plants (including algal species);
- aquatic and benthic substrate; and
- habitat downstream of the project or potentially impacted by the Project.

Provide details of the commercial, recreational and indigenous fishing activities in the areas that have the potential to be impacted. Specific points to include:

- nature and extent of fish habitats, including seagrass (permanent and ephemeral seagrass meadows), macro-algae, mangrove and saltcouch communities and sand bars/mudflats, mapped relative to existing natural features for reference;
- types and spatial distribution of economically important fish species, including their migration requirements;
- nature, timing and spatial distribution of the respective fishing sectors;
- this section should also include provision for baseline data on marine plant communities, benthic communities and fisheries resources within and adjacent to the source fill extraction area.

### 4.11.2 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 *Marine Parks Act 1994, Nature Conservation Act 1992*, *Fisheries Act 1994* 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 particularly sensitive areas as listed below. 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 Great Barrier Reef Marine Park 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.

#### 4.11.2.1 Flora and fauna

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 any potential adverse impacts associated with the Project. Any potential net loss of ecological values should be described and justified.

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 authorities 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 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*.

#### 4.11.2.2 Aquatic ecology and fisheries

Specific issues to be addressed associated with aquatic ecology include:

- impacts on areas of nature conservation interest declared in the relevant Marine Park zoning plan(s) and Fish Habitat Areas declared under the *Fisheries Act 1994*;
- assessment of the impact of the proposed works on juvenile and adult aquatic species leading to loss of productivity in fish, crustaceans etc;

- describe any loss of seagrasses in relation to the extent and regional significance of seagrass communities and associated impact on fisheries, dugongs, turtles and dolphins etc;
- discuss the impacts on wetland values from works carried out as part of the project;
- discuss the impact of the creation of permanent deep water and the likely colonisation of the marina and marine structures;
- potential impacts associated with dredging and dredge material disposal;
- potential impacts associated with altered tidal conditions (water levels and flows) and degraded water quality (as determined from 4.7.2);
- 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);
- An assessment of the potential impacts on the marine flora and fauna within the Project area, in particular, increased sediment deposition resulting from construction and material extraction activities;
- A description of marine flora and fauna, which may be disturbed during construction, operation and maintenance of the TOT and Breakwater Cove precincts including any potential impacts associated with increased shipping.
- Proposed strategies to mitigate identified adverse impacts from the Project on aquatic flora and fauna for incorporation in the EMP. As required by clauses 74(5)(i) and (f) of the GBRMP Regulations 1983 the EIS should include:
    - Identification of the arrangements for making good any damage caused to the GBRMP by the Project; and
    - A description of the likely effects of the operational use of the Project on adjoining and adjacent areas and any possible effects of the proposed use on the environment and adequacy of safeguards for the environment.
- The immediate and longer term impacts on existing fish habitats, fish populations, migrations and sectoral fishing activities;
- Any benefits to the fishing sectors; and
- Measures to be employed to minimise the impacts on fisheries resources in and adjacent to the proposed development footprint both during and post construction.

Detail the potential environmental harm in the short term to flora and fauna communities from the direct effects of dredging. This should include modelling of the potential effects of the dredge plume (eg. increased turbidity) and re-suspension and seabed movement of dredge derived sediment on seagrass and other aquatic species within and adjacent to the proposed marina area.

Any offsets (mitigation) for impacts on fish habitats, fish and fisheries activities needs to be identified and quantified with regard to government policies, including the Department of Primary industries and Fisheries policy "Mitigation and compensation for activities causing marine fish habitat loss.

## 4.12 Cultural heritage

### *4.12.1 Description of environmental values*

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

#### 4.12.1.1 Indigenous Cultural Heritage

The *Aboriginal Cultural Heritage Act 2003* (ACHA) requires development in Queensland to take all reasonable and practical measures to prevent harm to Aboriginal cultural heritage. Searches should be conducted of State and Commonwealth cultural heritage databases and a description of registered cultural sites should be provided. Liaison should be undertaken with relevant Traditional Owners to identify places of cultural significance to those parties.

A systematic field survey of the site should be undertaken by a suitably qualified specialist to locate and record places and objects of cultural heritage significance that may not be recorded on existing databases. The field survey should involve participation by representatives of the relevant local Traditional Owners for the site.

