The **Coordinator-General**

Townsville Port Expansion Project

Terms of reference for an environmental impact statement

February 2012

Queensland Government

Contents

Introduction

The Port of Townsville Limited (PoTL) is the proponent for the proposed expansion of the Port of Townsville Project (the project), located at the mouth of the Ross River in the City of Townsville.

The port expansion has been proposed to address current capacity constraints and accommodate forecast growth in trade at the port over a planning horizon to 2040, and is consistent with the future planning of the port as set out in the Port of Townsville, Land Use Plan (2010).

The Coordinator-General has declared the project to be a 'significant project' requiring an environmental impact statement (EIS) under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act).

The declaration of the project as a 'significant project' does not indicate support for, nor 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.

Terms of reference (TOR) set out the requirements, both general and specific, that the proponent should address in preparing the EIS. These TOR have been prepared having regard to comments and submissions received on the draft TOR released for public comment over the period of 29 October 2011 to 25 November 2011.

The TOR are divided into two parts:

- Part A—General information and administrative procedures (page 2)
- Part B—Contents of the EIS (page 10)

The Australian Government has determined that the project constitutes a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) (reference number EPBC 2011/5979) due to possible impacts on matters of national environmental significance, and is conducting a separate assessment process.

Part A General information and administrative procedures

1. Project summary

PoTL proposes an expansion of the Port of Townsville to accommodate forecast growth in trade at the port and to address current capacity constraints. The key components of the Townsville Port Expansion project include:

- constructing a new deep water outer harbour, by constructing a new breakwater approximately one kilometre seaward of the existing northern breakwater, and deepening the harbour area
- potentially constructing a new western breakwater to protect the outer harbour, depending on the results of further hydrodynamic modelling to be undertaken as part of the EIS
- constructing up to six additional vessel berths in the new harbour
- deepening the existing approach channels (the Sea and Platypus channels)
- widening the approach channel near the outer harbour entrance
- creating approximately 100 hectares of reclaimed land backing the new berths to provide for bulk cargo storage and rail loop, all formed from material reclaimed from the harbour deepening and from mainland sources. This will include internal bunds to facilitate effective land reclamation
- placing unsuitable and excess dredged material at sea in the approved dredge material placement area in Cleveland Bay
- installing new navigational aids
- constructing new road and rail infrastructure within the project footprint and connecting it to the Townsville eastern access corridor (EAC), currently under construction
- installing new services infrastructure.

Further information on the project can be viewed at:
http://projects.industry.qld.gov.au

2. Project proponent

PoTL is a Queensland Government Owned Corporation whose main function is the control and management of the Port of Townsville.

The contact details for the proponent are:

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Project Manager
Port of Townsville Limited
PO Box 1031
TOWNSVILLE QLD 4810

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3. Legislative framework

On 23 May 2011, the Coordinator-General declared the project to be a 'significant project' under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act). This declaration initiates the statutory environmental impact assessment procedure of Part 4 of the SDPWO Act, which requires the proponent to prepare an EIS for the project.

On the 1 July 2011, the delegate for the Commonwealth Environment Minister determined that the project is a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act), due to the likely potential impacts on matters of national environmental significance. The controlling provisions under the EPBC Act are:

- sections 12 and 15(a) (World Heritage properties)
- sections 15B and 15(c) (National Heritage places)
- sections 16 and 17(b) (wetlands of international importance)
- sections 18 and 18(a) (listed threatened species and communities)
- sections 20 and 20(a) (listed migratory species)
- sections 23 and 24A (Commonwealth marine areas)
- sections 24B and 24C (Great Barrier Reef Marine Park)

The project will therefore require approval from both the state and Australian governments before it can proceed.

On 21 July 2011, the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) advised that a separate assessment process will be undertaken for this project. The proponent will be required to prepare an EIS addressing both state and Commonwealth requirements (as recorded in the state's TOR and the Australian Government's Guidelines for an EIS, respectively). Following this, a separate assessment report will be completed by each jurisdiction.

It should be noted that this TOR only lists the Queensland Government's requirements.

3.1 State EIS process

The Department of Employment, Economic Development and Innovation (DEEDI) is managing the EIS process on behalf of the Coordinator-General. DEEDI has invited relevant Commonwealth, State and local government representatives, and other relevant authorities, to participate in the process as advisory agencies.

The first step in the impact assessment process is to develop TOR for an EIS for the project. The process involves formulating draft TOR and making them available for public and advisory agency comment. In finalising the TOR, the Coordinator-General considers all written comments on the draft TOR and gives copies of the comments to the proponent.

In accordance with section 32(1) of the SDPWO Act, the proponent must provide an EIS that addresses these TOR. The EIS must be acceptable to the Coordinator-General and be provided within two years of these TOR being finalised (unless the Coordinator-General grants an extension in writing, pursuant to section 32(4)(b) of the SDPWO Act).

Once the Coordinator-General accepts the EIS, the proponent must publicly notify its availability in regional and national newspapers, pursuant to section 33 of the SDPWO Act. The notice will state where copies of the EIS can be viewed or purchased, the submission period and where submissions should be sent. After reviewing the EIS, the Coordinator-General may also require the proponent to provide supplementary information to address specific matters raised during the EIS submission period, pursuant to section 35(2) of the SDPWO Act.

At the completion of the EIS phase, the Coordinator-General will prepare a report (Coordinator-General's report) evaluating the EIS and other relevant material, pursuant to section 35 of the SDPWO Act. The Coordinator-General's 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
- other submissions accepted by the Coordinator-General
- any other material the Coordinator-General considers relevant to the project (e.g. a supplementary report to the EIS, comments and advice from advisory agencies and other entities and technical reports).

The Coordinator-General's report will be publicly notified by placing it on the website at **http://projects.industry.qld.gov.au** The report will also be presented to the proponent, the assessment manager under the *Sustainable Planning Act 2009* (Qld) (SPA) and the Australian Government Minister for the Environment, if relevant.

If the project requires an application for a development approval under SPA, the Coordinator-General's report may, under section 39 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 a preliminary approval only.

Alternatively, under section 39(2) of the SDPWO Act, the Coordinator-General's report must state for the assessment manager that:

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

Further, the report must:

- give reasons for the statements (above)
- be given to the assessment manager for the application by the Coordinator-General.

Further to SPA approvals noted above, other approvals or resource allocations are likely to be required under the following*: Coastal Protection and Management Act 1995; Environmental Protection Act 1994,Fisheries Act 1994; Land Act 1994;* and the *Transport Operations (Maritime Safety) Act 1994.*

Note: It is the responsibility of the proponent (or its consultants) to address the requirements of new or amended legislation or policies that come into effect after these TOR have been finalised. This requirement applies regardless of whether or not the legislation or policies are covered in these TOR.

4. 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 that adverse impacts are 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.

4.1 Audience for EIS

The EIS document should provide information for the following persons and groups, as the project stakeholders:

- **for interested bodies and persons—**a basis for understanding the project, prudent and feasible alternatives, affected environmental values, impacts that may occur and the measures to be taken to mitigate all adverse impacts
- **for affected persons—**that is, groups or persons with rights or interests in land, as defined under section 38 of the EP Act, or water as defined under the *Water Act 2000* (Qld)—an outline of the effects of the proposed project
- **for government agencies and referral bodies—**a framework for decision-makers to assess the environmental aspects of the proposed 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, subject to what conditions, if any
- **for the proponent—**a mechanism by which the potential environmental impacts of the project are identified and understood, including information to support the development of management measures, such as an environmental management

plan (EMP), to mitigate the effects of adverse environmental impacts of the development.

