Terms of reference for an environmental impact statement

Townsville Marine Precinct Project

Under Part 4 of the Queensland
State Development and Public Works Organisation Act 1971

The Coordinator-General
April 2009

Queensland the Smart State

Queensland Government
Department of Infrastructure and Planning

Contents

Contents **1**
Synopsis **4**
Abbreviations **5**
Part A: General information and administrative procedures **6**
1. Project background 6
2. Project summary 6
3. Project proponent 11
4. Legislative framework 11
5. EIS objectives 13
6. General EIS guidelines 13
7. Stakeholder consultation 15
8. EIS format 15
Part B: Contents of the EIS **17**
Executive summary **17**
Glossary of terms **17**
1.1 Project proponent 18
1.2 Project description 18
1.3 Need for the project 18
1.4 Relationships to other projects 18
1.5 Project need, costs and benefits 18
1.6 Alternatives to the project 18
1.7 The environmental impact assessment process 19
1.7.1 Methodology of the EIS 19
1.7.2 Objectives of the EIS 19
1.7.3 Submissions 20
1.8 Public consultation process 20
1.9 Project approvals 20
1.9.1 Relevant legislation and policy requirements 20
1.9.2 Planning processes and standards 21
1.9.3 Accredited process for controlled actions under Australian legislation 21
2. Description of the project **24**
2.1 Overview of project 24
2.2 Location 24
2.3 Construction 24
2.3.1 Pre-construction activities 25
2.3.2 Tidal works – dredging and reclamation 25
2.3.3 Structures 26
2.3.4 Commissioning 26
2.4 Operations 26
2.4.1 Rehabilitation 26
2.5 Associated infrastructure requirements 27
2.5.1 Workforce and accommodation 27
2.5.2 Transport 27
2.5.3 Energy 27
2.5.4 Water supply and storage 27
2.5.5 Stormwater drainage 28
2.5.6 Sewerage 28
2.5.7 Telecommunications 28
2.5.8 Waste management 28
3. Environmental values and management of impacts **29**
3.1 Land 30

3.1.1 Topography and geomorphology 31
3.1.2 Geology and soils 31
3.1.2.1 Description of environmental values 31
3.1.2.2 Potential impacts and mitigation measures 31
3.1.3 Land contamination 32
3.1.3.1 Description of environmental values 32
3.1.3.2 Potential impacts and mitigation measures 32
3.1.4 Land use 32
3.1.4.1 Description of environmental values 32
3.1.4.2 Potential impacts and mitigation measures 33
3.1.5 Landscape character and visual amenity 33
3.1.5.1 Scenic values 33
3.1.5.2 Landscape character 34
3.1.5.3 Lighting 34
3.2 Transport and infrastructure 34
3.2.1 Description of environmental values 34
3.2.2 Potential impacts and mitigation measures 35
3.3 Climate and natural disasters 36
3.3.1 Climate change adaptation 36
3.4 Surface waterways 37
3.4.1 Description of environmental values 37
3.4.2 Potential impacts and mitigation measures 37
3.5 Groundwater resources 38
3.5.1 Description of environmental values 38
3.5.2 Potential impacts and mitigation measures 38
3.6 Coastal environment 38
3.6.1 Hydrodynamics and sedimentation 38
3.6.1.1 Description of environmental values 38
3.6.1.2 Potential impacts and mitigation measures 39
3.7 Water quality 39
3.7.1 Description of environmental values 39
3.7.2 Potential Impacts and mitigation measures 39
3.7.3 Sediment quality and dredging 40
3.8 Nature conservation 41
3.8.1 Sensitive environmental areas 42
3.8.2 Terrestrial ecology 43
3.8.2.1 Description of environmental values 43
3.8.2.2 Potential impacts and mitigation measures 44
3.8.3 Aquatic ecology 46
3.8.3.1 Description of environmental values 46
3.8.3.2 Potential impacts and mitigation measures 48
3.9 Air quality 49
3.9.1 Description of environmental values 49
3.9.2 Potential impacts and mitigation measures 49
3.10 Noise and vibration 50
3.10.1 Description of environmental values 50
3.10.2 Potential impacts and mitigation measures 50
3.11 Waste management 51
3.11.1 Description of environmental values 51
3.11.2 Potential impacts and mitigation measures 51
3.12 Cultural heritage 51
3.12.1 Description of environmental values 51
3.12.2 Potential impacts and mitigation measures 52
3.13 Health and safety 52
3.13.1 Description of environmental values 52
3.13.2 Potential impacts and mitigation measures 52
3.14 Cumulative impacts 53

4. Social values and management of impacts 54
4.1 Description of existing social values 54
4.2 Potential impacts and mitigation measures 54
5. Impacts on state and local economies and management of those impacts 57
5.1 Description of existing economic character 57
5.2 Potential impacts and mitigation measures 57
6. Hazard and risk 59
6.1 Hazard and risk assessment 59
6.2 Emergency management plan 59
7. Matters of national environmental significance 61
7.1 Impacts on World Heritage Areas and National Heritage places 61
7.2 Wetlands of international importance 62
7.3 Impact on a listed threatened species and ecological communities 62
7.4 Impact on a listed migratory species 63
8. Environmental management plan 66
9. Conclusions and recommendations 68
10. References 68
11. Recommended appendices 68

Synopsis

The Port of Townsville Limited is the proponent for a commercial marine precinct project (known as the Townsville Marine Precinct Project) located at the mouth of the Ross River in the City of Townsville.

A marine precinct concept in the mouth of the Ross River has been mooted since the mid 1970s, with first concept drawings prepared in 1977. With increasing trade, commercial and residential growth in Townsville, strategic planning activities for the city have focussed on providing opportunities to relocate existing old commercial marine facilities spread around Ross Creek, Ross River and South Townsville into a new, purpose-built facility on Ross River that will incorporate current best practice environmental management.

The proposed project will require the reclamation of lands on Lot 773 on EP2211 (Benwell Road Beach—approximately 32 hectares (ha)). The proposal also incorporates the possible construction of a breakwater on the eastern side of the mouth of Ross River to protect the marine precinct from sediment infill and the action of waves (Figure 2).

The Coordinator-General has declared the project to be a 'significant project for which an environmental impact statement (EIS) is required' under Section 26(1)(a) of the *State Development and Public Works Organisation Act 1971 (Qld)* (SDPWO Act). The declaration does not indicate support for, or approval of, the project by the Coordinator-General or the Queensland Government; rather, it is a requirement for the project to undergo a rigorous EIS process.

The Department of Infrastructure and Planning (DIP) coordinates the EIS process on behalf of the Coordinator-General. The aim of the EIS process is to ensure that potential environmental, social and economic impacts of a proposed project, both direct and indirect, are examined and addressed.

The Australian Minister for the Environment, Heritage and the Arts has determined that the project constitutes a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)* (EPBC Act) due to possible impacts on matters of national environmental significance.

Terms of reference (TOR) set out the requirements, both general and specific, that the proponent should address in preparing an EIS for the evaluation by the Coordinator-General. These TOR have been released for public and advisory agency comment and are divided into two parts:

- Part A: General information and administrative procedures
- Part B: Contents of the EIS.

Abbreviations

The following abbreviations have been used in this document:

AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
CAMBA	China–Australia Migratory Birds Agreement
CG	Coordinator-General
CHMP	Cultural heritage management plan
CORVEG	Queensland Herbarium vegetation site database
DEEDI	Queensland Department of Employment, Economic Development and Innovation
DERM	Queensland Department of Environment and Resource Management
DIP	Queensland Department of Infrastructure and Planning
DTMR	Queensland Department of Transport and Main Roads
DPI&F	former Queensland Department of Primary Industries and Fisheries
EIS	Environmental impact statement
EMP	Environmental management plan
EPA	former Queensland Environmental Protection Agency
EP Act	*Environmental Protection Act 1994 (Qld)*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*
GBRWHA	Great Barrier Reef World Heritage Area
HERBRECS	Queensland Herbarium vegetation site database
IPA	*Integrated Planning Act 1997 (Qld)*
JAMBA	Japan–Australia Migratory Birds Agreement
MNES	Matters of national environmental significance (under the EPBC Act)
NOx	Oxide(s) of nitrogen
NRW	former Queensland Department of Natural Resources and Water
QASSMAC	Queensland Acid Sulfate Soils Management Advisory Committee
SDPWO Act	*State Development and Public Works Organisation Act 1971 (Qld)*
SOx	Oxide(s) of sulphur
The project	A new commercial and recreational marine precinct located at the mouth of the Ross River, in the City of Townsville.
The proponent	The Port of Townsville Limited (POTL)
TOR	Terms of reference

Part A: General information and administrative procedures

1. Project background

The Port of Townsville is situated between the mouths of the Ross River and Ross Creek in Cleveland Bay. Cleveland Bay is defined by Cape Pallarenda, Cape Cleveland and includes Magnetic Island. The proposed Townsville Marine Precinct Project will be situated at the mouth of Ross River (Figure 1).

With increasing trade and commercial and residential growth in Townsville, strategic planning activities for the city have focussed on providing opportunities to relocate existing old commercial marine facilities spread around Ross Creek, the Ross River and South Townsville into a new, purpose-built facility on Ross River that will incorporate current best practice environmental management.

A marine precinct concept in the mouth of the Ross River has been mooted since the mid 1970s. The first concept drawings were prepared in 1977. In 1991, the first environmental studies commenced to examine the potential impacts of developing a marine precinct in the eastern port area, with an environmental impact statement (EIS) being finalised in 1995. More recent strategic planning activities in Townsville (Port Development Plan, Townsville City-Port Strategic Plan, Port of Townsville Limited Draft Land Use Plan) focus on the port interface area and provide a coordinated vision for the provision of key infrastructure.

2. Project summary

The proposed project will require the reclamation of lands on Lot 773 on EP2211 (Benwell Road Beach—approximately 32 hectares). The proposal also incorporates the possible construction of a breakwater on the eastern side of the mouth of Ross River to protect the marine precinct from sediment infill and the action of waves (Figure 2).

The Port of Townsville Limited (POTL – the proponent) may justify capital investment in the proposed development on the basis that the following benefits could be derived:

- provision of a marine precinct sheltered from prevailing waves where commercial marine activities in Townsville can be consolidated
- provision of an area in Ross River for relocation of the existing trawler fleet which is required to occur prior to completion of the bridge linking the Townsville Port Access Corridor to Townsville Port
- restriction of westward longshore sediment transport into the navigation channel and subsequent reduction in the requirement to dredge in the longer term
- consideration of provision of mooring areas for vessels currently on buoy and pile moorings in the Ross River
- consideration of provision of recreational boat ramp facilities and parking.

The concept master plan for the proposed Townsville Marine Precinct Project incorporates onshore and offshore elements, which are listed below. A concept layout is depicted in Figure 2.

The two breakwater options represented in Figure 2 illustrate the estimated maximum and minimum configurations of any protective breakwater. Hydrological and sediment transport investigations during the EIS phase will assist in the location and configuration of a final breakwater design. The final breakwater design may fall somewhere between options 1 and 2 on Figure 2 and will endeavour to present the most efficient configuration, taking into account environmental disturbance, economic feasibility and wave protection for the facility.

Staging: Development works for the marine precinct may be completed in stages. For stage 1 it is anticipated that certain mandatory capabilities will be in place and operational by the time the bridge across the Ross River is completed (30 June 2011), so that disruption to functioning of current marine capabilities in Townsville is minimal. To that end, the Port of Townsville Limited will make available temporary hardstand space on the existing eastern reclaim area. Other stages will be developed over the following 5–10 years in accordance with market demand.

Permitted uses: The intended tenants of the marine precinct will be marine-related industries similar to those already in business in the Ross River and Ross Creek. It is expected that there will be opportunities for expansion of some business types and inclusion of new business types, provided they are marine-related and with approval of the Port of Townsville Limited. Residential development or hotel accommodation will not be permitted in the marine precinct.

Access to the precinct: Two dedicated access points will be provided from Benwell Road: one at the end of Boundary Street and one near the end of Archer Street. The final design of the access is still under negotiation with the Queensland Department of Transport and Main Roads (DTMR) in relation to the Port Access Road–Benwell Road interface.

Marine industry allotments: At a minimum, the Townsville Marine Precinct will provide the capability for replication of existing marine industries that may choose to relocate to the new facility. A commercial slipway, barge ramp, ship-lift, docking facility, work berths, chandlery and associated marine facilities are proposed. A rack and stack vessel storage system is being considered. It is anticipated that there will also be room for expansion of marine industries or for new marine-related industries to locate in the facility.

Trawler berths: Approximately 50 permanent trawler berths and two trawler maintenance berths are proposed for the marine precinct. The potential for temporary berths or loading/unloading berths for peak times is being considered.

Volunteer coastguard: Consideration will be given to relocation of the existing Townsville Coastguard office and mooring into this area.

Private pile moorings: Depending on final configuration, the inside of any breakwater could accommodate some pile moorings. The existing pile moorings upstream in the Ross River will most likely remain in place and be available for vessels able to motor underneath the proposed new bridge. Alternative mooring sites may be available in Ross Creek where other facilities are increasing their number of moorings.

Boat ramps and car/trailer parking bays: Consideration will be given to the provision of public boat ramps, pontoon landings and a car/trailer park area. A related study will also examine other possible locations for boat ramps in the local area.

Services: The full range of site services, including power, water, sewerage, stormwater drainage and telecommunications, will be provided to the proposed development. Due to evolving legislative changes to wastewater requirements in the Great Barrier Reef World Heritage Area, a sullage pump out facility may be required.

Breakwater: The estimated maximum and minimum configurations are illustrated in the concept layout (Figure 2). Hydrological, sediment transport and environmental investigations to be undertaken during the EIS phase will inform the design process and allow the best possible final configuration to be determined. Other options being examined with the aim of reducing potential environmental impacts include offshore configurations that do not connect to land. Although the 'no breakwater' option will be fully examined, it is considered that a breakwater is likely to be required to:

- provide shelter for the commercial marine area and pile moorings from prevailing wind and waves
- provide a sheltered swing basin for commercial vessels entering and leaving the facility
- provide a sheltered departure point to Cleveland Bay for smaller recreational boats

- restrict westward longshore sediment transport into the navigation channel and reduce the requirement to dredge the Ross River channel in the longer term
- provide an effective barrier between the common use areas and the sensitive environmental areas on the eastern side of the Ross River
- allow sand to accrete on the eastern side of the wall to provide an alternative migratory bird roosting and nesting area.

Breakwater options being considered are outlined below.

- No breakwater
- Option 1: Longer, more distant breakwater option
- Option 2: Shorter, closer breakwater option
- Other options: Other potential options being examined include smaller intermediate breakwater configurations that may not connect to land.