A requirement of the ACHA is that a Cultural Heritage Management Plan (CHMP) is an essential element of any EIS. A CHMP should be prepared by a suitably qualified specialist for management of the site. This will involve:

- notification of the Chief Executive of DNRMW, the local government, and the registered Native Title claimants, who are the Aboriginal parties under the ACHA;
- endorsement of those Aboriginal parties who respond to the notification;
- consultation with the Aboriginal parties about their involvement in the EIS;
- preparation of a report by the Aboriginal parties and their advisors;
- seeking approval of the CHMP from the Chief Executive of DNRMW;
- compliance with the Duty of Care Guidelines and the CHMP Guidelines as gazetted;
- liaison with the Aboriginal Parties 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 search of both the Cultural Heritage register and the Cultural Heritage database;
- a systematic survey of the proposed development area to locate and record Indigenous cultural heritage places;
- significance assessment of any cultural heritage sites/places located;
- the impact of the proposed development on cultural heritage values; and
- a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and recommendations.

#### 4.12.1.2 Non-Indigenous Cultural Heritage

The cultural heritage study must be conducted by a suitably qualified expert and will require:

- a permit to conduct the research and survey will be required under the provisions of the Queensland *Heritage Act 1992*. The EPA regional manager should be consulted for the provision of general advice including the appropriate conduct of cultural heritage surveys and the necessary permit;
- a systematic survey of the proposed development area to locate and record non-Indigenous cultural heritage places;
- significance assessment of any cultural heritage sites/places located;
- the impact of the proposed development on cultural heritage values; and
- a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and recommendations.

### *4.12.2 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 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 Aboriginal/Torres Strait Islander people associated with the development areas in protection and management of Indigenous cultural heritage;

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

The development of the CHMP should be negotiated between the relevant parties i.e. the project proponent and the relevant Aboriginal party.

Any collection of artefact material as part of a mitigation strategy will need to be done by a suitably qualified expert as agreed between the relevant parties.

Some aspects of the above matters can be referred to the Land and Resources Tribunal. The Land and Resources Tribunal can provide mediation assistance in the course of developing a CHMP or make a recommendation of the suitability of the CHMP if the parties cannot reach agreement.

## 4.13 Social

### *4.13.1 Description of environmental values*

The EIS should identify and define (through a social profile) the local communities affected by the Project and their demographic characteristics.

The social amenity and use of the Project site and adjacent areas for rural, agricultural, forestry, fishing, recreational, industrial, educational or residential 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;
- health and educational facilities;
- current property values;
- number of properties directly affected by the project; and
- number of families directly affected by the project, this should include not only property owners but also families of workers either living on the property or workers where the property is their primary employment.

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

- the integrity of social conditions, including amenity and liveability, harmony and well being, sense of community, access to recreation, and access to social and community services and infrastructure; and
- public health and safety (refer to section 4.14).

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 4.12 Cultural Heritage and Section 4.15 Economy.

### *4.13.2 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, Queensland Police Service and Education Queensland, to plan for the continuing provision of public services in the region of the project. Proponents of projects that are likely to result in a significant increase in population of an area should consult the relevant management units of the State authorities, and summarise the results of the consultations in the EIS. The summary should discuss how the impacts of population increase on public services, particularly health and eduction, would be mitigated.

The social impact assessment of the project is to be carried out in consultation with the Department of Communities and the Townsville Population Health Unit. 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 interaction of the various proposed uses (eg residential, tourism, maritime) within the Project site and adjoining areas including the impacts on future residents of the Breakwater Cove precinct from operations within the TOT precinct and other surrounding land uses such as the Port of Townsville;
- Impacts on people who live, recreate, travel along, or work near the areas affected by the Project for both the construction and operation phases of the development;
- Impacts which may lead to any reduction to the amenity and sustainability of the local communities and in particular losses to community facilities and reduced accessibility;
- Community severance (if any) in relation to sense of place, identity and service delivery, for example schools, shops, churches, recreational, entertainment and cultural facilities, social links, health and other community centres and open space;
- The impacts on the community networks and quality of life;
- Accessibility for the disadvantaged, and for people with a disability;
- Personal safety and security at pedestrian paths and cycleways, including lighting, surveillance, access and emergency phones that may be developed as part of the Ocean Terminal;
- Housing and accommodation for construction and operation workforce;
- Recreational, leisure and sporting activities which may be affected, particularly relating to recreational fishing, boat users and public open space on The Strand;
- Potential influx of workers and impacts on the local community;
- Increased activity by interested groups;
- Impact of increased shipping frequency;
- Implications (real and perceived) for public amenity as a result of the development;
- Project modifications undertaken to improve social well being;
- Impacts associated with increased traffic loads (congestion, noise etc);
- 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 is to be addressed. If necessary, an accommodation management strategy should be developed. The capability of the existing housing stock, including rental accommodation, to meet any additional demands created by the project is to be discussed including;

- the size of the private rental market in the area, the vacancy rates of rental accommodation (including seasonal fluctuations) and median rents;
- the availability and median cost of housing for purchase in the area;
- constraints and opportunities for new housing construction in the area;
- 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 Project on local and regional residents, including land acquisition and relocation issues and property valuation and marketability, community services and recreational activities should be described for the construction and operations phases of the development.