The proponent is required to address the TOR to the satisfaction of the Coordinator-General before the EIS is made publicly available.

5. EIS guidelines

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 main EIS report needs to be supported by appendices containing relevant data, technical reports and other sources of the EIS analysis. In preparing the EIS, the proponent must:

- use scientific and/or specialist studies to predict environmental impacts and provide details of their methodology, reliability, and any relevant assumptions or scientific judgements
- present all technical data, sources or authority and other information used to assess impacts
- describe and evaluate proposed measures to mitigate and manage identified issues
- describe qualitatively (in as much detail as reasonably practicable) the residual impacts that are not quantifiable
- discuss the criteria adopted in assessing the proposed project and its impacts (e.g. compliance with relevant legislation, policies, standards, community acceptance). Reference should be made to Schedule 4 of the Environmental Protection Act 1994 (EP Act).
- ensure the level of investigation of potential/uncertain impacts on the environment is proportionate to both the severity and the likelihood of those events occurring
- adequately address issues that may emerge during the investigations and preparation of the EIS, undertaking the necessary studies and reporting the results
- address all relevant matters concerning environmental values, impacts and proposed mitigation measures for the first time in the main text of the EIS and not in an appendix or the draft EMP
- define, in plain English, any technical terms used
- present adverse and beneficial effects in quantitative and/or qualitative terms as appropriate.

Where possible, information provided in the EIS should be clear, logical, objective and concise, so that non-technical people may easily understand it. Where appropriate, text should be supported by maps and diagrams and factual information in the document should be referenced. Where applicable, aerial photography and/or digital information (e.g. of project site) should be presented.

The terms ‘describe’, ‘detail’ and ‘discuss’ should be taken to include both quantitative and qualitative matters as practical and meaningful. 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.

While every attempt has been made to ensure that these TOR address the major issues associated with projects of this type, the final TOR may not be exhaustive. The EIS should also address such matters if either of the following apply:

- environmental or other studies reveal a matter that was not foreseen when the TOR were prepared
- the Coordinator-General directs the proponent (or its consultants), in writing, to address a matter.

Within these TOR, the term 'project' includes all activities undertaken on lands covered by the proposed development, channel and other dredging or dredge material disposal, access required for construction purposes and supporting project infrastructure.

6. Stakeholder consultation

The proponent should undertake a comprehensive and inclusive consultation plan with the stakeholder groups identified in Part A, Section 4 (page 5). Consultation with advisory agencies should be the principal forum for identifying legislation, regulations, policies and guidelines relevant to the project and EIS process.

The public consultation plan should identify broad issues of concern to local and regional community and interest groups and address issues from project planning through commencement, project operations and decommissioning. The consultation plan should identify:

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

The consultation plan should detail how results of consultation will be considered by the proponent and integrated into the EIS process.

7. EIS format and copy numbers

7.1 General requirements

The EIS should be written in plain English and in a format matching the TOR or include guidelines (preferably as an appendix) describing how the EIS responds to the TOR. Where the project is made up of several components, the EIS should make it clear which project component is being discussed, to allow assessment agencies and other readers to differentiate between the components.

The EIS should contain (as part of the executive summary) a one-page table that explains where readers can find categories of information in the report. This should particularly cover subjects that are presented in multiple places in the EIS.

Include maps, diagrams and other illustrative material in the EIS to assist readers to interpret information.

7.2 Specific format and copy requirements

The proponent must publish the EIS as follows:

(1) On a website that is hosted at the proponent's own expense, in both HTML and portable document format (PDF), as follows:

  (a) pages produced in HTML format must meet the *W3C web content accessibility guidelines* (refer to **www.w3.org**). All cross-references to sections elsewhere in the EIS must be hyperlinked; and all external web links must be hyperlinked.

  (b) PDF files must meet the following requirements:

    (i) no larger than two megabytes in size (documents can be uploaded in sections to meet this requirement)

    (ii) text size and graphics files included in the PDF documents should be of sufficient resolution to facilitate reading and enable legible printing

    (iii) produced in accordance with Adobe's PDF accessibility best practice guides available at: **www.adobe.com/accessibility/products/acrobat/training.html** and meet the following minimum accessibility requirements:

      A. document structure tags and proper read order

      B. searchable text

      C. alternative text descriptions

      D. security that does not interfere with assistive technology.

(2) As a single PDF file on a CD-ROM, DVD or other electronic memory device. This PDF file, which will be read by staff from DEEDI and other assessment agencies, must include:

  (a) bookmarks (links) to all sections of the document (down to five heading levels); and the PDF file must be set to open with the bookmarks showing by default

  (b) active (clickable) internal hyperlinks to any pages, sections or diagrams that have been cross-referenced within the EIS

  (c) active (clickable) hyperlinks to any external websites/documents that have been included in the EIS.

(3) Provide a PDF version of the executive summary, no larger than two megabytes in size, on a CD-ROM or DVD. This file will be placed on the DEEDI website; and the PDF file must meet the accessibility requirements listed under point (1)(b) above.

(4) Provide all maps/diagrams/figures in JPG format, on a separate CD-ROM, DVD or other electronic memory device. All JPG files should be a minimum of 300 dpi.

(5) Limited copies of the EIS should be produced on A4-size paper capable of being photocopied, with maps and diagrams of A4 or A3 size (discuss this requirement with DEEDI staff in the early stages of the EIS process).

8. Contact details

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

EIS Project Manager—Townsville Port Expansion project
Significant Projects Coordination
Office of the Coordinator-General
PO Box 15517
City East Qld 4002
tel + 61 7 3224 2414
fax+ 61 7 3225 8282
email TPE@deedi.qld.gov.au
web http://projects.industry.qld.gov.au

Part B Contents of the EIS

The EIS should follow the format and content outlined in these TOR; however, changes to the structure can be discussed with the EIS project manager.

1. Executive summary

The executive summary should 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, avoid using jargon, be written as a stand-alone document and be structured to follow the EIS. It should be easy to reproduce and distribute on request to interested parties who may not wish to read or purchase the whole EIS.

The executive summary should include:

- project title
- proponent's name and contact details
- 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 and need for the project, including the consequences of not proceeding with the project
- an outline of the alternative options considered and reasons for selecting the proposed development option
- a brief description of the project (pre-construction, construction, operational activities and decommissioning) and the existing environment, using visual aids where appropriate
- an outline of the principal environmental impacts predicted and the proposed environmental management strategies 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
- detailed maps of the proposed project location and any other critical figures.

2. Glossary of terms

Provide a glossary of technical terms, acronyms, abbreviations and references.

3. Introduction

Clearly explain the function of the EIS, why it has been prepared and what it sets out to achieve. Include an overview of the structure of the document.

3.1 Project proponent

Describe the proponent's experience, including the nature and extent of business activities, experience and qualifications, and environmental record, including the proponent's environmental, health, safety and community policies.