Dredging: The Port of Townsville Limited undertakes an approved program of maintenance dredging to maintain the navigability of channels within the port area, including the Ross River. The Ross River channel dredging program is sufficient to provide access for the commercial, defence and recreational vessels that currently use the Ross River. It is not anticipated that development of the project will increase the requirement for maintenance dredging.

Capital dredging will be required for the initial development of the project to obtain the necessary depth for vessel movements. Capital dredging would also be required to provide a swing basin and mooring area for any pile moorings adjacent to any breakwater. The depth and volume of dredge material will be determined by final design after further investigation during the EIS phase. Dredging will vary across the required areas (i.e. there may be a channel, swing basin and pile mooring area dredged initially). The requirement for further capital dredging could be driven by demand for marina berths and pile moorings.

It is anticipated that some dredge spoil will be used as reclaim fill for the project. The preferred method of dredging to reclaim would be to use a cutter suction dredge discharging through pipes directly into the reclamation area. Any material that is determined unsuitable as engineering fill may be extracted with an excavator rather than cutter suction dredge.

Offshore dumping may be considered for the disposal of unsuitable fill. The EIS will include a review of both onshore and offshore disposal options with the potential impacts of both options feeding into the considerations for the preferred breakwater configuration.

Vessel movements: Depending on the extent of recreational boating infrastructure constructed as part of the project, it is anticipated that the development of a marine precinct in the mouth of the Ross River will increase vessel numbers in the area within manageable proportions. The majority of industries being considered for co-location in the marine precinct (and their associated vessels) already exist either upstream of the proposed site in the Ross River or in Ross Creek. The Ross River channel is already a restricted speed zone. The EIS will investigate the potential for longer term changes in vessel numbers in the Ross River as a result of development of the project.

Figure 1 Project location

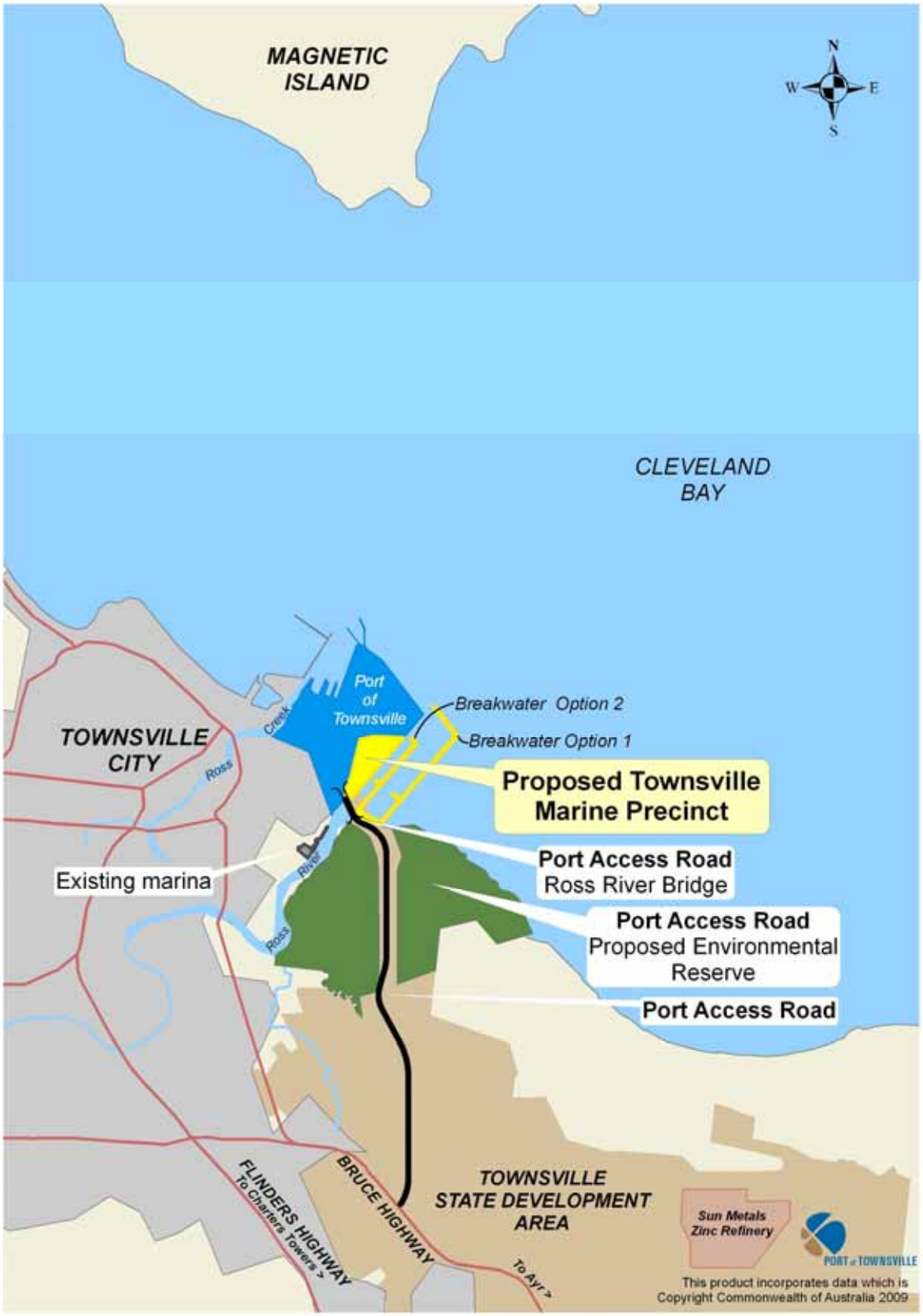
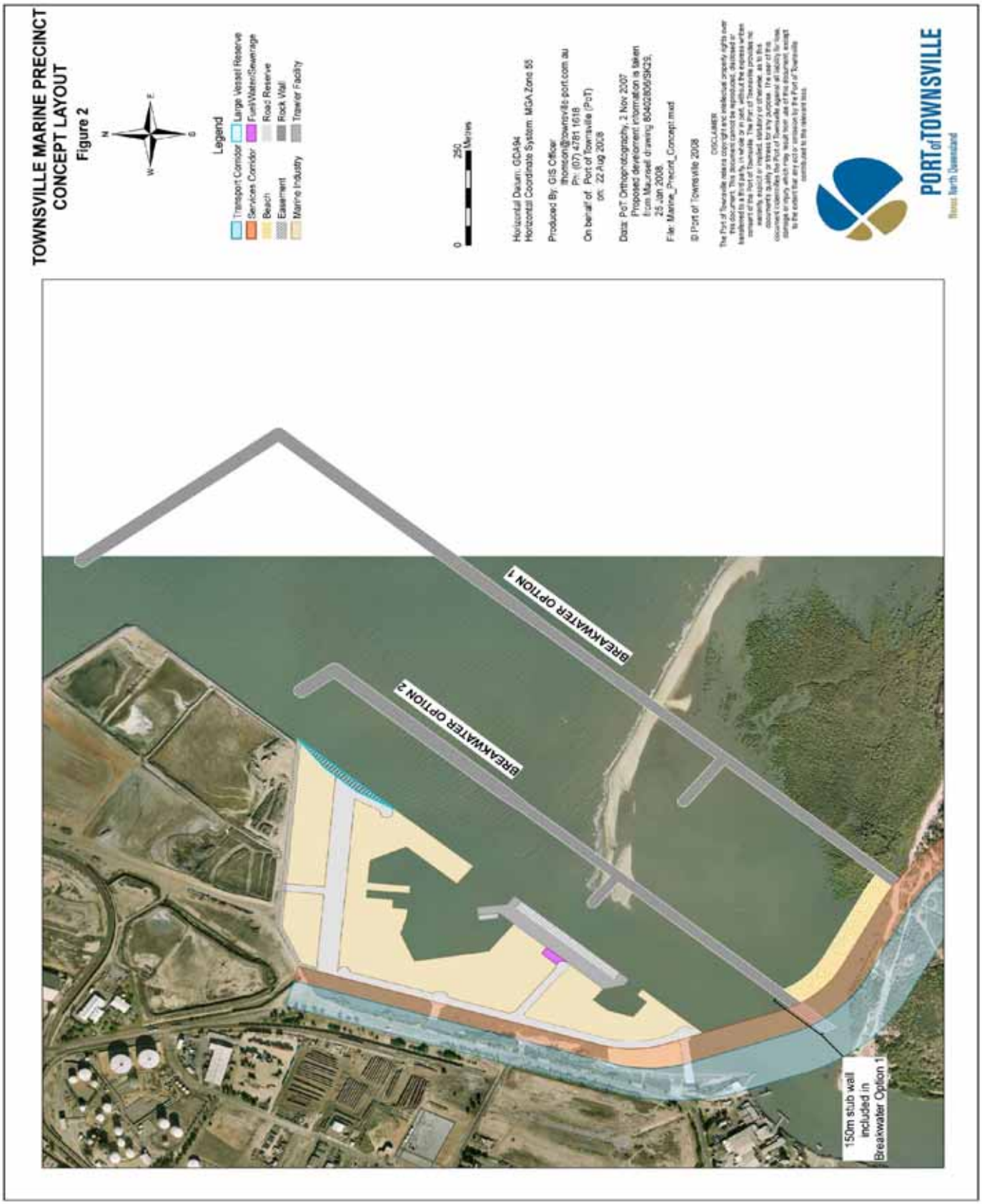


Figure 2 Concept layout



3. Project proponent

The Port of Townsville Limited is the proponent for a commercial marine precinct project, known as the Townsville Marine Precinct Project, which is located at the mouth of the Ross River. The Port of Townsville Limited is a government-owned corporation and a port authority under the *Transport Infrastructure Act 1994*. The Port of Townsville Limited is responsible for managing and developing the Port of Townsville.

4. Legislative framework

The Townsville Marine Precinct Project was declared by the Coordinator-General (CG) a 'significant project for which an environmental impact statement (EIS) is required' pursuant to Section 26(1)(a) of the *State Development and Public Works Organisation Act 1971 (Qld)* (SDPWO Act) on 22 August 2008. Matters considered by the CG in making this declaration included: information contained in an initial advice statement prepared by the proponent; relevant planning schemes and policy frameworks; infrastructure impacts; employment opportunities; environmental effects; complexity of local, state and Australian government requirements; level of investment; and the project's strategic significance. The TOR assists the proponent to develop a comprehensive EIS for the project satisfying the requirements of the SDPWO Act.

The Department of Infrastructure and Planning (DIP) is managing the EIS process on behalf of the CG. DIP has invited relevant Australian, state and local government representatives, and other relevant authorities, to participate in the process as advisory agencies.

On 7 October 2008, the proponent referred the project to the Australian Government Minister for the Environment, Heritage and the Arts for a determination as to whether the project would constitute a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)* (EPBC Act) (Referral No. 2008/4497). The EPBC Act establishes an Australian Government process for environmental assessment and approval of proposed actions that are likely to have a significant impact on 'matters of national environmental significance' or on Australian Government land.

On 3 November 2008, the Australian Government Minister for the Environment, Heritage and the Arts determined that the project is a controlled action and that the controlling provisions are:

- Sections 12 and 15A (World Heritage properties)
- Sections 15B and 15C (national heritage places)
- Sections 16 and 17B (wetlands of international importance)
- Sections 18 and 18A (listed threatened species and communities)
- Sections 20 and 20A (listed migratory species).

In accordance with the Commonwealth Minister's decision on the assessment approach, the project requires assessment and approval under the EPBC Act. The Australian Government has accredited the Queensland state EIS process, conducted under the SDPWO Act, under a bilateral agreement between the Australian and Queensland Governments. This will enable the EIS to meet the impact assessment requirements under both Australian and Queensland legislation. The project will require approval from the responsible Australian Minister under Part 9 of the EPBC Act before it can proceed.

Consequently, the term 'environmental impact statement' used in these TOR should be interpreted as satisfying the impact assessment requirements of all relevant Queensland and Australian Government statutes for this project (i.e. including, but not limited to, the SDPWO Act, the *Environment Protection Act 1994*, (EP Act) *Integrated Planning Act 1997* (IPA), *Transport Infrastructure Act 1994* and the EPBC Act).

The first step in the impact assessment process is the development of TOR for an EIS for the project. The process involves the formulation of draft TOR that are made available for public

and advisory agency comment. The draft TOR were made available for public and advisory agency comment on Saturday 22 November 2008, with submissions closing on Monday 22 December 2008. A total of 41 submissions on the draft TOR were received, including 16 from advisory agencies and 25 from members of the public and organisations.

In finalising the TOR, the CG has considered all properly made submissions and other submissions and information. The TOR has been presented to the proponent, who will prepare an EIS to address the TOR. Once the EIS has been prepared to the satisfaction of the CG, a public notice will be advertised in relevant newspapers circulating in the region and nationally. The notice will state where copies of the EIS can be viewed or purchased, the submission period, and where submissions should be sent. The proponent may also be required to prepare a supplementary report to the EIS to address specific matters raised during the EIS submission period.

At the completion of the EIS phase, the CG will prepare a report (CG report) evaluating the EIS and other relevant material, pursuant to s35 of the SDPWO Act . The CG report will include an assessment and conclusion about the environmental effects of the project and any associated mitigation measures. Material that will be assessed includes: the EIS; properly made submissions and other submissions accepted by the CG; and any other material the CG considers relevant to the project such as a supplementary EIS, comments and advice from advisory agencies and other entities, technical reports and legal advice.

The CG report will be publicly notified by placing it on the DIP website at www.dip.qld.gov.au. The CG report will also be presented to the proponent, the IPA assessment manager and the Australian Government Minister for the Environment, Heritage and the Arts.

If the project involves development requiring an application for a development approval under IPA, the CG report may, under s39 of the SDPWO Act, state for the assessment manager one or more of the following:

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

Alternatively the CG report must state for the assessment manager:

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

A separate development approval process will be undertaken under the EPBC Act.

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

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5. EIS objectives

The objective of the EIS is to ensure that all potential environmental, social and economic impacts of the project are identified and assessed and, where possible, how any adverse impacts would be avoided or mitigated. Direct, indirect and cumulative impacts must be fully examined and addressed. The project should be based on sound environmental protection and management criteria.