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

## 4.14 Health and safety

### *4.14.1 Description of environmental values*

This section should:

- Describe the existing community values for public health and safety that may be affected by the Project including air, noise and traffic environments.
- Nearby and other potentially affected populations should be identified and described, with particular attention to those sections of the population, such as children and the elderly that are especially sensitive to environmental health factors.
- Provide map(s) showing the locations of sensitive receptors, such as, but not necessarily limited to, kindergartens, schools, hospitals, aged care facilities, residential areas, and centres of work (e.g. office buildings, factories and workshops).

### *4.14.2 Potential impacts and mitigation measures*

The EIS 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 Project, either in isolation or by combination with other known existing or planned sources of contamination.
- Define the objectives and practical measures for protecting or enhancing health and safety community values, including a description of 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.
- 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 and noise.

- Discuss policing and management of large groups of visitors to the TOT precinct including the need for additional police facilities.

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 (e.g. via use on food crops). 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.

## 4.15 Economy

### *4.15.1 Description of environmental values*

The general economic environment in which the Project will be constructed should be described, including:

- Current local and regional economic trends;
- Historical descriptions of large-scale developments and their effects in the region.
- Economic requirements and identified needs analysis for the various aspects of the Project;
- Existing cruise shipping, super yacht, marina, housing and property market at the local, regional and State level, including rental accommodation which may be available for the Project workforce;
- Details of economic activities within the area surrounding the Project site including the current and future activity of the Port of Townsville, commercial uses of other maritime infrastructure, tourism and recreational businesses.

### *4.15.2 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. 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

In general terms, the following implications of the Project, both positive and negative, must be investigated:

- Economic attributes and viability (including economic base and economic activity, future economic opportunities) of the Project on the local, regional and State level;
- Impacts on existing businesses, commercial premises and the property market during construction and post construction including the project's compliance with the relevant State policies that apply to the construction works eg. the Local Industry Policy;
- Opportunities for future businesses, commercial premises and the property market;
- The EIS must include information on measures to minimise or avoid adverse impact on commercial uses of the port and adjoining waterways of detriment to the existing users such as mining export, agriculture and fishing industries.

- The impact for vehicle and cyclist users in journey time savings, particularly in relation to the proposed Ross River Bridge connection;
- The direct and flow-on economic impact of the construction and operational stages of the Project in terms of its contribution to Gross Regional Product (value added), employment and income;
- The potential, if any, for direct equity investment in the Project by local businesses or communities;
- The cost to government of any additional infrastructure provision;
- Implications for future development in the locality;
- The potential economic impact of any major hazard identified in section 4.16;
- The distributional effects of the Project including projects to mitigate any negative impact on disadvantaged groups;
- The value of lost opportunities or gained opportunities for other economic activities anticipated in the future;
- Impacts on local property values; and
- Potential impacts on future regional development resulting from the proposed use of significant quantities of quarry materials (sand and rock)

For identified impacts to economic values, this section should define and describe the objectives and practical measures for mitigating any loss and protecting or enhancing economic values.

## 4.16 Hazard and risk

### *4.16.1 Description of environmental values*

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

Detail the environmental values both external, and internal, to the development likely to be affected by any hazardous materials and actions incorporated in the Project. 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 Project on sensitive areas and resources such as forests, water reserves, State and local Government controlled roads, places of residence and work, and recreational areas.

### *4.16.2 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.

An appropriate hazard and risk assessment must be undertaken to determine the level of risk associated with all social, economic and environmental issues associated with the construction activities that have been identified by studies and investigations undertaken for preparation of the EIS. The risk assessment will be conducted in accordance with AS/NZS Risk Management Standard 4360:1999 and will aim to identify the key issues to be addressed in the EIS and the level of mitigation required.