3.2 Project description

Briefly describe the key elements of the project with illustrations or maps. Summarise any major associated infrastructure requirements. Provide detailed descriptions of the project in Part B, Section 4 (refer to page 15).

3.3 Project rationale

Describe the specific objectives and justification for the project, including its strategic, economic, environmental and social implications, technical feasibility and commercial drivers. Discuss the status of the project in a regional, state and national context. Explain the project's compatibility with relevant policy, planning and regulatory frameworks.

3.4 Relationship to other projects

Describe how the project relates to other infrastructure projects (of which the proponent should reasonably be aware) that have been, are being taken or that have been approved in the area affected by the project (including the Townsville Port Marine Precinct project).

Provide details of how proposed future port activities may impact on the project.

As a result of this assessment, there may be opportunities to co-locate existing or proposed infrastructure, enabling efficiency gains and mitigating environmental and property impacts. Where co-location may be likely, outline opportunities to coordinate or enhance impact mitigation strategies. Discuss the opportunities in sufficient detail to enable the reader to understand the reasons for preferring certain options or courses of action and rejecting others.

3.5 Project alternatives

Describe feasible alternatives including conceptual, technological and locality alternatives to the proposed project and the consequences of not proceeding with the project. Detail the criteria used to determine the alternatives including an economic analysis where appropriate and provide sufficient detail to enable the reader to understand why certain options or courses of action are preferred and why others are rejected (including the 'no action' option). Discuss the interdependencies of the project components, particularly in regard to how 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.

3.6 The environmental impact assessment process

3.6.1 Methodology of the EIS

Provide an outline of the environmental impact assessment process, including the role of the EIS in the Coordinator-General's decision-making process. Include information on relevant stages of the EIS development, 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.

3.6.2 Objectives of the EIS

Provide a statement of the objectives of the environmental impact assessment process. The structure of the EIS can then be outlined and used to explain how the EIS will meet its objectives. The purpose of the EIS is to:

- provide public information on the need for the project, alternatives to it and options for its implementation
- present the likely effects of the project on the natural, social and economic environment
- demonstrate how environmental impacts can be avoided, managed or mitigated and the offsets for any residual impacts
- provide information to formulate the project's EMP.

3.6.3 Submissions

Inform the reader how to properly make submissions and what form the submissions should take. Inform the reader how and when properly made public submissions on the EIS will be addressed and taken into account in the decision-making process. Also indicate any implications for submissions in the event of any appeal processes.

3.7 Public consultation process

The public consultation process 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 (i.e. newsletters), and other consultation mechanisms to encourage and facilitate active public consultation. The public consultation processes (community engagement) for all parts of the EIS should be integrated.

Outline the methodology that was adopted to:

- identify the stakeholders and how their involvement was facilitated
- identify the processes conducted to date and the future consultation strategies and programs including those during the operational phase of the project

- indicate how consultation involvement and outcomes were integrated into the EIS process and future site activities including opportunities for engagement and provision for feedback and action if necessary.

List the stakeholders consulted during the program and provide details of any meetings held, presentations made and any other consultation undertaken for the EIS process. Provide information about the consultation process that has taken place and the results.

3.8 Project approvals

3.8.1 Relevant legislation and approvals

List and describe Commonwealth, state and local legislation and policies relevant to the planning, approval, construction and operation of the project. Identify all approvals, permits, licences and authorities that will need to be obtained for the proposed project. Outline the triggers for the application of each of these and identify relevant approval requirements.

Commonwealth legislation

Relevant Commonwealth legislation may include, but is not limited to:

- *Aboriginal and Torres Strait Islander Heritage Protection Act 1994*
- *Environmental Protection (Sea Dumping) Act 1981* (EPSD Act)
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Great Barrier Reef Marine Park Act 1975* (GBRMP Act)
- *Maritime Transport and Offshore Facilities Security Act 2003*
- *Native Title Act 1993.*

Identify and outline relevant Commonwealth obligations such as:

- protection of World Heritage values
- migratory animals (China–Australia Migratory Bird Agreement (CAMBA), Japan–Australia Migratory Bird Agreement (JAMBA), Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA) and Bonn Convention)
- biodiversity
- climate
- wetlands of international importance (Ramsar).

Commonwealth approvals

Identify and outline Commonwealth approvals required including, but not limited to:

- approval, under sections 131(1) and 133 of the EPBC Act, of the proposed action for each of the applicable controlling provisions (SEWPaC)
- approval to dredge within the boundary of the Great Barrier Reef Marine Park under the GBRMP Act (Great Barrier Reef Marine Park Authority)
- permit to dispose of dredge material at sea under the EPSD Act (SEWPaC).

Also, identify and outline relevant Commonwealth obligations relating to the protection of World Heritage values, National Heritage values, declared Ramsar wetlands, listed threatened species and ecological communities, migratory animals (China–Australia Migratory Bird Agreement (CAMBA), Japan–Australia Migratory Bird Agreement (JAMBA), Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA) and Bonn Convention) and biodiversity.

Queensland legislation

Where relevant, refer to applicable Queensland legislation, which may include but is not limited to:

- *Aboriginal Cultural Heritage Act 2003*
- *Coastal Protection and Management Act 1995* (Coastal Act)
- *Environmental Protection Act 1994*
- *Fisheries Act 1994*
- *Land Act 1994*
- *Land Protection (Pest and Stock Management) Act 2002*
- *Marine Parks Act 2004*
- Maritime Safety Queensland Regulation 2002
- *Mineral Resources Act 1989*
- *Nature Conservation Act 1992*
- *Petroleum and Gas (Production and Safety) Act 2004*
- *Queensland Heritage Act 1992*
- *State Development and Public Works Organisation Act 1971* (SDPWO Act)
- *Sustainable Planning Act 2009*
- *Transport Infrastructure Act 1994*
- *Transport Operations (Marine Pollution) Act 1995*
- *Transport Operations (Marine Safety) Act 1994*
- Transport Operations (Maritime Safety) Regulation 2004
- *Transport Operations (Road Use Management) Act 1995*
- *Transport Planning and Coordination Act 1994*
- *Vegetation Management Act 1999*
- *Waste Reduction and Recycling Act 2011*
- *Water Act 2000.*

Queensland approvals

Key Queensland approvals required, and to be considered in the EIS process include:

- quarry allocation under the Coastal Act
- permit for development within a coastal management district, that is:
  - disposal of dredged spoil or other solid waste material in tidal water—Coastal Act
  - development permit for tidal works—Coastal Act
  - reclaiming land under tidal water—Coastal Act

- development permit for operational work that is the removal, destruction or damage of a marine plant—*Fisheries Act 1994*
- permit for Resource Entitlement under the *Land Act 1994*
- permit to dredge the channel extension area where it falls within the boundary of a State Marine Park (i.e. the Great Barrier Reef Coast Marine Park)—*Marine Parks Act 2004*
- material change of use of a premises for an environmentally relevant activity (ERA)—ERA16: Extractive and screening activities (dredging)—EP Act
- road impact assessment (including transport impact assessment) and road-use management plan for development on land not contiguous to a state-controlled road—TI Act.

Identify the relevant approval agency for each of the approvals required.