The EIS should be a self-contained and comprehensive document that provides sufficient information for an informed decision on the potential impacts of the project and the management measures employed to mitigate adverse impacts. The EIS document should provide information for the following persons and groups, as the project stakeholders:

- **for interested persons and bodies:** a basis for understanding the project, prudent and feasible alternatives, affected environmental values, potential impacts that may occur and measures to be taken to mitigate potential adverse impacts
- **for groups or persons with rights or interests in the land:** an outline of the potential effects of the project on that land including access arrangements
- **for government agencies:** a framework for decision-makers to assess the environmental aspects of the project with respect to legislative and policy provisions and based on that information to make an informed decision on whether the project should proceed or not and if so, on what conditions, if any
- **for the Australian Minister for the Environment, Heritage and the Arts:** information to determine the extent of potential impacts of the project on matters of national environmental significance, in particular the controlling provisions under the EPBC Act: sections 12 and 15A (World Heritage properties), sections 15B and 15C (national heritage places), 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)
- **for the proponent:** a mechanism by which the potential environmental impacts of the project are identified and understood. Information to support the development of management measures includes an environmental management plan, to mitigate the adverse effects of residual environmental impacts of the development.

The proponent is required to address these TOR to the satisfaction of the CG before the EIS is made publicly available. It should be noted that the CG does not evaluate the EIS until public notification is completed and the CG has obtained any other material the CG considers relevant to the project, including additional information or comment about the EIS and the project from the proponent.

6. General EIS guidelines

The EIS is to provide stakeholders with sufficient information to understand the type and nature of the project, the potential environmental, social and economic impacts, and the measures proposed by the proponent to mitigate all adverse impacts on the natural, built and social environment. It should be recognised that the Queensland Government and local governments, special interest groups and the general public will have an interest in the EIS.

All phases of the project should be described in the EIS including pre-construction, construction, operation and maintenance of all project-related sites and any redundant infrastructure or upstream lands. Direct, indirect and cumulative impacts should be identified and assessed with respect to the environmental values of the project area and its potential area of impact.

Cumulative impacts include impacts accumulating over time and impacts exacerbated by intensity or scale or frequency or duration of impacts both at the site and remote to the site.

Specifically, the EIS should provide the items listed below:

- an executive summary of the potential environmental impacts of the project

- an overview of the proponent and its operations
- a description of the project's objectives and rationale, as well as its relationship to strategic policies and plans
- a description of the entire project, including associated infrastructure requirements
- a description of feasible alternatives capable of substantially meeting the project's objectives
- an outline of the various approvals required for the project to proceed
- descriptions of the existing environment, particularly where this is relevant to the assessment of impacts
- measures for avoiding, minimising, managing and monitoring residual impacts, including a statement of commitment to implement the measures
- rigorous assessment of the residual risks of environmental impacts arising from the project and relevant alternatives on environmental, social and economic values, relative to the 'no project' scenario. The extent of baseline and predictive studies should be commensurate to risks. Assessments should address direct and indirect, combined, short- and long-term, beneficial and adverse impacts, as well as cumulative impacts in combination with other known developments and activities. An estimation of the reliability of predictions should also be provided
- a description of the stakeholder consultation undertaken
- responses to issues raised during public and the stakeholder consultation.

The main report is required to be supported by appendices containing relevant data, technical reports and other sources of the EIS analysis. In preparing the EIS, the approach to be adopted requires that:

- predictions of environmental impacts are based on scientifically supported studies
- the EIS is to present all technical data, sources of authority and other information used to assess impacts
- the methods used to undertake the specialist studies are outlined, together with the relevant assumptions and professional or scientific judgments
- the scientific reliability of investigations and predictions is indicated, including the estimated degree of certainty or if possible, statistical confidence wherever appropriate
- proposed measures to mitigate and manage identified issues are described and evaluated
- residual impacts that are not quantifiable are described qualitatively, in as much detail as reasonably practicable.

The assessment of all environmental impacts needs to encompass both potential impacts on, and uncertain risks to, the environment. The level of investigation of potential impacts or particular risks needs to be proportionate to both the severity of the potential consequences of possible events and the likelihood of those events occurring.

Specific types of relevant impacts requiring investigation are set out in part B. However, the EIS will need to address other issues or aspects that may emerge during the investigations and preparation of the EIS. It is the proponent's responsibility to ensure that adequate studies are undertaken and reported.

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

The level of analysis and detail in the EIS should reflect the level of significance of the expected impacts on the environment. Any prudent and feasible alternatives should be discussed and treated in sufficient detail, and reasons for selection of the preferred option should be clearly identified.

Information provided in the EIS should be clear, logical, objective and concise, so that non-technical persons may easily understand it. Where appropriate, text should be supported by maps and diagrams. Factual information contained in the document should be referenced wherever possible. Where applicable, aerial photography and/or digital information should be presented.

The term 'detail' and 'discuss' should be taken to include both quantitative and qualitative matters as practicable and meaningful. Similarly, adverse and beneficial effects should be presented in quantitative and/or qualitative terms as appropriate. Should the proponent require any information in the EIS to remain confidential, this should be clearly indicated, and separate information should be prepared on these matters.

Within these TOR, the term 'project' includes all activities undertaken necessary for construction and operation of the proposed marine precinct and supporting infrastructure.

7. Stakeholder consultation

The proponent is required to undertake a comprehensive program of consultation with the stakeholders identified in section 2 (above). The consultation program should provide the stakeholders with the opportunity to obtain information about the project being examined by this EIS, to raise issues and express their concerns, and to receive feedback on how the proponent intends to address the issues and mitigate all adverse impacts of the project.

Consultation with the advisory agencies and the Australian Government should be the principal forum for identifying legislation, policies, regulations and guidelines relevant to the project and EIS process.

Appropriate communication processes, possibly including information bulletins and discussion papers, should be used to disseminate information about the project to a wider audience and to inform the stakeholders of the proponent's progress in the EIS process, in particular on specific issues.

The proponent is required to provide opportunities for the general public to obtain information about, and comment on, the project through such forums as public information sessions.

8. EIS format

The EIS should explain how the EIS responds to these TOR. The EIS documentation is to include appendices containing at least the following:

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

Maps, diagrams and other illustrative material should be included in the EIS to assist in the interpretation of the information. This material should be provided in a format compatible with ArcGIS.

The EIS should be produced on A4 size paper capable of being photocopied, with maps and diagrams on A4 or A3 size. The EIS document should not contain watermarks across the body of the text. The EIS should also be produced on CD-ROM/DVD.

Two separate CD-ROM/DVD copies should be provided:

1. CD-ROM/DVD copies resolution equivalent to the printed document for distribution to the stakeholders
2. CD-ROM/DVD copies for placement on the internet: Copies should be in Adobe® PDF format for placement on the internet. All compression must be down-sampled to 72 dpi. PDF documents should be no larger than 1 MB in file size. The executive summary should be supplied in HTML 3.2 format with *.jpg graphics files. Text size and graphics files included in the PDF document should

be of sufficient resolution to facilitate reading and enable legible printing, but should be such as to keep within the 1 MB file size.

The final nature and number of EIS copies required to be submitted and made available should be discussed and agreed with the CG in the early stages of the EIS process.

Part B: Contents of the EIS

The EIS should include the following sections but need not be limited to these sections or inferred structure.

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 obscure terms. The executive summary should be written as a stand alone document, able to be reproduced on request and distributed to interested parties who may not wish to read or purchase the EIS as a whole.

The structure of the executive summary should generally follow that of the EIS but focus on key issues to enable the reader to obtain a clear understanding of the project and its potential adverse and beneficial environmental, social and economic impacts and the management measures to be implemented by the proponent to mitigate all residual impacts.

The executive summary should include:

- the title of the project
- name and contact details of the proponent, a discussion of previous projects undertaken by the proponent, if applicable, and their commitment to effective environmental management
- a concise statement of the aims and objectives of the project
- the legal framework, decision-making authorities and advisory agencies
- an outline of the background to and need for the project including the consequences of not proceeding with the project
- an outline of the alternative options considered and reasons for the selection of the proposed development option
- a brief description of the project (pre-construction, construction and operational activities) and the existing environment, utilising visual aids where appropriate
- an outline of the principal environmental impacts predicted, including matters of national environmental significance,and the proposed environmental management strategies (including waste minimisation and management) and commitments to minimise the significance of these impacts
- a discussion of the cumulative impacts in relation to social, economic and environmental factors of associated infrastructure projects proposed within the region.

Glossary of terms

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

1. Introduction

The introduction should clearly explain the background and purpose of the EIS, to whom it is directed and contain an overview of the structure of the document.

1.1 Project proponent

This section should describe the experience of the project proponent including the nature and extent of business activities, experience and qualifications, and environmental record.

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.

1.3 Need for the project

This section should provide a statement of the objectives of the project and a brief outline of the events leading up to the project's formulation including alternatives, envisaged time scale for implementation and project life, anticipated establishment costs and actions already undertaken within the project area.

1.4 Relationships to other projects

This section should also describe how the project relates to any other actions of which the proponent should reasonably be aware that have been or are being taken or that have been approved in the area affected by the project.

1.5 Project need, costs and benefits

The justification for the project should be described including its strategic, economic, environmental and social implications, technical feasibility and commercial viability. The status of the project should be discussed in a regional, state and national context. The project's compatibility with relevant policy, planning and regulatory frameworks should also be described.

This section should summarise:

- the economic costs and benefits of the project to businesses and the wider community, including employment and spin-off business development
- social costs and benefits, including community disruption, related land use changes, employment, skills development and any workforce accommodation issues
- increased demand for natural resources.

1.6 Alternatives to the project

This section should describe feasible alternatives including conceptual, technological and locality alternatives to the proposed project, as well as discussion of the consequences of not proceeding with the project. Alternate breakwater options should be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and courses of action and rejecting others. Reasons for selecting the preferred options should be portrayed in terms of technical, commercial, social and natural environment aspects.

The interdependencies of the project components should be explained, particularly in regard to how each of any infrastructure requirements relate to the viability of the project.

This information is required to assess why the scope of the project is as it is and to ensure that the environmentally sustainable design principles and sustainable development aspects have been considered and incorporated during the scoping of the project. This discussion is also to outline the mix of marine facilities proposed, including consideration of recreational activities within the project.

The discussion should include:

- the alternative of taking no action
- discussion of the methodology adopted to discern between feasible options.

Section 2.01(g) of Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000 (Cwlth)* requires the following information relating to feasible alternatives to be provided:

- to the extent reasonably practicable, any feasible alternatives to the action, including:
    - if relevant, the alternative of taking no action
    - a comparative description of the impacts of each alternative on the matters protected by the controlling provisions for the action
    - sufficient detail to make clear why any alternative is preferred to another.

1.7 The environmental impact assessment process

1.7.1 Methodology of the EIS

This section should provide an outline of the approvals process including the environmental impact assessment process and any associated licence or permit application processes. It should include information on relevant stages of the approvals process, statutory and public consultation requirements and any interdependencies that exist between approvals sought.

The information in this section is required to ensure:

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

1.7.2 Objectives of the EIS

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

The purpose of the EIS is to:

- provide public information on the need for and likely effects of the project on the natural, social and economic environment
- set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values
- demonstrate how environmental impacts can be managed.

The role of the EIS in providing information for the formulation of the environmental management plan for the project should be discussed. Discussion of options and alternatives is a key aspect of the EIS.

1.7.3 Submissions

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

1.8 Public consultation process

An appropriate public consultation program is an important component of the EIS process.

This section should outline the methodology that will be adopted to:

- identify the stakeholders and how their involvement will be facilitated
- identify the process conducted to date and future consultation strategies and programs including during the operational phase of the project
- indicate how consultation involvement and outcomes will be integrated into the EIS process and future site activities including opportunities for engagement and provision for feedback and action if necessary.

A list of the stakeholders consulted during the program should be provided as well as any meetings held, presentations made and any other consultation undertaken for the EIS process.

The public consultation process should identify broad issues of concern to local and regional community and interest groups, and address issues from project planning through commissioning and project operations. A consultation plan should be prepared during the initial phase of the EIS process. This should identify:

- the types of consultation and communication activities to be undertaken
- timing
- target the stakeholder/community representatives
- integration with other EIS activities and the project development process
- consultation responsibilities
- communication protocols
- reporting and feedback arrangements.

Information about the consultation process that has taken place and the results should be provided.

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

1.9 Project approvals

1.9.1 Relevant legislation and policy requirements

The aim of this section is to provide the reader with an explanation of the legislation and policies controlling the approvals process for the project. All requirements of the legislation applicable to the project should be provided in the EIS, including (but not limited to) the:

- *Aboriginal Cultural Heritage Act 2003 (Qld)*
- *Coastal Protection and Management Act 1995 (Qld)*
- *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*
- *Environment Protection (Sea Dumping) Act 1981 (Cwlth)*

- *Environmental Protection Act 1994 (Qld)*
- *Fisheries Act 1994 (Qld)*
- *Great Barrier Reef Marine Parks Act 1975 (Cwlth)*
- *Integrated Planning Act 1997 (Qld)*
- *Native Title Act 1993 (Cwlth)*
- *Nature Conservation Act 1994 (Qld)*
- *Queensland Heritage Act 1992*
- *Transport Infrastructure Act 1994 (Qld)*
- *Vegetation Management Act 1999 (Qld)*
- *Water Act 2000 (Qld).*

The EIS should describe the approval process resulting from the declaration of this project as a 'significant project for which an EIS is required' pursuant to the SDPWO Act and outline the linkages to other relevant state and Australian legislation. This section should describe the public notification processes and appeal rights that will be available in the anticipated approval processes. The EIS should indicate the extent of approvals for each project element so that approval agencies can determine the completeness of the information presented.

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

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

1.9.2 Planning processes and standards

This section should discuss the project's consistency with existing land uses or long term policy framework for the area (e.g. as reflected in local and regional plans), and the 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. In particular, this section should highlight requirements of the *Environmental Protection Act 1994 (Qld)* (EP Act), such as 'ecologically sustainable development', 'best practice environmental management', and the 'general environmental duty' and any relevant environmental protection policies including the *State Coastal Management Plan – Queensland's Coastal Policy 2001*. There should be an outline of the EIS process as adapted to the project requirements with approximate time lines included.

Local government plans, local laws and policies applying to the development should be described, and a list provided of the approvals required for the project and the expected program for approval of applications. Reference should be made to the implications for development of strategic port land and relevant development approval processes.

This information is required to make clear how the project conforms to state, regional and local plans for the area.

1.9.3 Accredited process for controlled actions under Australian legislation

The Australian Government has accredited the state's EIS process for the purposes of the Australian Government assessment under Part 8 of the EPBC Act.

When a state EIS process has been accredited, it is necessary for the TOR to address potential impacts on the matters of national environmental significance that have been identified as the controlling provisions for the project. This project has been determined to be

a controlled action by the Australian Government under the EPBC Act and the controlling matters are as follows:

- Sections 12 and 15A (World Heritage properties)
- Sections 15B and 15C (national heritage places)
- Sections 16 and 17B (wetlands of international importance)
- Sections 18 and 18A (listed threatened species and communities)
- Sections 20 and 20A (listed migratory species).

A stand-alone report addressing the matters of national environmental significance must be provided as an appendix to the EIS that exclusively and fully addresses the issues relevant to the controlling provisions. This stand-alone section should include:

1. 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.