The hazard and risk assessment shall consider, but not be limited to consider:

- All relevant major hazards both technological and natural;
- Risks to public safety, the environment and property posed by impact of tropical cyclones (up to and including a category 5 event), particularly the effects of storm tide inundation;
- The risk of impacts on terrestrial and aquatic environments and significant ecological values;
- The risk of impacts on the socio-economic environments;
- Description of processes, type of the machinery and equipment used;
- All health and safety aspects of any work to which the proposed Project relates
- Hazards and risks associated with working in an operational port environment and close to local fishing areas;
- Hazards and risks associated with proposed helicopter operations;

- Impact to and from existing port operations including operation of existing major hazard facilities (as defined by the *Dangerous Goods Safety Management Act 2001*);
- All hazardous substances to be used, stored, processed or produced and the rate of usage;
- Hazards and risks associated with operation of the TOT facility including increased visitation of cruise ships and navy vessels;
- Arrangements for removal or decommissioning upon completion of construction or operation;
- Counter disaster and rescue procedures in the event of major natural hazards and other emergency situations (eg tropical cyclones, a major ship fire, an incident involving military vessels or a hazardous materials incident in the TOT precinct or the port);
- The possible frequency of potential hazards, accidents, spillages and abnormal events occurring during all stages of the Project;
- Indication of cumulative risk levels to surrounding land uses; and
- Licensing requirements and compliance with the relevant standards.
- Life of any identified hazards;
- Potential wildlife hazards such as crocodiles, snakes, and disease vectors; and
- Public liability of the State for private infrastructure (e.g. any electricity lines, water supply pipeline, telecommunication facilities, but not major infrastructure) and visitors on public land.

The plan should include the following components:

- operational hazard analysis;
- regular hazard audits;
- fire safety, emergency response plans;
- a flood hazard management plan in accordance with State Planning Policy 1/03 *Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*
- a section addressing the requirements of the State Coastal Management Plan policy 2.2.4 Coastal Hazards (see EPA guideline on *Mitigating the Adverse Impacts of Storm Tide)*;
- qualitative risk assessment; and
- construction safety.

The EIS should provide an inventory for each class of substances listed in the Australian Dangerous Goods Codes to be held on-site. This information should be presented by classes and should contain:

- chemical name;
- concentration in raw material chemicals;
- concentration in operation storage tank;
- U.N. number;
- packaging group;
- correct shipping name; and
- maximum inventory of each substance ;

Details should be provided of:

- safeguards proposed on the transport, storage, use, handling and on-site movement of the materials to be stored on-site;
- the capacity and standard of bunds to be provided around the storage tanks for classified dangerous goods and other goods likely to adversely impact upon the environment in the event of an accident; and
- the procedures to prevent spillages, and the emergency plans to manage hazardous situations.

## 4.17 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 proponents' 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. EM Plans are to be prepared for all aspects of the Project including construction and the operational phases of the TOT and Breakwater Cove precincts and the works associated with extraction and transport of fill materials. The general contents of the EM Plan should comprise:

- the proponents' 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;
- Environmental element - the environmental aspect requiring management consideration.
- Environmental values – the values identified during detailed investigations.
- Potential impacts – potential impacts identified during detailed investigations.
- Performance objective – the target or strategy to be achieved through management.
- Management actions – the actions to be undertaken to achieve the performance objective, including any necessary approvals, applications, and consultation.
- Performance indicators – criteria against which the implementation of the actions and the level of achievement of the performance objectives will be measured.
- Impact prevention or mitigation actions to implement the commitments;
- Monitoring – the intended monitoring program and the process of measuring actual performance.
- Responsibility – assign responsibility for carrying out each action to a relevant person/organisation.
- Reporting – the process and responsibility for reporting monitoring results.
- Corrective action – the action to be implemented in the case of non-compliance and the person/organisation responsible for action.

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 References

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

# 7 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. 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. Potential impacts on matters of National Environmental Significance

The EIS must provide a stand-alone report that exclusively and fully addresses the issues relevant to the matters of National Environmental Significance (NES) that were identified in the 'controlling provisions' when the Project was declared a controlled action under Part 3, Division 1 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). The report must provide:

- a description of proposed action (as it would impact on NES matters);
- a 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 Act); and
- an assessment of Impacts on NES Matters and Mitigation Measures.

## A4. Study team

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

## A5. Consultation Report

The summary Consultation Report appendix for an EIS under the EP Act 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;
- coastal processes, material extraction and dredging;
- waterway hydrology, including hydrodynamics and water quality;
- groundwater;
- flora and fauna studies;
- economic studies, CBA; and
- hazard and risk studies.

## A7. Research

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