Identify existing approvals that are currently held by the Port that relate to those being sought by this development. In particular, clearly identify existing approvals that are referred to for sections of the development and whether amendments will be sought to these existing approvals.

3.8.2 Relevant plans

Outline the project's consistency with the existing national, state, regional and local planning framework that applies to the project location. Refer to all relevant statutory and non-statutory plans, planning policies, guidelines, strategies and agreements.

4. Description of the project

Describe the project through its lifetime of pre-construction, construction, operation and potentially 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.

4.1 Overview of the project

Provide an overview of the project to put it into context. Include:

- a rationale explaining the selection of the preferred operating scenario, including details such as cost, environmental impacts, and the operational efficiencies of each option
- a description of the key components of the project including the use of text and design plans where applicable
- a summary of any environmental design features of the project
- the expected cost, timing, and overall duration of the project, including details of and justification for, any staging of the development.

4.2 Location

Describe, using maps at suitable scales, the regional and local context of the project and all associated infrastructure. Provide real property descriptions of the project. Maps should show the precise location of the project area, in particular the:

- location and boundaries of current or proposed land tenures that the project area is or will be subject to, and details of the ownership of that land
- location, size and boundaries of the project footprint, including easement widths and access requirements
- location and size of any proposed buffers surrounding the working areas (for dredging, construction and operation)
- location of infrastructure relevant to the project, including but not limited to, the state-controlled road network, local roads and railways (including the Eastern Access Corridor road and railway alignments), marine infrastructure such as navigation aids and electricity infrastructure
- location of features such as waterways (e.g. rivers, streams, creeks, other water bodies and wetlands) and shorelines, significant vegetation and navigation channels
- location of any proposed site offices and accommodation sites
- extent of strategic port land and future strategic port land
- views to and from the site
- the relationship to World Heritage Areas and State marine waters.

4.3 Construction phase

Provide a detailed staging plan and approximate timeframes for the project's construction activities.

Provide an estimate of the number and roles of persons to be employed during the construction phase of the project.

Provide the following information on the pre-construction, construction and commissioning of the project including detailed plans, drawings and maps where appropriate. Reference should be made to building and engineering standards for tidal works.

4.3.1 Pre-construction activities

Describe all pre-construction activities, including nature, scale and timing of :

- land acquisitions required, be it in full or as easements, leases etc.
- vegetation clearing
- site access
- earthworks
- interference with watercourses and floodplain areas, including wetlands
- site establishment requirements for construction facilities, including access restriction measures and expected size, source and control of the construction

workforce accommodation, services (water, sewage, communication, power, recreation) and safety requirements

- temporary works
- upgrade, relocation, realignment, deviation of or restricted access to roads and other infrastructure (including electricity infrastructure)
- equipment to be used.

4.3.2 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:

- *Reclaiming land under tidal water* (Department of Environment and Resource Management 2010f)
- *Allocation of quarry material* (Department of Environment and Resource Management 2010a)
- reference to relevant policies of the *Queensland Coastal Plan* (Department of Environment and Resource Management 2012a) relating to reclaiming land
- *Guideline: Disposing of material in tidal water* (Department of Environment and Resource Management 2010b)
- *Guideline: maintenance dredging undertaken by a port authority – ERA 16* (Department of Environment and Resource Management 2010c)
- Operational policy – material change in intensity or scale for an environmentally relevant activity (Department of Environment and Resource Management 2011a).

Address the following requirements for construction and maintenance dredging:

- Describe and map the location, area and volume of dredging required, differentiating capital from historical or current dredge areas. Provide maps and map overlays indicating areas that have been disturbed and those areas that 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, highest astronomical 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 (AHD).
- 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 disposing 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, which would avoid or minimise impacts on, birds, marine mammals, turtles and fish, including migrations and marine plant propagation
- Provide details of the current approved dredged disposal area e.g. capacity and ability of the site to accommodate dredge material from the proposed development.

4.3.3 Structures

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

Describe all structures, including:

- locations and dimensions of buildings and marine infrastructure associated with the port expansion
- the likely interface of the port expansion infrastructure with the future port road and rail infrastructure
- the likely construction methodologies
- earthworks, including fill and rock that may need to be imported to the project site, and identifying relevant licensed quarries
- 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
- reference should be made to DERM policies:
  - Assessment of coastal revetment alignment (2010d)
  - Building and engineering standards for tidal works (2010e)

Information provided should address current legislative policy relating to erosion protection structures.

4.3.4 Other construction activities

Describe all the construction elements of the project, providing details of:

- an indicative construction timetable, including expected commissioning and start-up dates and hours of operation
- major work programs for the construction phase, including an outline of construction methodologies

- construction inputs, handling and storage including an outline of potential locations for source of construction materials
- major hazardous materials to be transported, stored and/or used on site, including environmental toxicity data and biodegradability
- clean-up and restoration of areas used during construction, including camp site(s) and storage areas, if applicable.

4.3.5 Other project-specific infrastructure

Describe:

- all other infrastructure required to be constructed, upgraded, relocated or decommissioned for the construction and/or operation of the project, such as resource extraction areas, access roads and haulage routes, power supply, connection to sewerage or water supply
- the design and construction standards to be met (e.g. waterway crossings should be designed to meet the requirements of the *Fisheries Act 1994* (Qld) and in consultation with DEEDI staff)
- alternative approaches or the opportunity to obtain materials from alternative sources.

4.3.6 Commissioning

Describe the commissioning process including the associated environmental impacts.

4.4 Operation phase

Describe the location and nature of the processes to be used and provide supporting maps, diagrams and artist's impressions as required. Provide full details of the operation for all elements of the project, including:

- a description of the nature and description of all key operational activities (including expected plant and equipment)
- the capacity of the project equipment and operations
- 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.
- estimated numbers and roles of persons to be employed during the operational phase of the project
- opportunities for future expansion.

4.5 Associated infrastructure

Detail, with the aid of concept and layout plans, requirements for new infrastructure or upgrading/relocating existing infrastructure to service the project. Consider infrastructure such as transportation (road/rail/air/ship), water supply, energy supply, telecommunications, stormwater, waste disposal and sewerage.

4.6 Decommissioning and rehabilitation

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

5. Environmental values and management of impacts

Detail the environmental protection and mitigation measures incorporated in the planning, construction, rehabilitation, commissioning, operations and decommissioning of all facets of the project. Measures should prevent, or where prevention is not possible, minimise environmental harm and maximise environmental benefits of the project. Identify and describe preferred measures in more detail than other alternatives.

The protection and enhancement of human health during construction and operation of the project must be described.

The objectives of the following subsections are to:

- describe the existing environmental values of the area that may be affected by the project, using background information and/or new studies to support statements (include reference to all definitions of environmental values set out in relevant legislation, policies and plans)
- describe the potential adverse and beneficial impacts of the project on the identified environmental values and the measures taken to avoid, minimise and/or mitigate those impacts
- describe any cumulative impacts on environmental values caused by the project, either in isolation or in combination with other known existing or planned projects
- present objectives, standards and measurable indicators that protect the identified environmental values
- examine viable alternative strategies for managing impacts (present and compare these alternatives in view of the stated objectives and standards to be achieved)
- discuss the available techniques to control and manage impacts in relation to the nominated objectives.