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

- the current species 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 proposal
- current pressures on the species, especially those in the area to be affected by the proposal
- relevant controls or planning regimes already in place.

2. Assessment of relevant impacts and mitigation measures

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 residual 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.

The following potential impacts may need to be addressed in the EIS. The impacts are provided as a guide for specific matters of national environmental significance.

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
- interfere with the recovery of the species or
- consistency with recovery plans.

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
- 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.

3. Consideration of any potential offsets to ameliorate residual impacts

4. Conclusions

5. References

2. Description of the project

The objective of this section is to describe the project through its lifetime of construction, operation and decommissioning. 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.

2.1 Overview of project

The EIS should provide an overview of the project to put it into context. This section should include:

- reasoning as to the preferred operating scenario such as cost, environmental impacts, operational efficiencies of corridor, operational efficiencies of each option
- a description of the key components of the project through the use of text and design plans where applicable
- the expected cost and overall duration and timing of the project
- a summary of any environmental design features of the project should be presented.

2.2 Location

This section should describe the regional and local context of the project and associated infrastructure and illustrated on maps at suitable scales. Real property descriptions of the project should be provided. Maps should show the precise location of the project area, in particular:

- the location and boundaries of land tenures, in place or proposed, that the project area is or will be subject to
- the location and boundaries of the project footprint, including easement widths and access requirements
- the location of any proposed buffers surrounding the working areas (for construction)
- the location of roads, waterways, sand banks, shorelines and navigation channel/aids
- extent of strategic port land and future strategic port land
- The location of proposed site office(s).

2.3 Construction

The extent and nature of the project's construction phases should be described. The description should include the type and methods of construction to be employed, the construction equipment to be used and the items of plant to be transported onto the construction site. Approaches to the construction of the proposed breakwater should be included as well as a description of the proposed dredge plant and equipment which would be employed. The estimated numbers of persons to be employed during the project construction phase should also be given.

A description of possible phasing/staging of the project should be provided having regard to:

- the timing of construction of the proposed Townsville Port Access Corridor (road and rail)
- objectives to limit disturbance to existing users of the Ross River, including recreational fishers utilising the Barnicle Street boat ramp, commercial fishers and other maritime industries upstream of the project area.

2.3.1 Pre-construction activities

This section should set out a description of the pre-construction activities, including:

- any land acquisitions required, be it in full or as easements, leases
- vegetation clearing
- site establishment requirements for construction facilities, including access restriction measures
- temporary works
- upgrade, relocation, realignment or deviation of roads and other infrastructure.

2.3.2 Tidal works – dredging and reclamation

Describe the location and extent of the proposed reclamation, the source(s) of fill and the likely construction methodologies. Information provided in this section should be in accordance with the former Environmental Protection Agency (EPA) Guidelines *Reclaiming land under tidal water* (2005) and *Allocation of quarry material* (2004), with reference to relevant policies of the State Coastal Management Plan relating to reclaiming land.

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

- describe and map the location, area and volume of dredging required, differentiating capital from historical or current dredge areas (including cross-sectional diagrams) within the Ross River channel and the proposed marine precinct. The EIS should provide maps and map overlays that indicate areas which have been disturbed and those areas which have not been disturbed historically
- the boundary of land to be reclaimed by metes and bounds, tied to real property boundaries, the location of the line of mean high water spring tide and coastal management district (includes all land contained within erosion prone areas) in relation to the reclamation area
- existing levels of the land and proposed final levels of reclamation in relation to the Australian Height Datum
- method of protecting seaward boundary of the reclamation from erosion by the sea
- details of estimated commencement, completion, rate of progress and estimated cost of the reclamation
- provide details of the grading and composition of likely dredged materials including potential contaminants and/or indurated (hardened or cemented) layers and the methods and sites for disposal via land or sea
- describe proposed disposal methods and locations, including any off-shore options for disposal of maintenance dredge spoil of possibly varying constituencies to be designated dredge spoil disposal/rehandling areas
- quantify the expected amount of maintenance dredging required, the expected frequency of maintenance dredging and the expected composition of dredged material
- describe provisions for maintenance dredging in the event of a major cyclone, flood or other extreme conditions
- provide details of the dredging methods including timing of capital dredging and dredge material disposal in terms of avoiding or minimising impacts on, birds, marine mammals, turtles and fish, including migrations and marine plant propagation.

2.3.3 Structures

Describe the location and extent of the proposed breakwater and the likely construction methodologies.

The description of all structures is to be provided including:

- locations and dimensions of buildings and marine infrastructure associated with the marine precinct
- the likely interface of the marine precinct infrastructure with the future port road and rail infrastructure
- the likely construction methodologies
- earthworks, including fill that may need to be imported to the project site
- pollution control methods that will be used to prevent pollution entering marine areas during the construction
- modifications that may be needed to accommodate climate change and sea level rise.

2.3.4 Commissioning

A description of the commissioning process including the associated environmental impacts should be provided.

2.4 Operations

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

- a description of plant and equipment to be employed
- a description of the type, size and capacity of activities and facilities proposed
- the capacity of plant and equipment
- maintenance dredging requirements
- a description of arrangements for long-term maintenance of the marine facilities including details of the responsible parties
- details of the predicted usage of the marine facilities, including opportunities for recreational and public usage
- detailed requirements of vessel operations including tugs, pilotage, channel closures, quarantine and security arrangements etc.
- the numbers of people to be employed in the project operations
- opportunities provided for future expansion.

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

2.4.1 Rehabilitation

This section should present general strategies and methods for decommissioning and rehabilitation of the project should it ever be required.

2.5 Associated infrastructure requirements

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

2.5.1 Workforce and accommodation

This section should provide details on the employment requirements and skills base of the required workforce for both the construction and operations phases of the project, including:

- size and source of construction and operations workforce
- deployment strategies proposed for the workforce over the construction period
- employment opportunities, including details of the required professional, skilled and semi-skilled labour requirements of the project
- information regarding the occupational groupings required for the workforce
- new skills and training to be introduced in relation to the project.

This section should also discuss the accommodation needs for the construction workforce that addresses the estimated housing needs of both single and accompanied construction workers.

2.5.2 Transport

Access to the project location is currently via Benwell Road. The project will necessitate a significant change to this road. The proposed Townsville Port Access Corridor will also provide access to the proposed Marine Precinct.

The EIS should 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 summarise how access will occur with the proposed Townsville Port Access Corridor and actions to ensure the proposal does not adversely impact upon the integrity of the proposed arterial connection.

Full details of transport impacts should be provided under section 3.2

2.5.3 Energy

The EIS should describe all energy requirements, including electricity, natural gas, and/or solid and liquid fuel, for the construction and operation of the project. The locations of any easements should be shown on the infrastructure plan. Energy conservation should be briefly described in the context of any Australian, state and local government policies. Discussion should also address opportunities for the use of alternative sources of energy (e.g. wind, solar) and specifically the potential for the incorporation of actions from or in cooperation with the Townsville 'Solar Cities' program.

2.5.4 Water supply and storage

The EIS should provide information on water usage by the project, including the quality and quantity of all water supplied to the site. In particular the proposed sources of water supply should be described (e.g. municipal water supply pipelines), the connection requirements, including likely upgrades, and the capacity of proposed providers to supply.

Determination of potable water demand should be made for the project. Details should be provided of any existing town water supply to meet such requirements. Any proposed water conservation and management measures should be described.

2.5.5 Stormwater drainage

A description should be provided of the proposed stormwater drainage system, proposed treatment of contaminants and method of removal, disposal/discharge and/or re-use arrangements, including any off-site services and downstream impacts. The use of best practise stormwater quality management (including stormwater management measures) should be used to ensure that environmental values of coastal waters are protected.

2.5.6 Sewerage

This section should describe, in general terms, the sewerage infrastructure required by the project. The quantity and content of proposed effluent should be outlined. The proposed method for disposal of all effluent should be detailed, including the capacity of the Townsville City Council to accept the proposed sewage, with identification of any necessary network upgrades.

For industrial effluent, this should include detail of the physical and chemical characteristics of the effluent(s).

2.5.7 Telecommunications

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

2.5.8 Waste management

This section should provide a brief overview of the waste management requirements of the project. Full details of the waste volumes, characteristics and management strategies should be provided in section 3.11.

3. Environmental values and management of impacts

The functions of this section are to:

- describe the existing environmental values of the area which may be affected by the proposal. Environmental values are defined in section 9 of the EP Act, environmental protection policies and other documents such as the ANZECC *Guidelines for fresh and marine water quality* (2000). Environmental values may also be derived following recognised procedures, such as described in the ANZECC Guidelines. Environmental values should be described by reference to background information and studies, which should be included as appendices to the EIS
- describe the potential adverse and beneficial impacts of the proposal on the identified environmental values. Any likely environmental harm on the environmental values should be described
- describe any cumulative impacts on environmental values caused by the proposal, either in isolation or by combination with other known existing or planned infrastructure projects and sources of contamination
- present environmental protection objectives and the standards and measurable indicators to be achieved
- 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 prevent, or where prevention is not possible, minimise environmental harm and maximise socio-economic and environmental benefits of the proposal. Preferred measures should be identified and described in more detail than other alternatives.

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

This section should address all elements of the environment such as land, water, air, noise, nature conservation, cultural heritage, waste, health and safety 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 and/or qualitatively the likely impact of the proposal on the identified environmental values of the area. The cumulative impacts of the proposal must be considered over time or in combination with other (all) impacts in the dimensions of scale, intensity, duration or frequency of the impacts. In particular, any requirements and recommendations of the relevant state planning policies, environmental protection policies, national environmental

protection measures and integrated catchment management plans should be addressed.

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

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

- Environmental protection objectives: describe qualitatively and quantitatively the proposed objectives for enhancing or protecting each environmental value. Include proposed indicators to be monitored to demonstrate the extent of achievement of the objective as well as the numerical standard that defines the achievement of the objective (this standard must be auditable). The measurable indicators and standards can be determined from legislation, support policies and government policies as well as the expected performance of control strategies. Objectives for progressive and final rehabilitation and management of contaminated land should be included.
- Control strategies to achieve the objectives: describe the control principals, proposed actions and technologies to be implemented that are likely to achieve the environmental protection objectives; include designs and 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 e.g. 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 (e.g. 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 EIS reasonably reflect the heading structure shown below. The mitigation measures, monitoring programs etc., identified in this section of the EIS should be used to develop the environmental management plan for the project (see section 7).

3.1 Land

This section should detail the existing land environment for all areas associated with the project. This section should also describe the potential for the construction and operation of the project to change existing and potential land uses of the project sites and adjacent areas.

3.1.1 Topography and geomorphology

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).

Commentary on the maps should be provided highlighting the significant topographical features, specifically:

- the topography of the project site should be mapped showing contours at suitable increments, as well as the relationship between to the Australian Height Datum (AHD) and any tidal planes, with maps produced being consistent in the datum used for comparison
- the location of key tidal planes such as the Highest Astronomical Tide (HAT); Mean High Water Spring Tide (MHWS); Mean High Water Neap Tide (MHWN); Mean Sea Level (MSL); Mean Low Water Neap Tide (MLWN); Mean Low Water Spring Tide (MLWS) and Lowest Astronomical Tide (LAT) should be shown
- mapping and description of the bathymetry of the project area and surrounds
- relevant coastal geomorphology should be characterised and supported by illustrative mapping.

3.1.2 Geology and soils

3.1.2.1 Description of environmental values

The EIS should provide a description, map and a series of cross-sections of the geology of the project, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the areas of disturbance. Properties which may influence stability, occupational health and safety, rehabilitation programs, or the quality of waste water leaving any area disturbed by the project should be described.

A soil survey of the project area should be conducted at a suitable scale, with particular reference to the physical and chemical properties of the materials which will influence erosion potential, and storm water run-off quality.

An assessment of the potential for acid sulfate soils involving sampling and testing should be conducted in accordance with Queensland Acid Sulfate Soils Management Advisory Committee (QASSMAC) guidelines and the State Planning Policy 2/02: *Planning and Managing Development Involving Acid Sulfate Soils* and its accompanying *Guideline 2/02*. The guidelines for sampling and analysis of lowland acid sulfate soils in Queensland should be consulted for more detailed information on how to conduct an acid sulfate soil investigation.

3.1.2.2 Potential impacts and mitigation measures

For all permanent and temporary land forms, possible erosion rates and management techniques should be described. For each soil type identified, erosion potential (wind and water) and erosion management techniques should be outlined.

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

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

- the marine facilities site, including buildings
- access roads or other transport corridors
- any waste dumps

- crossings over Ross Creek or Ross River.

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

The potential for acid generation by disturbance of acid sulfate 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.

Should action criteria be triggered by acid generating potential as a result of testing, management measures are to be outlined in an Acid Sulfate Soils Management Plan prepared in accordance with Queensland Acid Sulfate Soils Investigation Team (QASSIT) guidelines and the requirements of State Planning Policy 2/02: *Planning and Managing Development Involving Acid Sulfate Soils* and its accompanying *Guideline 2/02*. Consultation with officers of the Department of Environment and Resource Management (DERM) is required in the preparation of the management plan.

3.1.3 Land contamination

3.1.3.1 Description of environmental values

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

In short, the following information needs to be presented in the EIS:

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

3.1.3.2 Potential impacts and mitigation measures

The EIS should discuss the management of any contaminated land and potential for contamination from construction, commissioning and operation, in accordance with DERM (formerly EPA) *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (1998) and the *National Environment Protection (Assessment of Site Contamination) Measure* (1999).

This section should describe strategies and methods to be used to prevent and manage any land contamination resulting from the project, including the management of any acid generation or management of chemicals and fuels to prevent spills or leaks.

3.1.4 Land use

3.1.4.1 Description of environmental values

The EIS should identify, with the aid of maps:

- land tenure, including reserves, tenure of special interest such as protected areas and forest reserves, identification of existing and proposed gas, water pipelines, power lines and transport corridors, including local roads, state-controlled roads and rail corridors
- existing land uses and facilities surrounding the project

- areas covered by applications for native title claims or native title determinations, providing boundary descriptions of native title representative body(ies). The proponent should also identify in the EIS whether there are any necessary notifications required to the representative body(ies) or evidence that native title does not exist
- distance of the project from residential and recreational areas
- location of the project in relation to environmentally sensitive areas.

3.1.4.2 Potential impacts and mitigation measures

The potential for the construction and operation of the project to change existing and potential land uses of the project site and adjacent areas should be detailed.