Where negative impacts of the project cannot be avoided or adequately minimised or mitigated, present proposals to offset impacts in accordance with the Queensland Government Environmental Offsets Policy (Environmental Protection Agency 2008b).

The EIS should follow the format and content outlined in these TOR; however, changes to the structure can be discussed with the EIS project manager. The mitigation

measures, monitoring programs etc., identified in this section of the EIS should be used to develop the EMP for the project. Refer to Part B, Section 10 (page 59).

5.1 Climate, natural hazards and climate change

Describe the climatic conditions that may affect management of the project. This includes a description of the vulnerability of the project area to seasonal conditions, extremes of climate (e.g. cyclones) and natural or induced hazards (including bushfires) and climate change. Reference should also be made to the State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (Department of Local Government and Planning & Department of Emergency Services 2003). Provide a risk assessment (as part of the requirements of Part B, Subsection 8.1 of these TOR) and management plan detailing these potential climatic threats to the construction, and operation of the project. Include the following:

- a risk assessment of changing climate patterns that may affect the viability and environmental management of the project
- the preferred and alternative adaptation strategies to be implemented
- commitments to working cooperatively, where practicable, with government, other industry and other sectors to address adaptation to climate change.

Address the most recent information on potential impacts of climatic factors in the appropriate sections of the EIS.

Specific storm surge requirements are addressed in section 5.4 below.

5.1.1 Flood plain management

Due to the location of the site, a comprehensive flood study should be included in the EIS that:

- quantifies flood impacts on properties surrounding and external to the project site from redirection or concentration of flows
- identifies potential variation of increased flood levels, increased flow velocities or increased time of flood inundation as a result of the development.

The flood study should address any requirements of local or regional planning schemes for flood affected areas. The study report should include details of all calculations along with descriptions of base data, any potential for loss of flood plain storage, and triangulated surface meshes produced in terrain modelling software. Reference must be made to any studies undertaken by the local council in relation to flooding.

Reference should be made to Temporary State Planning Policy 2/11: Planning for stronger, more resilient floodplains (Queensland Reconstruction Authority 2011).

5.2 Land

Detail the existing land environment values for all areas associated with the project. 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 (on and off Port land).

5.2.1 Scenic amenity and lighting

Description of environmental values

Describe, in general terms, the existing character of the landscape and the general impression that would be obtained while travelling through and around it. Outline existing landscape features, panoramas and views that have, or could be expected to have, value to the community. Include information such as maps and photographs, particularly where addressing the following issues:

- major views, view sheds, outlooks, and features contributing to the amenity of the area, including assessment from private residences
- focal points, landmarks, waterways and other features contributing to the visual quality of the area and the project site(s)
- character of the local and surrounding areas including vegetation and land use.

Reference should be made to the *Queensland Coastal Plan: State Planning Policy for Coastal Protection Guideline* (Department of Environment and Resource Management 2011e) (Annex 3—Determining scenic preference in the coastal zone).

Include any relevant World Heritage and National Heritage values of the area.

Potential impacts and mitigation measures

Describe the potential beneficial and adverse impacts of the project on landscape character and visual qualities of the site and the surrounding area. Address the local and broader visual impacts of the project buildings, other structures, and breakwater. This should include views from:

- places of residence, work, and recreation
- road, cycle and walkways
- the air
- other known vantage points day and night (e.g. Castle Hill)

during all stages of the project as it relates to the surrounding landscape.

Use sketches, diagrams, computer imaging/simulation and photos where possible to portray the near and far views of the completed structures and their surroundings from visually sensitive locations.

Detail the measures to be undertaken to mitigate or avoid identified adverse impacts.

Lighting

Provide an assessment of all potential impacts of the project's lighting, during all stages, with particular reference to objectives to be achieved and management methods to be implemented to mitigate or avoid, such as:

- the visual impact at night
- night operations/maintenance and effects of lighting on marine and terrestrial fauna and residents

- the potential impact of increased vehicular traffic
- changed habitat conditions for nocturnal fauna and associated impacts.

5.2.2 Topography, geology and soils

Description of environmental values

Provide maps locating the project in state, regional and local contexts. The topography should be detailed with contours at suitable increments, shown with respect to AHD. Include significant features of the landscape and topography, and accompanying comments on the maps.

Provide a description, map and a series of cross-sections of the geology of the project area relevant to the project components. Describe the geological properties that may influence ground stability, occupational health and safety, or the quality of stormwater leaving any area disturbed by the project. In locations where the age and type of geology is such that significant fossil specimens may be uncovered during construction/operations, address the potential for significant finds.

A soil survey of the sites affected by the project must be conducted at a suitable scale, with particular reference to the physical and chemical properties of the materials that will influence erosion potential, stormwater run-off quality, rehabilitation and agricultural productivity of the land. Provide information on soil stability and suitability for construction of project facilities.

Assess the potential for acid sulfate soils in accordance with:

- Queensland Acid Sulfate Soil Technical Manual (refer to: **www.derm.qld.gov.au/land/ass/products.html**)
- State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils (Department of Natural Resources and Mines & Department of Local Government and Planning 2002a)
- *State Planning Policy 2/02 Guideline: Acid Sulfate Soils* (Department of Natural Resources and Mines & Department of Local Government and Planning 2002b).

Soils should be described and mapped at a suitable scale and described according to the *Guidelines for Surveying Soil and Land Resources* (McKenzie et al. 2008) and *Australian soil classification* (Isbell & CSIRO 2002). Undertake an appraisal of the depth and quality of useable soil.

Provide a map and description of:

- the location of key tidal planes such as:
  - the Highest Astronomical Tide
  - Mean High Water Spring Tide
  - Mean High Water Neap Tide
  - Mean Sea Level
  - Mean Low Water Neap Tide
  - Mean Low Water Spring Tide
  - Lowest Astronomical Tide.

- the bathymetry of the project area and surrounds
- relevant coastal geomorphology.

Potential impacts and mitigation measures

Provide details of any potential impacts to the topography or geomorphology associated with the project and proposed mitigation measures, including:

- a discussion of the project in the context of major topographic features and any measures taken to avoid or minimise impact to such, if required
- the objectives to be used for the project in any re-contouring or consolidation, rehabilitation, landscaping, and fencing.

Identify the possible soil erosion rate for all permanent and temporary landforms and describe the techniques used to manage the impact. Include an assessment of likely erosion effects, especially those resulting from removing vegetation, and constructing retaining walls both on-site and off-site for all disturbed areas.

Identify all soil types and outline the erosion potential (both wind and water) and erosion management techniques to be used. Provide details of an erosion-monitoring program (including rehabilitation measures for erosion problems identified during construction), and detail acceptable mitigation strategies.

Summarise methods proposed to prevent or control erosion with regard to:

- the *Soil Erosion and Sediment Control—Engineering Guidelines for Queensland Construction Sites* (Institution of Engineers Australia 1996)
- the *Urban Stormwater Quality Planning Guidelines 2010* (Department of Environment and Resource Management 2010h)
- preventing soil loss in order to maintain land capability/suitability
- preventing degradation of local waterways.