A description of the following should be included:

- management of the immediate environs of the project including construction buffer zones, and information on how easement widths and vegetation clearance in sensitive environmental areas will be minimised
- the identification of the potential native title rights and interests likely to be impacted upon by the project and the potential for management of those impacts by an Indigenous Land Use Agreement or other native title compliance outcomes
- direct impacts on any areas of high conservation value, including national parks, Ramsar sites, declared Fish Habitat Areas or other areas designated to be of high conservation value (including impacts on accessibility)
- impacts on surrounding land uses and human activities and strategies for minimisation, including residential, recreational fishing and boating activities and active and passive open space and industrial uses. This description is also to outline any opportunities for public access for recreational purposes
- possible effect on town planning objectives and controls, including local government zoning and strategic plans
- the process required to address land use planning requirements for the land likely to be vacated by the existing marine industry and commercial fishing operations currently located in Ross Creek, as well as upstream in Ross River
- constraints to potential developments and possibilities of rezoning adjacent to the development area
- potential issues involved in proximity and/or co-location of other current or proposed infrastructure services along the rail corridor
- potential impacts on future road upgrades
- identification of any land units requiring specific management measures.

3.1.5 Landscape character and visual amenity

The function of this section is to define all adverse and beneficial impacts associated with the project, and describe the objectives for protecting or enhancing landscape character and visual amenity, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

3.1.5.1 Scenic values

The EIS should detail the scenic and landscape values of the area focusing on the visual absorption capacity of the site and the existing values related to the scenic and landscape values of the area, including the World Heritage and national heritage values of the Great Barrier Reef World Heritage Area.

Sketches, diagrams, computer imaging and photos are to be used where possible to portray the near views and far views of the completed structures and their surroundings from visually sensitive locations.

The EIS should discuss the visual impact of the construction and operation of the project as it relates to the surrounding landscape. The assessment should address the local and broader visual impacts of the project buildings, other structures, and breakwater. Appropriate simulation to portray the near views and far views of the completed structures and their surroundings from visually sensitive locations should be utilised. This should include views from places of residence, work, and recreation, from road, cycle and walkways, from the air and other known vantage points day and night, during all stages of the project as it relates to the surrounding landscape.

Information should be supplied on the techniques proposed to minimise visual impacts. Special consideration should be given to public roads or thoroughfares or places of residence, recreation, or work which are within the line-of-sight of the project site.

3.1.5.2 Landscape character

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. Particular reference should be made to the following:

- impacts on existing land use that contribute to the character of the local area
- potential impacts to scenic amenity of any conservation area
- the visual absorption capacity of the site – its ability to absorb the impact of the proposed development.

3.1.5.3 Lighting

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

- the visual impact at night
- 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.

3.2 Transport and infrastructure

3.2.1 Description of environmental values

The EIS should provide sufficient information for transport authorities (Department of Transport and Main Roads and local government) and emergency service providers to make an independent assessment of how the state-controlled and local government road networks will be affected.

The EIS should provide details of the extent of existing and planned transport infrastructure, including identification of road and rail infrastructure providers. Particular mention must be made of the interaction with the proposed Port Access Transport Corridor. This will include identification and analysis of construction measures for the interface between the marine precinct and the Townsville Port Access Corridor (road and rail). This should also demonstrate that the integrity of the future road/rail corridor will be maintained.

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

3.2.2 Potential impacts and mitigation measures

The EIS should include detailed analysis of probable impact of identified construction and operational traffic generated by the project with particular attention to impacts on road infrastructure, road users, adjacent residences, road safety and parking. Consideration should also be given to impacts on the natural environment within the jurisdiction of the affected transport authority and any socio-economic impacts or contribution by the project at the local or regional level.

The EIS needs to identify impacts on the state-controlled and local government road networks (including any existing and proposed pedestrian and cycle networks) and to indicate clearly the corrective measures necessary to address adverse road impacts and the costs involved (e.g. overland water flow impacts on the road network resulting from project works). This will require the proponent to compare the traffic situation and road conditions with, and without, the project. Any new access requirements or alterations to transport related infrastructure resulting from the project must be detailed. This includes modifications to roads for access works and realignments, and rail lines (including level crossings and services), air, and sea port facilities (if relevant). This assessment is also to consider impacts on existing public transport networks.

The EIS should provide sufficient detail to allow an independent assessment for each infrastructure item during the construction and operational phases including:

- existing traffic volumes on the proposed transport routes and associated access points
- details of how existing transport infrastructure will be affected by the project generic requirement
- the volume, origin and destination of goods to be moved including construction materials, plant, raw materials, wastes and hazardous materials, with the use of maps
- details on possible interruptions to transport operations
- 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
- provision for car, trailer and truck parking
- the proposed transport routes
- need for mitigation of noise and other nuisance to existing residents during construction and operations
- condition of affected transport network, capacity and performance and the need for increased road maintenance and upgrading.

Road infrastructure impacts should be described and assessed according to DTMR (formerly Department of Main Roads (DMR)) *Guidelines for Assessment of Road Impacts of Development Projects* (2006). Reference should also be made to other relevant DTMR planning documents as required.

The EIS should also provide details of assessment methodology adopted including a summary of consultation undertaken with transport authorities regarding the scope of the impact assessment and methodology used.

The EIS should describe any impacts on existing services (gas, electricity, water, sewerage, telecommunications etc.) infrastructure which may be impacted by the project and identify any proposed upgrades, changes to existing levels of provision and how these will be managed.

The capacity of any system to supply or accept loading from the development should be investigated with options developed for upgrading capacity if required.

Mitigation strategies are to be detailed in a draft road-use management plan, to be finalised in consultation with DTMR and local government, which will:

- consider transport authority's works programs and forward planning that may affect the study area
- detail impact mitigation strategies including the construction of new transport infrastructure referencing relevant road authority standards and practices (any required road works should be designed and constructed in accordance to the DTMR (formerly DMR) *Road Planning and Design Manual* (2004) as amended or local government standard as required)
- provide timing, responsibilities and financial contribution for any required road works and additional transport infrastructure. (Traffic management issues for any required road works and any approvals under the *Transport Infrastructure Act 1994* may be finalised in a traffic management plan at the project pre-construction stage)
- provide information on product spill contingency plans and the adequacy of equipment and facilities to deal with possible spills for the transport modes of the project if applicable. Indicate whether there is a need to update existing plans based on increase in frequency of traffic and volumes to be transported.

It is understood that some detailed design elements of the road-use management plan may not be known prior to completion of the EIS and that this information will be supplied subsequently to the DTMR and other road authorities.

3.3 Climate and natural disasters

This section should describe the rainfall patterns (including magnitude and seasonal variability of rainfall), air temperatures, humidity, wind (direction and speed) and any other special factors (e.g. temperature inversions) that may affect management of the project. Historic weather patterns in the project area and seasonal conditions (e.g. cyclones, thunderstorms, floods and storms) that may influence timing and/or construction methods should be discussed, including how this would be managed. Extremes of climate (e.g. droughts, floods etc.) should be discussed.

The vulnerability of the area to natural or induced hazards, such as cyclones, storm tides, bushfires and earthquakes should be addressed. The relative frequency and magnitude of these events should be considered together with the risk they pose to the construction and operation of the project. Consideration should be given to the DERM (formerly EPA) Guideline *Mitigating the Adverse Impacts of Storm Tide Inundatio*n when assessing storm tide and inundation. Hazard and risk assessment and management should be provided in section 6.

3.3.1 Climate change adaptation

The EIS should provide an assessment of the project's vulnerabilities to climate change and describe possible adaptation strategies for the activity including:

- the implications of climate change on the project's environmental and commercial feasibility should be discussed with particular reference to rainfall, sea level rise and the occurrence of extreme water level and wave conditions
- the preferred and alternative adaptation strategies to be implemented
- commitments to undertaking, where practicable, a cooperative approach with government, other industry and other sectors to address adaptation to climate change.

It is noted that that predictions of climate change and its effects have inherent uncertainties, and that a balance must be found between the costs of preparing for climate change and the

uncertainty of outcomes. However, the proponent should use its best efforts to incorporate adaptation to climate change in their EIS and project design.

3.4 Surface waterways

3.4.1 Description of environmental values

The function of this section is to describe the existing environment for surface waterways which may be affected by the project in the context of environmental values as defined by the *Environmental Protection Act 1994* and environmental protection policies.

A description should be given of the Ross River, Ross Creek and other overland flows, their quality and quantity in the area affected by the project with an outline of the significance of these waters to the river catchments system in which they occur.

Details provided should include a description of existing surface drainage patterns, flows in major streams and wetlands. Also provide details of the likelihood of flooding, history of flooding including extent, levels and frequency, and a description of present and potential water uses downstream of the areas affected by the project. The basis for this description should be a monitoring program, with sampling stations located upstream and downstream of the areas of disturbance.

A description of the environmental values of the surface waterways of the affected area should be provided in terms of:

- values identified in the Environmental Protection (Water) Policy
- sustainability, including both quality and quantity
- physical integrity, fluvial processes and morphology of watercourses, including riparian zone vegetation and form
- any water resource plans, land and water management plans relevant to the affected catchments.

3.4.2 Potential impacts and mitigation measures

The function of this section is to define all potential adverse and beneficial impacts associated with the project and describe the objectives for protecting or enhancing surface waterway environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

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

In particular, assessment of impacts on the flow and the quality of surface waters and effects on ecosystems should include an assessment of the likely effects on mangrove and other estuarine habitats as a result of any temporary diversion of existing water courses.

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

The Australian and New Zealand Environment and Conservation Council (ANZECC) *National Water Quality Management Strategy*, *Australian Water Quality Guidelines for Fresh and Marine Waters* (1992) and the Environmental Protection (Water) Policy should be used as a reference for evaluating the effects of various levels of contamination.

The EIS should also refer to the *Queensland Water Quality Guidelines* (2006) published by the former EPA to determine appropriate physical and chemical indicators based on the regional guideline values.

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.

3.5 Groundwater resources

3.5.1 Description of environmental values

The function of this section is to describe the existing environment for groundwater resources which may be affected by the project in the context of environmental values as defined by the EP Act and environmental protection policies.

The EIS should review the quality, quantity and significance of groundwater in the project area, together with groundwater use in neighbouring areas.

3.5.2 Potential impacts and mitigation measures

The function of this section is to define all potential adverse and beneficial impacts associated with the project and describe the objectives for protecting or enhancing groundwater resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of the objectives will be monitored, audited and managed.

The EIS should include an assessment of the potential environmental harm caused by the project to local groundwater resources. Where appropriate, the EIS should consider the potential impacts of marine derived groundwater on engineering and infrastructure components and also the enhanced impacts of groundwater of the development due to a mobile groundwater system.

3.6 Coastal environment

The function of this section is to describe the existing coastal environment, which may be affected by the project in the context of coastal values identified in the Queensland State of the Environment Reports and environmental values as defined by the EP Act and Environmental Protection Policies.

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*.

The EIS should assess the project's consistency with the relevant policies of the State Coastal Management Plan.

3.6.1 Hydrodynamics and sedimentation

3.6.1.1 Description of environmental values

Provide an assessment of physical and chemical characteristics of sediments within the littoral and marine zone of Cleveland Bay adjacent to the project area.

Describe the physical processes of Cleveland Bay including waves, currents, tides, storm surges, freshwater flows and the key influencing factors of cyclones and other severe weather events and their interaction in relation to the assimilation and transport of pollutants entering marine waters from, or adjacent to, the project area. Describe the environmental values of the coastal resources of the affected area in terms of the physical integrity and morphology of landforms created or modified by coastal processes.

Describe the tidal hydrodynamics of the project area and the adjoining tidal waterways in terms of water levels and current velocities and directions at different tidal states. Two and/or three-dimensional modelling should be undertaken. Provide details of water levels and flows associated with historical and predicted storm surges.

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

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

Predict the likely changes to hydrodynamics (including water levels, currents, wave conditions and freshwater flows) and sedimentation in the project area due to climate change.

3.6.1.2 Potential impacts and mitigation measures

Describe the potential changes to the hydrodynamic processes and local sedimentation due to the creation of berth pockets, breakwater and potentially an access channel. This should include a review of previous studies which have concluded that existing port structures (reclaimed land and breakwaters perpendicular to the natural shoreline) have interrupted the primary mechanisms for sediment movement along the coastline.

For each breakwater scenario, modelling should identify any proposed changes to existing sand areas that provide a habitat for significant bird species, including sand accretion areas that might compensate for any loss of existing bird habitat.

Coastal processes such as erosion and accretion at adjacent locations including but not limited to The Strand, Rowes Bay, Pallarenda are to be considered when assessing the hydrodynamics of the area and movement of sediment along the coast.

Discuss any impacts on upstream flood risk in the Ross River and any mitigation measures that may be required.

3.7 Water quality

3.7.1 Description of environmental values

Provide baseline information on coastal water quality, including heavy metals, acidity, turbidity and oil in water. Discuss the interaction of freshwater flows from the Ross River and Ross Creek with marine waters and its significance in relation to marine flora and fauna within and adjacent to the project area.

Baseline water quality values should be collected at site-specific locations with the precinct. The description of baseline water quality should include a discussion on blue green algae (*Trichdesmium sp.*) blooms, their frequency within in the bay as well as causal factors.

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

- variability associated with the local wind climate, seasonal factors, freshwater flows and extreme events
- values identified in the Environmental Protection (Water) Policy and the State Coastal Management Plan.

3.7.2 Potential Impacts and mitigation measures

The water quality objectives and practical measures for protecting, mitigating 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. State Planning Policy 2/02: *Planning and Managing Development Involving Acid Sulfate Soils* should be addressed as should the State Coastal Management Plan and the Department of Employment, Economic Development and Innovation (DEEDI) (formerly Department of Primary Industries and Fisheries) *Guidelines for Marine Areas*.

Specific issues to be addressed include:

- describing the water quality objectives used (including how they were developed), and how predicted activities will meet these objectives (refer to the DERM *Queensland Water Quality Guidelines* and the ANZECC *Guidelines for Fresh and Marine Water Quality*, 2000)
- potential threats to the water quality and sediment quality of the Ross River and Cleveland Bay associated with the construction and operation of the facilities.

This assessment shall consider, at minimum:

- dredging and dredge material disposal, including disturbance of fine grained sediments and contaminated material
- potential accidental discharges of contaminants during construction and operation of the marine precinct
- release of contaminants from marine structures and vessels, including potential for the introduction of marine pests
- stormwater runoff from the marine precinct facilities and associated infrastructure
- flooding of the Ross River and other extreme events.

Strategies for protecting Ramsar wetlands should be described, and any obligations imposed by state or Australian legislation or policy or international treaty obligations (i.e. JAMBA and CAMBA) should be discussed.

3.7.3 Sediment quality and dredging

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 and pesticides), the presence of fines and/or indurated layers and acid sulphate potential. This information should be presented as a map of sediment types based on their physical and chemical properties and include depth profiles.