Discuss the potential for acid generation through disturbance of acid sulfate soils during earthworks and construction, and propose measures to manage soils and mitigate impacts for all site earthworks and construction activities. Should action criteria be triggered by acid generating potential as a result of testing, outline management measures in an acid sulfate soils management plan prepared in accordance with:

- Queensland Acid Sulfate Soil Technical Manual (refer to: **www.derm.qld.gov.au/land/ass/products.html#guidelines**)
- the requirements of State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils (Department of Natural Resources and Mines & Department of Local Government and Planning 2002a)
- *State Planning Policy 2/02 Guideline: Acid Sulfate Soils* (Department of Natural Resources and Mines and Department of Local Government and Planning 2002b).

5.2.3 Land contamination

Description of environmental values

Include:

- 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 whether or not remediation is required
- a description of the nature and extent of contamination at each site.

Potential impacts and mitigation measures

Discuss the management of any contaminated land and potential for contamination from construction, commissioning and operation, in accordance with the Department of Environment and Resource Management's *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* (Department of Environment 1998) and the National Environment Protection (Assessment of Site Contamination) Measure 1999 (Cwlth).

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.

State any intentions concerning the classification of land contamination after project completion.

5.2.4 Land use and tenure

Description of environmental situation

Identify, with the aid of maps:

- land tenure, including reserves, tenure of special interest such as protected areas and forest reserves, existing and proposed gas infrastructure, water pipelines, power infrastructure (above and underground) and transport corridors, including local roads, state-controlled roads and rail corridors
- existing land uses and facilities surrounding the project
- distance of the project from residential and recreational areas
- location of the project in relation to environmentally sensitive areas.

Potential impacts and mitigation measures

Detail the potential for the construction and operation of the project to change existing and potential land uses of the project site and adjacent areas. Describe the following:

- impacts on surrounding land uses and human activities and strategies for minimisation, such as:
  - key resource areas (refer to State Planning Policy 2/07: Protection of Extractive Resources (Department of Mines and Energy 2007a) and *State Planning Policy 2/07 Guideline: Protection of Extractive Resources* (Department of Mines and Energy 2007b))

  - residential and industrial uses
- possible effect on town planning objectives and controls, including local government zoning and strategic plans
- constraints to potential developments and possibilities of rezoning adjacent to the development area
- management of the immediate environs of the project including construction buffer zones
- the potential native title rights and interests likely to be impacted upon by the project and the potential for managing those impacts by an Indigenous land use agreement or other native title compliance outcomes
- proposed land use changes in any areas of high conservation value and information on how easement widths and vegetation clearance in sensitive environmental areas will be minimised
- potential issues involved in proximity and/or co-location of other current or proposed infrastructure services (e.g. rail corridor)
- any land units requiring specific management measures.

5.3 Transport

Present the transport assessment in separate reports for each project-affected mode (road, rail, air and sea) as appropriate. These assessment reports should provide sufficient information to allow an independent assessment of how existing transport infrastructure will be affected by project transport at the local and regional level.

5.3.1 Existing infrastructure

Describe the extent, condition and capacity of the existing transport infrastructure on which the project will depend. Particular mention must be made of the interaction with the Townsville Port Access Transport Corridor. This will include identification and analysis of construction measures for the interface between the port and the access corridor (road and rail). This should also demonstrate how the integrity of the road/rail corridor will be maintained.

Describe the project's impact on local and state-controlled road networks. Include an overview map(s) that shows the project's relationship with current and future local and state-controlled road networks. Include in the map(s) the location of construction activities and access locations (existing and proposed).

Also describe the existing rail network and interaction of the project with the rail corridor and infrastructure with maps at an appropriate scale.

5.3.2 Transport tasks and routes

Describe:

- expected volumes of project inputs and outputs of transported raw materials, wastes, hazardous goods, finished products for all phases of the project
- how identified project inputs and outputs will be moved through the transport network (volume, composition, trip timing and routes)

- traffic generated by workforce personnel including visitors (volume, composition, timing and routes)
- likely heavy and oversize/indivisible loads (volume, composition, timing and routes), highlighting any vulnerable bridges and structures along proposed routes.

5.3.3 Potential impacts and mitigation measures

Impact assessment reports should include details of the adopted assessment methodology (for impacts on roads: the road impact assessment report in general accordance with the *Guidelines for Assessment of Road Impacts of Development* (Department of Main Roads 2006).

Assess project impacts on:

- local and state road networks
- capacity, safety (including level crossing safety in consultation with Queensland Rail), local amenity, efficiency and condition of transport operations, services and assets (from either transport or project operations)
- walking and cycling paths
- possible interruptions to transport operations
- the natural environment within the jurisdiction of an affected transport authority (e.g. road and rail corridors)
- the nature and likelihood of product-spill during transport, if relevant
- driver fatigue for workers travelling to and from regional centres and key destinations
- any existing or proposed strategies for public passenger transport and active transport and address, where relevant, requirements of Part 2A of the *Transport Planning and Coordination Act 1994* (Qld)
- access to transport for people with a disability.

5.3.4 Infrastructure alterations

Detail:

- any proposed alterations or new transport-related infrastructure and services required by the project (as distinct from impact mitigation works)
- construction of any project-related plant and utilities, within or impacting on the jurisdiction of any transport authority.

5.3.5 Transport management strategies

Discuss and recommend how identified impacts will be mitigated so as to maintain safety, efficiency and condition of each mode. These mitigation strategies are to be prepared in close consultation with relevant transport authorities and consider those authorities' works programs and forward planning.

Findings of studies and transport infrastructure impact assessments should be an input into preparing a transport management plan.

Road/rail management planning

Outline:

- consideration of any mitigation works for road/rail corridors, including consultation with relevant road/rail managers and strategies for any associated works
- strategies to minimise the effects of project transport on existing and future public road or rail corridors and rail level crossing safety
- steps to be taken to prevent access from public roads/rail corridors to the project sites
- strategies to maintain safe access to public road/rail reserves to allow road/rail/pipeline maintenance activities
- process for decommissioning any temporary access to road/rail reserves, e.g. stockpile sites

Findings of studies and transport infrastructure impact assessments should be an input into preparing a draft road-use management plan. Conditions of approval for transport management impacts should also be detailed in the EMP.

Shipping management planning

Develop management plans in accordance with the *Maritime Safety Queensland Guidelines for Major Development Proposals* (Department of Transport and Main Roads 2010).

The Regional Harbour Master (RHM) should be consulted on maritime issues relating to the movement and loading of tankers and any barge operations. The EIS should discuss the results of the consultation.

Describe current vessels utilising the port and in the Commonwealth Marine Area, their size, shipping movements, anchorages, access to/from the port and navigational arrangements.

In regard to increased shipping volumes, the following should be specifically addressed:

- potential for introduction of exotic organisms/marine pests from increased shipping and relevant investigation screening methodology
- ballast water management arrangements—including Australian Quarantine and Inspection Service mandatory arrangements and the port's contingency planning
- management of ship waste, in particular quarantine waste, domestic garbage, oil and sewage
- risk of spills and their management
- potential foreshore damage caused by tanker and tug activities
- potential for increased vessel strike to marine species
- potential impacts on existing shipping activity and navigable channels
- potential use of the Great Barrier Reef World Heritage Area
- routes of ships in transit through port waters and the aligned infrastructure such as navigational aids

- in consultation with Maritime Safety Queensland, the RHM and other relevant agencies as required prepare:
  - an aids to navigational management plan
  - a vessel traffic management plan
  - a ship-sourced pollution management plan and
  - a cyclone contingency plan.

Consider also the potential of the proposal to impact on recreational craft.

5.4 Coastal environment

Describe the existing coastal environment that 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.

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* (Coastal Act).

Assess the project's consistency with the relevant policies of the *Queensland Coastal Plan*, including the State Planning Policy 3/11: Coastal Protection (Department of Environment and Resource Management 2011e) and the State Policy for Coastal Management (Department of Environment and Resource Management 2012b).

5.4.1 Hydrodynamics and sedimentation

Description of environmental values

Assess the 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 coastal environment related to the project including:

- waves
- currents
- tides
- storm surges
- freshwater flows
- 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.

Undertake two- and/or three-dimensional modelling. 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 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. Detail the interaction of freshwater flows with different tidal states, including storm tides. Describe 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.

Describe the amount of beach sand movement and or loss, adjacent to the project area that may be affected by the project.

Potential impacts and mitigation measures

Describe the potential changes to the hydrodynamic processes and local sedimentation within Cleveland Bay and adjoining waterways resulting from the construction and operation of the project. This should include:

- impacts on tidal flows and water levels
- changes to sediment transport patterns, including the potential of the proposal to impact on bank erosion and/or bed degradation within adjacent waterways
- Any additional effects of climate change and sea level rise

This assessment should also discuss the potential impacts associated with extreme events such as storm tide flooding which may result from changes to bathymetry and coastline as a result of the project. This must include an assessment of the vulnerability of the project to storm tide flooding and the potential of the project to affect vulnerability to storm tide flooding on adjacent properties.

Describe the impact and relevant strategies of long swell wave energy reflection on dredging and breakwater protection.

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

When assessing the hydrodynamics of the area and movement of sediment along the coast, consider coastal processes such as erosion and accretion at adjacent locations including The Strand, Rowes Bay and Pallarenda. Determine the potential sand loss and the amount to renourish beaches adjacent to the project area quantified in terms of tonnes per annum.

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

5.4.2 Water quality

Description of environmental values

Provide baseline information on water quality of coastal waters. This information should include (but is not necessarily be limited to) general physical chemical water quality parameters such as dissolved oxygen, pH, heavy metals, nutrients, temperature, salinity, oil in water and turbidity. For coastal areas potentially affected by sediment run-off or dredging, suspended solids concentration and turbidity should also be included.

Discuss the interaction of freshwater flows from the Ross River and Ross Creek with coastal waters and the significance of this in relation to marine flora and fauna 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 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 EPP (Water) 2009
- reference should be made to the draft water quality objectives, as identified in the *Black Ross (Townsville) Water Quality Improvement Plan* (Townsville City Council 2010).

Potential impacts and mitigation measures

Define and describe the water quality objectives and practical measures for protecting, mitigating or enhancing coastal environmental values. This includes 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. Refer to the following:

- State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils (Department of Natural Resources and Mines & Department of Local Government and Planning 2002a)
- *Queensland Coastal Plan* (Department of Environment and Resource Management 2012a)
- *Restoration of fish habitats: Fisheries guidelines for marine areas— Fish Habitat Guideline FHG 002* (Hopkins, White & Clarke 1998).

Specific issues to be addressed include:

- the water quality objectives used (including how they were developed), and how predicted activities will meet these objectives (refer to the *Queensland Water Quality Guidelines 2009* (Department of Environment and Resource Management 2009) and *The Australian and New Zealand Guidelines for Fresh and Marine Water*

Quality (Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand 2000)

- potential threats to the water quality and sediment quality of the coastal environment within the project footprint, specifically associated with constructing and operating the facilities
- reference should be made to the draft water quality objectives, as identified in the *Black Ross (Townsville) Water Quality Improvement Plan* (Townsville City Council 2010).

This assessment shall consider, at minimum:

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

Describe strategies for protecting Ramsar wetlands; and discuss any obligations imposed by state or Commonwealth legislation or policy, or international treaty obligations (i.e. JAMBA, CAMBA and ROKAMBA).

5.4.3 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 sulfate potential. Present this information 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 Assessment Guidelines for Dredging* (Commonwealth of Australia 2009).

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.

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.

5.5 Nature conservation

Detail the existing nature conservation values that may be affected by the proposal. Describe the environmental values 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.

Survey effort should be sufficient to identify, or adequately extrapolate, the floral and faunal values over the range of seasons, particularly during and following a wet season. The survey should account for the ephemeral nature of watercourses traversing the proposal area, and seasonal variation in fauna populations.

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

Also outline the proposed strategies to avoid, or minimise and mitigate, impacts on the identified values within the project's footprint.

Identify key flora and fauna indicators for ongoing monitoring.

5.5.1 Sensitive environmental areas

Description of environmental values

Identify areas that are environmentally sensitive in proximity to the project on a map of suitable scale. This should include areas classified as having national, state, regional or local biodiversity significance, or flagged as important for their integrated biodiversity values. Refer to both Queensland and Commonwealth legislation and policies on threatened species and ecological communities.

Areas regarded as sensitive with respect to flora and fauna have one or more of the following features and should be identified and mapped:

- important habitats of species listed under the *Nature Conservation Act 1992* (Qld) (NC Act) and/or EPBC Act as presumed extinct, endangered, vulnerable or rare
- regional ecosystems listed as 'endangered' or 'of concern' under state legislation, and/or ecosystems listed as presumed extinct, endangered or vulnerable under the EPBC Act
- good representative examples of remnant regional ecosystems or regional ecosystems that are described as having 'medium' or 'low' representation in the protected area estate as defined in the Regional Ecosystem Description Database (REDD), available at **www.derm.qld.gov.au**
- sites listed under international treaties such as Ramsar wetlands and World Heritage areas
- sites containing near-threatened or bio-regionally significant species or essential, viable habitat for near-threatened or bio-regionally significant species

- sites in, or adjacent to, areas containing important resting, feeding or breeding sites for migratory species of conservation concern listed under the Convention of Migratory Species of Wild Animals, and/or bilateral agreements between Australia and other countries
- sites adjacent to nesting beaches, feeding, resting or calving areas of species of special interest (e.g. marine turtles, dugongs and cetaceans)
- sites containing common species that represent a distributional limit and are of scientific value or that contain feeding, breeding, resting areas for populations of echidna, koala, platypus and other species of special cultural significance
- sites of high biodiversity that are of a suitable size or with connectivity to corridors/protected areas to ensure survival in the longer term; such land may contain:
  - natural vegetation in good condition or other habitat in good condition (e.g. wetlands)
  - degraded vegetation or other habitats that still support high levels of biodiversity or act as an important corridor for maintaining high levels of biodiversity in the area
- a site containing other special ecological values (e.g. high habitat diversity and areas of high endemism) including seagrass beds
- ecosystems that 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
- declared fish habitat areas and sites containing protected marine plants under the *Fisheries Act 1994* (Qld)
- sites of palaeontologic significance such as fossil sites
- sites of geomorphological significance, such as lava tubes or karst
- protected areas that have been proclaimed under the NC Act and *Marine Parks Act 2004* (Qld) or are under consideration for proclamation
- areas of major interest, or critical habitat declared under the NC Act
- remnant vegetation listed under the *Vegetation Management Act 1999* (Qld) (VM Act) as containing endangered and of concern regional ecosystems where clearing is likely to result in land degradation and a loss of ecosystem function and biodiversity.