Assessment of marine sediments should be undertaken in accordance with the *National Ocean Disposal Guidelines for Dredge Materia*l (Environment Australia, 2000).

Detail specific measures to maintain sediment quality to nominated quantitative standards within the project and surrounding areas, particularly where future maintenance dredging may be required.

Provide comment on the choice of the disposal site in relation to coastal management outcomes, having regard to the nature of the spoil, cost of alternatives and potential impacts on coastal resources and their values.

Describe provisions for dredge material disposal and associated impacts on sediment quality. Discuss disposal options for contaminated material, if required. This must include a description of the arrangements to be put in place for long term (20 years) dredge material disposal including details of proposed material placement areas.

3.8 Nature conservation

This section should detail the existing nature conservation values of the project area. The environmental values of nature conservation for the affected area should be described in terms of:

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

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

Reference should be made to relevant Queensland and Australian Government legislation and policies on threatened species and ecological communities including recovery plans.

The EIS should address any actions of the project or likely impacts that require an authority under the *Nature Conservation Act 1992*, and/or would be assessable development for the purposes of the *Integrated Planning Act 1997*, *Vegetation Management Act 1999* and the *Fisheries Act 1994*.

All surveys undertaken should be in accordance with recognised best practice, including consideration of advice from the DERM, and should include consideration of seasonality, potential for occurrence of significant species, rarity of species and the sensitivity of the species to disturbance. This section should also discuss all likely direct and indirect environmental impacts on flora and fauna in both terrestrial and aquatic environments in sensitive areas.

Wherever possible seek the involvement of the local Indigenous community in the conduct of field observations and survey activities to identify the traditional and contemporary Indigenous uses of species.

The EIS should demonstrate how the project would comply with the following hierarchy:

- avoiding impact on areas of remnant vegetation and other areas of conservation value
- mitigation of impacts through rehabilitation and restoration
- measures to be taken to replace or offset the loss of conservation values where avoidance and mitigation of impacts cannot be achieved
- explanation of why measures above would not apply in areas where loss would occur.

Where relevant, this section should discuss environmental offset requirements in accordance with the Queensland Government Environmental Offsets Policy and taking into account the applicable specific-issue offset policies, as follows:

- *Policy for Vegetation Management Offsets* (NRW, 2007)
- *Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss* (DPI&F, 2002)
- draft *Policy for Biodiversity Offsets* (consultation draft, EPA, 2008).

The boundaries of the areas impacted by the project within or adjacent to an endangered ecological community, including details of footprint width should be discussed. Where the project area would impact upon a threatened community, the discussion should include reasons for the preferred alignment and the viability of alternatives.

The description should indicate any areas of state or regional significance identified in an approved biodiversity planning assessment produced by the DERM.

3.8.1 Sensitive environmental areas

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

In particular, the EIS should indicate if the area 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, 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 and CAMBA), areas of cultural significance and scientific reserves.

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

- important habitats of species listed under the NC Act and/or EPBC Act as presumed extinct, endangered, vulnerable or rare
- regional ecosystems recognised by the DERM as 'endangered' or 'of concern' and/or ecosystems listed as presumed extinct, endangered or vulnerable under the EPBC Act
- sites listed under international treaties such as Ramsar wetlands and World Heritage areas
- sites containing near threatened or bioregionally significant species or essential, viable habitat for near threatened or bioregionally significant species (i.e. Cleveland Bay Fish Habitat Area)
- 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) including 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 species of special cultural significance
- 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 important buffers to a protected area or important habitat corridor between areas
- protected areas that have been proclaimed under the NC Act or are under consideration for proclamation
- areas of major interest, or critical habitat declared under the NC Act or high nature conservation value areas or areas vulnerable to land degradation under the Vegetation Management Act
- 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.

Short term and long term durations should be considered and whether the effects are reversible or irreversible.

3.8.2 Terrestrial ecology

3.8.2.1 Description of environmental values

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. 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.

Reference should be made to both state and Australian endangered species legislation.

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

The DERM (formerly EPA) *Guidelines for Fauna and Flora Assessment in EIS* provide further details. The DERM should be consulted on the scope of any biological studies before they are undertaken.

In particular the following should be addressed:

- vegetation mapping for all relevant project sites including new transport infrastructure, and port facilities
- location, extent and conservation status of vegetation communities using the DERM regional ecosystem descriptions and in accordance with *The Conservation Status of Queensland's Bioregional Ecosystems.* (Sattler P.S. & Williams R.D., 1997)
- occurrence of plant species listed as protected plants under the *Nature Conservation (Wildlife) Regulation 1994;*
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected area estate
- any plant communities, species or significant individuals, within the project area, of cultural, commercial or recreational significance
- location and abundance of any exotic or weed species.

Within each defined (standard system) vegetation community, three sites (a minimum of at least one site) should be surveyed for plant species, preferably in both pre- and post-wet season conditions, as follows:

- site data should be recorded in a form compatible with the Queensland Herbarium CORVEG database
- the minimum site size should be 20 metres by 50 metres
- a complete list of species present at each site should be recorded
- the relative abundance of plant species present should be recorded
- any plant species of conservation, cultural, commercial or recreational significance should be identified
- specimens of species listed as protected plants under the *Nature Conservation (Wildlife) Regulation 1994*, other than common species, are to be submitted to the Queensland Herbarium for identification and entry into the HERBRECS database.

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

Fauna

The terrestrial and riparian fauna occurring in the areas affected by the project should be described, noting the broad distribution patterns in relation to vegetation, topography and substrate.

The description of the habitats and fauna present or likely to be present in the area should include:

- known areas which support species that are listed under JAMBA and CAMBA such as mangroves, saltpan, salt marsh, foredune and saltwater couch grassland
- upstream habitat and roost sites of the great egret, cattle egret and sacred ibis located in the tall mangroves along the southern bank of the Ross River estuary about 600 m upstream of the proposed site
- species diversity (i.e. a species list) and abundance of animals, including amphibians, birds, reptiles and mammals
- the value of migratory shore birds of areas proposed to be impacted by the proposal at the regional, state, national and international level should be identified, together with identification of the potential impacts. Specific investigation should be afforded to the little tern (*Sternula albifrons*)' which is known to breed on the Ross River mouth sand bar
- how disturbance/use by rodent species, dogs and cats of dunal/sand bar areas, which are known to potentially provide habitat for migratory species, will be prevented. These sand bars are likely disconnected from the coast
- information relating to habitat enhancement for migratory shore birds where this can be shown possible may be provided. Techniques used must reply on detailed geomorphic studies and proven case studies where they exist. Habitat enhancement will not be viewed by the DERM as a substitute for habitat protection and threat mitigation
- any species which are poorly known but suspected of being rare or threatened
- international significance of the area in terms of relative proportion of total East Asian-Australasian flyway populations of great knot, greater sand plover and red-necked stint
- 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)
- use of the area by migratory birds, nomadic birds, fish and terrestrial fauna.

The EIS should indicate how well any affected communities are represented and protected elsewhere in the region where the site of the project occurs. The description of environmental values should be based on a threatened and migratory bird species survey undertaken in accordance with relevant DERM guidelines.

3.8.2.2 Potential impacts and mitigation measures

The function of this section is to define potential adverse and beneficial impacts associated with the project and describe the objectives for protecting or enhancing nature conservation environmental values, to describe 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.

Construction and operation of the project involving clearing, salvaging or removal of vegetation should be described, and indirect impacts on vegetation not cleared should be discussed.

Impacts during construction and operation of the project should be assessed. Short-term and long-term durations should be considered.

Strategies for protecting any rare or threatened species should be described, and any obligations imposed by state or commonwealth endangered species legislation or policy or international obligations (i.e. JAMBA and CAMBA) should be discussed.

Habitat loss and alteration should be quantified and a description of its potential to impact on the decline of shorebird populations be discussed.

Measures to mitigate the impact on habitat or the inhibition of normal movement, propagation or feeding patterns, and change to food chains should be described. Any provision for buffer zones and movement corridors, or special provisions for migratory, nomadic and aquatic animals should be discussed where appropriate.

Measures to mitigate the impacts of the project on vegetation types identified as having high conservation values, listed species and sensitive habitat or the inhibition of propagation should be described. This should also include the identification of potential offset areas, in an 'offset strategy' to compensate for any loss of vegetation in accordance with the *Queensland Government Environmental Offsets Policy*.

The provision of buffer zones and movement corridors, and strategies to minimise environmental harm on migratory and nomadic animals should be discussed. The known arrival and leaving times of migratory species to the area should be considered in the development of the construction management plan to time construction activities accordingly to possibly reduce potential impact.

With regard to terrestrial flora the assessment of potential impact should consider:

- the significance of impacts at a local, catchment, bioregional, state or national levels
- impact on any plants of potential or recognised environmental or economic significance
- a discussion of the ability of identified stands of vegetation to withstand any increased pressure resulting from the project and identify measures proposed to mitigate impacts
- a description of the methods to ensure rehabilitation of disturbed areas following construction, including the species chosen for revegetation which should be consistent with the surrounding associations. Details of any post-construction monitoring programs and what benchmarks would be used for review of monitoring should be included.

With regard to terrestrial and riparian fauna, the assessment of potential impact should consider:

- loss of habitat – mangroves, grassland, saltpan and inter-tidal mud flats – these habitats will be quantified and assessed during the EIS
- displacement – the sandbar and tidal habitat is considered to be a valuable roosting site, as is the adjacent egret roosting site – these habitats may be altered
- threatening processes leading to progressive loss
- measures to minimise wildlife capture and mortality during construction and operation.

Pest management

Weed control strategies aimed at containing existing weed species (e.g. parthenium and other noxious weeds) and ensuring no new invasive weeds are introduced to the area are required. The study should develop strategies to ensure that the project does not contribute to increased encroachment of a weed species, including:

- identification of the origin of construction materials, machinery and equipment
- the need for vehicle and machinery wash-down and any other hygiene protocols
- staff/operator education programs
- determination of the potential for the introduction of or facilitation of exotic, non-indigenous and noxious plants.

The EIS should develop strategies to ensure that the project does not contribute to increased encroachment of feral animal species.

The EIS should include a review of control measures to prevent increases in local populations and spread of biting insect species of pest and health significance associated with construction activities and disposal of construction wastes.

Strategies for weed control, biting insects and feral animal management 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 environmental management plan. This should be developed in consultation with local government environmental officers, to cover construction, rehabilitation and operation periods. Reference should be made to the local government authority's pest management plan when determining control strategies.

3.8.3 Aquatic ecology

3.8.3.1 Description of environmental values

The function of this section is to describe the existing environment values for aquatic ecosystems that may be affected by the project in the context of environmental values as defined by the EP Act and Environmental Protection Policies, and the NC Act.

Describe the environmental values of aquatic ecosystems 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
- aquatic ecosystems.

Flora

The aquatic flora occurring in the areas affected by the project should be described, noting the patterns and distribution in the fresh and marine water. The description of the flora present or likely to be present in the area should include:

- aquatic plants (freshwater and marine)
- seagrasses
- mangroves
- rocky shore habitats
- aquatic substrate and stream type
- downstream habitat.

Define the nature and extent of existing marine features such as littoral and sub-littoral lands, waterways, affected tidal and sub-tidal lands, corals and marine vegetation (e.g. salt couch, seagrass and mangroves) within the proposed area of development and in the areas adjacent to the project.

Field assessments should be conducted for plant species, preferably in both pre- and post-wet season conditions, as follows:

- site data should be recorded in a form compatible with the Queensland Herbarium CORVEG database

- a complete list of species present at each site should be recorded, including those defined and protected under the *Fisheries Act 1994*
- the relative abundance of plant species present should be recorded
- any plant species of conservation, cultural, commercial or recreational significance should be identified
- specimens of species listed as protected plants under the *Nature Conservation (Wildlife) Regulation 1994*, other than common species, are to be submitted to the Queensland Herbarium for identification and entry into the HERBRECS database.

Fauna

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

Field surveys should be undertaken where necessary to identify:

- 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, their recreational, traditional and commercial fisheries interest identified and their present abundance and distribution assessed
- 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 Australian snubfin dolphin and the Indo-Pacific humpback dolphin) and whales.

The description of the above aquatic species present or likely to be present in the area should include:

- species distribution
- conservation status
- habitat and breeding
- threats.

Turtles

The turtle species which may be utilising beaches in proximity to the proposed development area should be described. Monitoring of turtle nesting along beaches proximate to the proposed port facilities should be undertaken for the duration of the turtle nesting seasons for turtle species occurring in the area.

A desktop review of information on the turtle communities of the study area, particularly the green, hawksbill, loggerhead, olive ridley and flatback turtles, should be undertaken with specific attention paid to any anecdotal or recorded information on turtle populations frequenting the port area and any known nesting sites.

Reference should be made to studies of the turtle populations in Cleveland Bay carried out by the James Cook University Sea Turtle Foundation and the DERM should be consulted on historical data for the area, in particular in relation to previously conducted nesting surveys.

This information shall be used to establish the basis for recommendations in relation to the most appropriate management measures to be adopted in order to minimise the risk of turtle injury or death. Particular reference to the protection of turtles from boat strike given the potential increase in boat traffic closer to feeding grounds than the existing port channel.

Sea floor habitat and benthic macroinvertebrates

A review of recently completed survey work by DEEDI (formerlyDPI&F) should be undertaken to determine the need for any additional works. Benthic macroinvertebrate communities likely

to be directly or indirectly impacted by the project should be characterised and an assessment made as to the adequacy of available information for the assessment of the potential impacts of dredge, reclamation and construction of the breakwater walls. The effect of ongoing maintenance dredging on the benthic fauna should also be considered.

3.8.3.2 Potential impacts and mitigation measures

The function of this section is to define potential adverse and beneficial impacts associated with the project and describe the objectives for protecting or enhancing nature conservation environmental values, to describe 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.

Strategies for protecting any rare or threatened species should be described, and any obligations imposed by state or Australian endangered species legislation or policy or international treaty obligations (i.e. Japan-Australia Migratory Birds Agreement, China-Australia Migratory Birds Agreement) should be discussed.

An intertidal habitat assessment should be conducted so that there is sufficient detail to determine the spatial distribution of the resource as feeding habitat for dependent fauna. There should be discussion on the potential impacts on other fauna such as shorebirds, sharks and rays, not only of the loss of physical habitat but of the value of the food resource within and adjacent to the site.

Recognised subject matter experts should be consulted with when preparing any sampling methodology. This should be done prior to conducting any further field studies.

Specific issues to be addressed associated with aquatic ecology include:

- assessment of the impact of loss of tidal flats on juvenile and adult aquatic species leading to loss of productivity in fish, crustaceans etc.
- describe the loss of seagrasses in relation to the extent and regional significance of seagrass communities and associated impact on fisheries, dugongs, turtles etc.
- discuss the impact of the creation of the marina and the likely colonisation of the marina and marine structures, including the breakwaters which may partially offset the adverse impacts of the development on marine biodiversity. Discuss the design of the marina and breakwaters in relation to the DEEDI (formerly DPI&F) *Guideline FHG0006: Fisheries Guidelines for Fish Friendly Structures* and where appropriate, demonstrate fish friendly design features of the proposed infrastructure
- discuss the potential impact of marine structures (whether temporary during construction or permanent) that may impair the movement of fish. Where waterway barrier works are proposed, these are to be described and mapped and will require approval under the *Fisheries Act 1994*
- the potential increased threat of introduced marine pests from vessels
- potential impacts associated with dredging and dredge material disposal
- benefits and/or disadvantages to recreational and commercial fishers resulting from provision of infrastructure or other aspects of the proposal
- describe mitigation measures to reduce the impacts on the Australian snubfin dolphin, Indo-Pacific humpback dolphin, turtles and dugongs related to increased recreational and commercial use (i.e. boat strike, degraded water quality)
- proposed offsets to deal with any permanent losses of fisheries habitat values from the project should be detailed in accordance with the DEEDI (formerly DPI&F) policy *FHMOP 005: Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss*.

3.9 Air quality

3.9.1 Description of environmental values

This section of the EIS should describe the existing air quality that may be affected by the project in the context of environmental values as defined by the EP Act and *Environmental Protection (Air) Policy 2008*.

Describe the environmental values of the air shed for the affected area in terms of the Environmental Protection (Air) Policy. A description of the existing air shed environment should be provided having regard for particulates, gaseous and odorous compounds. The background levels and sources of suspended particulates, SOx, NOx, and any other major constituent of the air environment, including greenhouse gases which may be affected by the project should be discussed.

Sufficient data on local meteorology and ambient levels of pollutants should be gathered to provide a baseline for later studies or for the modelling of air quality environmental harms within the airshed.

Parameters should include air temperature, wind speed and direction, atmospheric stability, mixing depth and other parameters necessary for input to the models.

3.9.2 Potential impacts and mitigation measures

The function of this section is to define potential adverse and beneficial impacts associated with the project and describe the objectives 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.

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 airshed, and the likely environmental harm from any such interaction, should also be detailed.

The proposed levels of emissions should be compared with the current national environmental protection measures for ambient air quality, and the Environmental Protection (Air) Policy . Where these policies do not identify an objective for a pollutant proposed to be emitted by the project, other relevant legislation, standards and/or guidelines should be used.

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 at any residential, industrial developments believed to be sensitive to the effects of predicted emissions. The techniques used to obtain the predictions should be referenced, and key assumptions and data sets explained.

Greenhouse gas emissions

A full assessment of greenhouse gas emissions from the project should be provided including:

- an inventory of proposed future annual emissions for each greenhouse gas and total emissions expressed in 'CO_2 equivalent' terms for each component of the project and for the combined total project
- methodologies by which estimates were made
- opportunities for offsetting greenhouse gas emissions, such as through forestry plantations, investing in renewable energy projects, purchase of renewable energy or support for relevant research.

The above assessment should be undertaken with due consideration of relevant protocols, agreements and strategies including:

- National Greenhouse Strategy
- National Greenhouse Gas Inventory
- Kyoto Protocol
- Framework Convention on Climate Change
- Queensland Government Energy Policy
- Queensland Implementation Plan
- voluntary programs under the Australian Greenhouse Office.

Greenhouse gas abatement

A description of proposed actions and measures for greenhouse gas abatement should be included, describing the following:

- specific actions and commitments taken to avoid and minimise emissions and maximise the amount of CO_2 sequestered
- provision for regular greenhouse audits
- a process for continuous review of best practice to identify opportunities to maximise the greenhouse benefits of the project and improve energy efficiency
- benchmarking against other similar or comparable facilities to indicate whether the most efficient technologies are being adopted
- consideration of any additional voluntary initiatives consistent with the strategies outlined in the National Greenhouse Strategy.

3.10 Noise and vibration

3.10.1 Description of environmental values

The function of this section is to describe the existing environment values that may be affected by noise and vibration from construction, operation and maintenance activities in the context of environmental values as defined by the EP Act and Environmental Protection Policies.

The results of any baseline monitoring of noise and vibration in the proposed vicinity of the project should be described. Baseline monitoring should include a selection of sensitive areas affected by the project.

Sufficient data should be gathered to provide a baseline for later studies. The daily variation of background noise levels at nearby residences should be monitored and reported in the EIS monitoring methods should adhere to relevant DERM (formerly EPA) guidelines or Australian Standards and any relevant requirements of the *Environmental Protection (Noise) Policy 1997*.

Comment should be provided on any current activities near the project area which may cause a background level of ground vibration. Detail the environmental values of noise for the affected area in terms of the Environmental Protection (Noise) Policy.

3.10.2 Potential impacts and mitigation measures

The function of this section is to define potential adverse and beneficial impacts associated with the project and describe the objectives for protecting or enhancing environmental values from impacts by noise and vibration, to describe 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 potential environmental harm of noise and vibration at all potentially sensitive places, in particular, any place of work or residence should be quantified in terms of objectives, standards and indicators to be achieved. This should also include environmental harm on terrestrial and marine animals and birds particularly migratory species. Proposals to minimise or eliminate these effects including details of any screening, lining, enclosing or bunding should be provided. Timing schedules for operations should be discussed, with respect to minimising environmental harm, including environmental nuisance from noise.

3.11 Waste management

3.11.1 Description of environmental values

The function of this section is to describe the existing environmental values that may be affected by wastes generated by the project in the context of environmental values as defined by the EP Act and Environmental Protection Policies.

State how any environmental values are affected by the management of wastes proposed. Refer to each of the wastes streams identified in section 2.5.8 and any links to environmental values described in section 3 of this TOR.

Provide an inventory of all wastes generated by the project through construction, and operation. The physical and chemical characteristics of waste material should be provided. All other wastes, including regulated wastes, generated by the project should be described, e.g. tyres, packaging materials etc, and best practice waste management strategies and the *Environmental Protection (Waste Management) Policy 2000.*

Having regard for the *Environmental Protection (Waste Management) Policy 2000*, the EIS should indicate the results of investigation into the feasibility of using waste minimisation and cleaner technology options during all phases of the proposal. The DERM (formerly EPA) has also released draft guidelines covering aspects of waste management under this environmental protection policy, which should be addressed.

3.11.2 Potential impacts and mitigation measures

The function of this section is to define potential adverse and beneficial impacts associated with the project and describe the objectives for protecting or enhancing environmental values from impacts by wastes, to describe 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.

3.12 Cultural heritage

3.12.1 Description of environmental values

The function of this section is to describe the existing environment values for cultural heritage that may be affected by the project.

In accordance with the *Queensland Heritage Act 1992* and the *Aboriginal Cultural Heritage Act 2003*, a cultural heritage study may be required, which will describe indigenous and non-indigenous cultural heritage sites and places and their values. Such a study must be conducted by an appropriately qualified cultural heritage practitioner and must include the following:

- liaison with relevant indigenous community/communities concerning places of significance to that community (including archaeological sites, natural sites, story sites etc.
- appropriate community involvement in field surveys
- a systematic survey of the proposed development area to locate and record indigenous and non-indigenous cultural heritage places
- significant assessment of any cultural heritage sites/places located

- the impact of the proposed development on cultural heritage values
- a report of work done which includes background research, relevant environmental data and methodology, as well as results of field surveys, significance assessment and recommendations
- any permits to conduct the research and survey required under the provisions of the *Queensland Heritage Act 1992* and the *Aboriginal Cultural Heritage Act 2003*.

3.12.2 Potential impacts and mitigation measures

The function of this section is to define and describe the objectives for protecting or enhancing cultural heritage values, to describe 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 impacts to cultural heritage values within and in the immediate vicinity of the project area should be managed under a cultural heritage management plan (CHMP) developed specifically for the project.

Indigenous cultural heritage issues within the CHMP should be addressed in accordance with the NRW *Cultural Heritage Management Plan Guidelines* (2005) (refer to Part 7 of the *Aboriginal Cultural Heritage Act 2003*) and with reference to the NRW *Aboriginal Cultural Heritage Duty of Care Guidelines* (2004).

The CHMP should address and include the following:

- a process for including Indigenous people associated with the development areas in the 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 any cultural material
- the monitoring of foundation excavations and other associated earthwork activities for possible sub-surface cultural material
- cultural awareness training or programs for project staff
- a conflict resolution process.

3.13 Health and safety

3.13.1 Description of environmental values

The function of this section is to describe the existing community values for health and safety that may be affected by the project activities in the context of environmental values as defined by the EP Act and Environmental Protection Policies.

The values of the health and safety of the community, workforce, suppliers and other stakeholders should be detailed in terms of the environmental factors that can affect human health, public safety and quality of life, such as air pollutants, odour, dust, noise and water.

3.13.2 Potential impacts and mitigation measures

The function of this section is to define and describe the objectives for protecting or enhancing health and safety community values, to describe how nominated quantitative standards and indicators may be achieved for health and safety impacts management, and how the achievement of the objectives will be monitored, audited and managed.

The EIS should assess the effects on project workforce of occupational health and safety risks and impacts on the community in terms of health, safety, and quality of life from project operations and emissions.

Measures to control mosquito and biting midge breeding need to be described.

Practical monitoring regimes should also be recommended in this section.

3.14 Cumulative impacts

The purpose of this section is to provide clear and concise information on the overall impacts of the project, and to discuss the interrelationship of these impacts. This is in addition to the discussion of cumulative impacts which feature in the relevant sections. The cumulative impacts as they relate to particular issues (e.g. water management, cultural heritage, social etc.) may also be discussed in this section. These impacts should be considered over time or in combination with other impacts because of the scale, intensity, duration or frequency of the impacts.

Cumulative impacts should also take into consideration other infrastructure projects. In particular, the requirements of any relevant State Planning Policies, Environmental Protection Policies, national environmental protection measures, water resource planning and any other relevant plans should be addressed.

The methodology to be used to determine the cumulative impacts of the project should be discussed. The methodology should detail the range of variables to be considered including, where applicable, relevant baseline or other criteria upon which the incremental aspects of the project should be assessed.

4. Social values and management of impacts

4.1 Description of existing social values

This section describes the existing social values that may be affected by the proposal.

The social amenity and use of the proposal area and adjacent areas for 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
- Indigenous peoples' traditional and contemporary uses of the land affected by the project.

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.

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 3.12 Cultural heritage and section 5 Impacts on state and local economies, and management of those impacts.

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

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

4.2 Potential impacts and mitigation measures

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

The social impact assessment of the project should consider the information gathered in the community consultation program and the analysis of the existing socio-economic environment, and describe the project's impact, both beneficial and adverse, on the local

community. The impacts of the project on local and regional residents, community services and recreational activities are to be analysed and discussed for all stages of the development. The nature and extent of the community consultation program are to be described and a summary of the results incorporated in the EIS.

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

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

The EIS should address the following matters:

- impacts on local residents, current land uses and existing lifestyles and enterprises. Reference should to be made to the potential relocation of marine enterprises from upstream in the Ross River and in Ross Creek to the marine precinct and resulting social implications, and the potential for provision of community infrastructure
- 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. In relation to the source of the workforce, information is required as to whether the proponent and/or contractors are likely to employ locally or through other means and whether there are initiatives for local employment opportunities
- impacts of both construction and operational workforces and associated contractors on housing demand, community services and community cohesion. The capability of the existing housing stock, including rental accommodation, to meet any additional demands created by the project is to be discussed, and where appropriate mitigation strategies proposed to limit displacement of existing rental households
- relevant demographic, social, cultural and economic profiles
- identify any new skills and training to be introduced in relation to the project. 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
- identify 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 existing local residents' values and aspirations
- 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
    - the new project workforce and their families.
- for the construction and operational phases of the development, describe the effects of the proposal on local and regional residents
- potential environmental harm on the amenity of adjacent areas and describe the implications of the proposal for future developments in the local area including constraints on surrounding land uses.

The relocation and decommissioning of existing marine industry activities to the marine precinct and the subsequent redevelopment of the vacated land is likely to have impacts on adjacent areas. These may include positive outcomes such as the potential for provision of community infrastructure or amenity. The likely form of redevelopment of these sites should be identified and evaluated where possible including a discussion of public benefits and the process for managing any adverse impacts.

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.

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

5. Impacts on state and local economies and management of those impacts

5.1 Description of existing economic character

This section describes the existing economic environment that may be affected by the project.

The character and basis of the local and regional economies should be described including:

- economic viability (including economic base and economic activity, future economic opportunities, current local and regional economic trends)
- identification of existing labour force and unemployment statistics
- existing housing market, particularly rental accommodation which may be available for the project workforce
- existing marine industries currently located within the immediate area
- the commercial fishing fleet located upstream of the project site in the Ross River
- types and numbers of businesses
- existing property and land values
- availability and prices of goods and services
- availability of suitable land for support industrial uses.

The economic impact statement should include estimates of the opportunity cost of the project and the loss of value to ecosystem services as a result of the disturbance or removal of natural or modified ecosystems during development.

5.2 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.

An economic impact assessment 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. Particular reference is to be made to the potential relocation of marine enterprises and commercial fishing operations to the marine precinct and the resulting economic implications.

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

- the significance of this proposal on the local and regional economic context
- economic impacts on the existing marine industries and the commercial fishing fleet that may potentially relocate to the marine precinct including:
    - capital expenditure and operating costs
    - additional costs associated with the proposed staged construction
    - constraints or opportunities that may affect operational efficiencies or capability for expansion
- the long and short-term beneficial (e.g. job creation) and adverse (e.g. competition with local small business) impacts that are likely to result from the development

- the potential, if any, for direct equity investment in the project by local businesses or communities
- the cost to all levels of government of any additional infrastructure provision
- implications for future development in the locality (including constraints on surrounding land uses and existing industry)
- the potential economic impact of any major hazard identified in section 6 Hazard and risk
- the distributional effects of the proposal including proposals to mitigate any negative impact on disadvantaged groups
- the value of lost opportunities or gained opportunities for other economic activities anticipated in the future
- impacts on local property values.

The effect on local labour markets should be discussed with regard to the number and source of the workforce. This information should be presented according to occupational groupings of the workforce and show anticipated peaks in numbers during the construction period. This information should include an estimate of the anticipated numbers of workers who will be accompanied by dependents, as well as those who will be unaccompanied (i.e. single workers).

The impacts of both construction and operational workforces and associated contractors on housing demand should be addressed and include:

- an accommodation strategy for the construction workforce, which addresses the estimated housing needs of both single and accompanied construction workers
- details of the size, location and management of any temporary worker accommodation that will be required either on-site or off-site
- maps, as necessary, to illustrate the location of any proposed construction workers' accommodation on-site or in the vicinity of the project
- the capability of the existing housing stock, particularly rental accommodation, to meet any additional demands created by the project.

Any new skills and training to be introduced in relation to the project should be identified, particularly opportunities for private investment in training. Adequate provision should be made for apprenticeship and worker training schemes, including consideration of a skills development and training strategy to assist disadvantaged groups as well as local residents.

Attention should be directed to the long and short-term effects of the project on the land-use of the surrounding area and existing industries, regional income and employment and the state economy. The scope of any studies should be referred to the government for input before undertaking the studies.

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

6. Hazard and risk

6.1 Hazard and risk assessment

This section of the EIS should describe the potential hazards and risks that may be associated with the project and should incorporate all known hazards, which may include:

- identification of potential hazards, accidents, spillages and abnormal events occurring during all stages of the project, including possible frequency of occurrence
- indication of cumulative risk levels to surrounding land uses
- identification of all hazardous substance to be used, stored, processed or produced and the rate of usage
- potential wildlife hazards such as snakes and disease vectors.

The EIS should deal with on-site risks as well as external risks to the project. External risks from natural hazards could be determined on the basis of Australia/New Zealand Standard *AS/NZS 4360:2004 Risk Management*. The study should assess risks during the construction, operational and decommissioning phases associated with the project. These risks should be assessed in quantitative terms where possible. Possible hazards, accidents, and abnormal events that may arise for the project, both during construction and in operation should be described, including:

- accidental release of hazardous goods or other materials
- fires associated with incidents arising from the project activities
- vulnerability of the project area to flooding and storm surge and other natural disasters.

Analysis of the consequences of each of these events on safety and environmental damage in the project area should be conducted, including direct harm to the environment as a result of project hazards. The analysis should examine the likelihood of these consequences being experienced, both individually and collectively.

Details should be provided on the safeguards that would be employed or installed to reduce the likelihood and severity of hazards, consequences and risks to persons, fauna and environmentally sensitive sites within and adjacent to the project area.

6.2 Emergency management plan

An outline of the proposed emergency management procedures should be provided for the range of situations identified in the above risk assessment where there are measurable risks. This should include an overview of the objectives and management principles to be adopted for the preparation of a detailed emergency plan (including emergency response and recovery/cleanup procedures) in consultation with the relevant emergency services. Planning should include reference to State Planning Policy 1/03: *Mitigating the Adverse Impacts of Flood, Bushfire and Landslide.*

In particular, the following should be presented:

- contingency plans to deal with hydrocarbons (e.g. diesel, lubricating oils etc.) oil spills during construction, operation and maintenance of the project
- contingency plans to account for natural disasters such as storms, flooding and fires during the construction, operation and maintenance phases
- emergency planning and response procedures that have been determined in consultation with state and regional emergency service providers (including the Queensland Police Service and the Department of Community Safety)

- plans for involvement of the relevant state agencies (including the Department of Community Safety, which includes the Queensland Ambulance Service, Queensland Fire and Rescue Service and Emergency Management Queensland) in relation to emergency medical response and transport and first aid matters.

7. Matters of national environmental significance

The controlling provisions under the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)* (EPBC Act) have been determined as:

- Sections 12 and 15A (World Heritage properties)
- Sections 15B and 15C (national heritage place)
- Sections 16 and 17B (wetlands of international importance)
- Sections 18 and 18A (listed threatened species and communities)
- Sections 20 and 20A (listed migratory species).

This section should bring together assessments of impacts on matters of national environmental significance in other chapters (e.g. water resources, flora and fauna, cultural heritage and cumulative impacts etc.) and produce a stand-alone assessment in a format suited for assessment under the EPBC Act.

The project should initially be assessed in its own right followed by an assessment of the cumulative impacts related to all known proposed marine developments in the Townsville region with respect to each controlling provision and all identified consequential actions. Cumulative impacts not solely related to marine development should also be assessed.

Predictions of the extent of threat (risk), impact and the benefits of any mitigation measures proposed, should be based on sound science and quantified where possible. All sources of information relied upon should be referenced and an estimate of the reliability of predictions provided. Any positive impacts should also be identified and evaluated.

The extent of any new field work, modelling or testing should be commensurate with risk and should be such that when used in conjunction with existing information, provides sufficient confidence in predictions that well informed decisions can be made.

7.1 Impacts on World Heritage Areas and National Heritage places

The EIS should provide identification and description of the characteristics and values of the Great Barrier Reef World Heritage Area and National Heritage places, that are likely to be impacted by the project. Values include but are not restricted to, erosion and deposition processes along the coastline, marine flora and fauna communities, including coral and benthic communities, saltmarsh, seagrass, and mangroves, species of conservation significance and the significant regional habitat for listed threatened and migratory species.

The potential direct, indirect and consequential impacts on Great Barrier Reef World Heritage Area resulting from:

- modification, destruction, fragmentation, isolation or disturbance of an important or substantial area of habitat
- a substantial change in water quality (including temperature) which may adversely impact on biodiversity, ecological integrity, social amenity or human health
- persistent organic chemicals, heavy metals, or other potentially harmful chemicals accumulating in the marine environment such that biodiversity, ecological integrity, social amenity or human health may be adversely affected
- impacts on other users of the area
- the potential impacts on important amenities, navigation, culturally and historically significant sites, threatened or migratory species or sensitive habitats

- the extent to which impacts can be forecasted or predicted and management
- a substantial and measurable change in the hydrological regime of the Great Barrier Reef World Heritage Area waters, for example a substantial change to the volume, timing, duration and/or frequency of ground and surface water flows to the marine park
- the potential visual impacts
- a substantial and measurable change in the water quality of the Great Barrier Reef World Heritage Area waters, for example, a substantial change in the level of salinity, pollutants, pesticides or nutrients in the Great Barrier Reef World Heritage Area
- loss or modification of in stream habitat important for species important to the values of the Great Barrier Reef World Heritage Area (including fragmentation, altered land use, fire regimes, altered nutrient cycle, altered hydrological cycles etc.).

A description of any mitigation and management measures proposed to protect or enhance impacts on the Great Barrier Reef World Heritage Area should be discussed within the EIS.

7.2 Wetlands of international importance

For wetlands of international importance, the EIS should provide relevant discussion concerning potential impacts, including:

- description of the location, extent and ecological characteristics and values of those wetland that are potentially affected by the project
- areas of the wetland being destroyed or substantially modified
- substantial and measurable changes to the hydrological regime of the wetlands, for example a substantial change to the volume, timing, duration or 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 effected
- substantial and measurable change in the water quality of the wetlands – 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
- invasive species that may be harmful to the ecological character of the wetlands, if introduced to or spread in the wetland.

A description of any mitigation measures proposed to protect or enhance impacts on the Bowling Green Bay Ramsar site should be discussed within the EIS.

7.3 Impact on a listed threatened species and ecological communities

A description of the listed threatened species and ecological communities identified below (including EPBC Act status, distribution, life history, habitats etc.).

The EIS should consider and assess the impacts to the listed threatened species and ecological communities and any others that are found to be or may potentially be present in areas that may be impacted by the project. The EIS should identify which component of the project is of relevance to each species or community or if the threat of impact relates to consequential actions, resulting from:

- decrease in the size of a population or a long term adverse affect on an ecological community
- reduction in the area of occupancy of the species or extent of occurrence of the ecological community

- fragmentation an existing population or ecological community
- disturbance or destruction of habitat critical to the survival of the species or ecological community
- disruption of the breeding cycle of a population
- modification, destruction, removal, isolate or reduction of the availability or quality of habitat to the extent that the species is likely to decline
- modification or destruction of abiotic (non-living) factors (such as water, nutrients or soil) necessary for the ecological community's survival
- the introduction of invasive species that are harmful to the species or ecological community becoming established
- interference with the recovery of the species or ecological community
- action which may be inconsistent with a recovery plan.

Any positive impacts should also be identified and evaluated.

A description of any mitigation measures proposed to reduce the impact on the listed threatened species and ecological communities and the anticipated benefit of proposed mitigation measures should be discussed within the EIS.

List of potential listed threatened species and their status:

Reptiles (including turtles)

- loggerhead turtle (*Caretta caretta*)–endangered
- green turtle (*Chelonia mydas*)–vulnerable
- Yakka skink (*Egernia rugosa*)–vulnerable
- hawksbill turtle (*Eretmochelys imbricata*)–vulnerable
- Pacific ridley turtle, olive ridley turtle (*Lepidochelys olivacea*)–endangered
- flatback turtle (*Natator depressus*)–vulnerable

Birds

- red goshawk (*Erythrotriorchis radiatus*)–vulnerable
- squatter pigeon (*Geophaps scripta scripta*)–vulnerable
- star finch (eastern and southern) (*Neochmia ruficauda ruficauda*)–endangered
- black-throated finch (*Poephila cincta cincta*)–endangered
- Australian painted snipe (*Rostratula australis*)–vulnerable

Mammals

- humpback whale (*Megaptera novaengliae*)–vulnerable
- water mouse, false water rat (*Xeromys myoides*)–vulnerable
- whale shark (*Rhincodon typus*)–vulnerable

7.4 Impact on a listed migratory species

A description of the listed migratory species identified below (including EPBC Act status, distribution, life history, habitats etc.).

The EIS should consider and assess the impacts to the listed migratory species identified below and any others that are found to be or may potentially be present in areas that may be impacted by the project. The EIS should identify which component of the project is of relevance to each species or if the threat of impact relates to consequential actions, resulting from:

- the destruction, isolation or modification of habitat important to a migratory species
- the introduction of invasive species in an important habitat that would be harmful to a migratory species
- the disruption of the lifecycle (breeding, feeding, migration, or resting behaviour) of an ecologically important proportion of the population of a migratory species
- interference with the recovery of the species or ecological community
- action which may be inconsistent with a recovery plan.

Any positive impacts should also be identified and evaluated.

A description of any mitigation measures proposed to reduce the impact on migratory species and the anticipated benefit of proposed mitigation measures should be discussed within the EIS.

List of potential migratory species:

Birds

- white-belled sea-eagle (*Haliaeetus leucogtaster*)
- barn swallow (*Hirundo rustica*)
- rainbow bee-eater (*Merops ornatus*)
- great egret, white egret (*Ardea alba*)
- cattle egret (*Ardea ibis*)
- lesser sand plover, Mongolian plover (*Charadrius mongolus*)
- Lathams snipe (*Gallinago hardwicki*)
- Australian cotton pygmy-goose (*Nettapus coromandelianus albipennis*)
- eastern curlew (*Numenius madagascariensis*)
- little curlew, little whimbrel (*Numenius minutus*)
- whimbrel (*Numenius phaeopus*)
- painted snipe (*Rostratula benghalensis*)
- fork-tailed swift (*Apus pacificus*)
- little tern (*Sterna albifrons*)

Mammals

- dugong (*Dugong dugong*)
- humpback whale (*Megaptera novaeangliae*)
- Australian snubfin dolphin (*Orcaella brevirostris*)
- killer whale (*Orcinus orca*)
- Indo-Pacific humpback dolphin (*Sousa chinensis*)

Reptiles (including turtles)

- estuarine crocodile, salt-water crocodile (*Crocodylus porosus*)
- green turtle (*Chelonia mydas*)

- hawksbill turtle (*Eretmochelys imbricate*)
- flatback turtle (*Natator depressus*)
- loggerhead turtle (*Caretta caretta*)
- Pacific ridley turtle, olive ridley turtle (*Lepidochelys olivacea*)

Fish

- whale shark (*Rhincodon typus*)

8. Environmental management plan

This section of the EIS should detail the environmental management plans developed for the project. Separate environmental management plans should individually address the discrete project elements. The environmental management plans should be developed from, and be consistent with, the preceding information in the EIS.

An environmental management plan should provide control actions in accordance with agreed performance criteria for specified acceptable levels of environmental harm.

In addition, the environmental management plans should identify:

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

The aims of the environmental management plans are to provide:

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

The recommended structure of each element of an environmental management plan is:

Element/issue:	Aspect of construction or operation to be managed (as it affects environmental values).
Operational policy:	The operational policy or management objective that applies to the element.
Performance criteria:	Measurable performance criteria (outcomes) for each element of the operation.
Implementation strategy:	The strategies, tasks or action program (to nominated operational design standards) that would be implemented to achieve the performance criteria.
Monitoring:	The monitoring requirements to measure actual performance (i.e. specified limits to pre- selected indicators of change).
Auditing:	The auditing requirements to demonstrate implementation of agreed construction and operation environmental management strategies and compliance with agreed performance criteria.
Reporting:	Format, timing and responsibility for reporting and auditing of monitoring results.
Corrective action:	The action (options) to be implemented in case a performance requirement is not reached and the person(s) responsible for action (including staff authority and responsibility management structure).

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

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

9. Conclusions and recommendations

The EIS should make conclusions and recommendations with respect to the project based on the studies presented, the environmental management plans and conformity of the project with legislative and policy requirements.

10. References

All references consulted should be presented in the environmental impact statement in a recognised format.

11. Recommended appendices

11.1 Final TOR for this EIS

A copy of the final TOR should be included in the EIS and a summary, cross-referencing specific items of the terms of reference to the relevant section of the EIS, should also be provided.

11.2 Development approvals

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

11.3 *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)* report

A report addressing matters of national environmental significance and potential impacts of the project should be presented.

11.4 Consultation report

A list of advisory agencies should be provided in a summary consultation report, which should also list the Australian, state and local government agencies consulted, and the individuals and groups of stakeholders consulted. A summary of the issues raised by these groups, and the means by which the issues have been addressed, should be provided in the text of the EIS.

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

Information about identifying affected parties (as defined by the EPBC Act) and interested and/or affected persons (as defined by the *Environmental Protection Act 1994 (Qld)*) should be included.

11.5 Study team

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

11.6 Glossary of terms

A glossary of technical terms and acronyms should be provided.

11.7 Specialist studies

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

- flora and fauna studies including the subregional analysis of representativeness and adequacy of protection for the terrestrial / riparian vegetation communities and their component flora and fauna taxa within the affected areas
- an integrated assessment of relative biodiversity and conservation values, based on the methodology outlined in the EPA *Biodiversity Assessment and Mapping Methodology* (2002)
- air pollution / quality, noise and vibration
- waterway hydrology
- groundwater
- geology and soil
- economic studies and/or cost-benefit analyses
- hazard and risk studies
- land use and land capability studies
- coastal hydrodynamics and sedimentation
- road impact assessment
- cultural heritage studies.

11.8 Corporate environmental policy

The proponent should attach a copy of its corporate environmental policy and planning framework document.

11.9 List of proponent commitments

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