Areas of special sensitivity include the marine environment and wetlands, wildlife breeding or roosting areas, any significant habitat or relevant bird flight paths for migratory species, bat roosting and breeding caves including existing structures such as adits and shafts, and habitat of threatened plants, animals and communities.

Potential impacts and mitigation measures

Discuss the impact of the project on species, communities and habitats of local, regional or national significance in sensitive environmental areas as identified above. Include human impacts and the control of any domestic animals introduced to the area.

Demonstrate how the project would comply with the following hierarchy:

- avoiding impact on areas of remnant vegetation and other areas of conservation value including listed species and their habitat
- mitigating impacts through rehabilitation and restoration including, where relevant, a discussion of any relevant previous experience or trials of the proposed rehabilitation
- measures to be taken to replace or offset the loss of conservation values where avoiding and mitigating impacts cannot be achieved.

Explain why the measures above would not apply in areas where loss would occur.

Discuss the boundaries of the areas impacted by the project within or adjacent to an endangered ecological community, including details of footprint width. If the project area will impact upon a threatened community, include reasons for the preferred alignment and the viability of alternatives.

Address any actions of the project or likely impacts that require an authority under the NC Act, and/or would be assessable development for the purposes of the VM Act.

Outline how these measures will be implemented in the overall EMP for the project.

Provide details about the approvals that will be required under the NC Act and the VM Act for development made assessable under SPA. The overall EMP for the project should address the performance requirements of the relevant policies and regional vegetation management codes published by DERM.

For vegetation management policies, refer to: **www.derm.qld.gov.au/services_resources/item_list.php?category_id=215&topic_id=39**

For vegetation management codes, refer to: **www.derm.qld.gov.au/vegetation/regional_codes.html**

Where relevant, this section should discuss environmental offset requirements in accordance with the Queensland Government Environmental Offsets Policy (Environmental Protection Agency 2008b) and take into account the applicable specific-issue offset policies, as follows:

- Policy for Vegetation Management Offsets (Department of Environment and Resource Management 2011b)
- Queensland Biodiversity Offset Policy (Department of Environment and Resource Management 2011c)
- *Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss* (Fish Habitat Management Operational Policy FHMOP 005) (Dixon & Beumer 2002).

Describe any departure from no net loss of ecological values.

5.5.2 Terrestrial flora

Description of environmental values

Provide vegetation mapping for all relevant project sites. Adjacent areas should also be mapped to illustrate interconnectivity. Mapping should also illustrate any larger scale interconnections between areas of remnant or regrowth vegetation where the project site includes a corridor connecting those other areas. Discuss any variances between site mapping and mapping produced by the Queensland Herbarium.

Describe the terrestrial vegetation communities within the affected areas at an appropriate scale (maximum 1:10 000), with mapping produced from aerial photographs and ground-truthing, showing the following:

- location and extent of vegetation types using the regional ecosystem type descriptions in accordance with the REDD
- location of vegetation types of conservation significance based on regional ecosystem types and occurrence of species listed as protected plants under the Nature Conservation (Wildlife) Regulation 1994 (Qld) and subsequent amendments, as well as areas subject to the VM Act
- the current extent (bioregional and catchment) of protected vegetation types of conservation significance within the protected area estate (national parks, conservation parks, resource reserves, nature refuges and conservation reserves under the *Land Act 1994* (Qld))
- any plant communities of cultural, commercial or recreational significance
- the location of any horticultural crops in the vicinity of the project area
- location and abundance of any exotic or weed species.

Highlight sensitive or important vegetation types, including any marine littoral and subtidal zone and riparian vegetation, and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types. The 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.

For each significant natural vegetation community likely to be impacted by the project, vegetation surveys should be undertaken at an appropriate number of sites, allowing for seasonal factors, and satisfying the following:

- the relevant regional vegetation management codes
- site data should be recorded in a form compatible with the Queensland Herbarium CORVEG database
- the minimum site size should be 10 × 50 metres
- a complete list of species present at each site should be recorded
- the surveys to include species structure, assemblage, diversity and abundance
- the relative abundance of plant species present to be recorded
- any plant species of conservation, cultural, commercial or recreational significance to be identified

- any plant species of conservation, cultural, commercial or recreational significance to be identified
- specimens of species listed as protected plants under the Nature Conservation (Wildlife) Regulation, other than common species, are to be submitted to the Queensland Herbarium for identification.

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

Potential impacts and mitigation measures

Describe the potential environmental harm to the ecological values of the area arising from the construction, operation and decommissioning of the project including clearing, salvaging or removing vegetation. Discuss the indirect effects on remaining vegetation. Consider short- and long-term effects and comment on whether the impacts are reversible or irreversible.

With regard to all components of the project, include:

- a description of the potential impacts that clearing vegetation will have on listed species and communities in the extent of the proposed vegetation clearing
- any management actions to minimise vegetation disturbance and clearance
- a discussion of the ability of identified vegetation to withstand any increased pressure resulting from the project and any measures proposed to mitigate potential impacts
- a description of the methods to ensure rapid rehabilitation of disturbed areas following construction, including the species chosen for revegetation, which should be consistent with the surrounding associations
- details of any post construction monitoring programs
- a discussion of the potential environmental harm on flora due to any alterations to the local surface and groundwater environment with specific reference to impacts on riparian vegetation or other sensitive vegetation communities
- a description of any foreseen impacts which increase the susceptibility of ecological communities and species to the impacts of climate change.

Outline how these measures will be implemented in the overall EMP for the project. Weed management strategies are required for containing existing weed species (e.g. parthenium and other declared plants) and ensuring no new declared plants are introduced to the area. Refer to the local government authority's pest management plan and any strategies and plans recommended for the project area by Biosecurity Queensland. Discuss the strategies in accordance with provisions of the *Land Protection (Pest and Stock Route Management) Act 2002* (Qld) in the main body of the EIS and in the pest management plan within the EMP for the project.

5.5.3 Terrestrial fauna

Description of environmental values

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

- species diversity (i.e. a species list) and abundance of animals of recognised significance
- any species that are poorly known but suspected of being rare or threatened
- habitat requirements and sensitivity to changes, including movement corridors and barriers to movement
- the existence of feral or introduced animals including those of economic or conservation significance
- existence (actual or likely) of any species/communities of conservation significance 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 or threatened species recovery plans)
- habitat requirements and sensitivity to changes, including movement corridors and barriers to movement
- an estimate of commonness or rarity for the listed or otherwise significant species
- use of the area by coastal/marine birds, migratory birds, nomadic birds and terrestrial fauna.

Identify any species listed by the EPBC Act and the NC Act occurring in the project area. Identify any species listed by the DERM 'Back on Track' species prioritisation methodology (refer to **www.derm.qld.gov.au/wildlife-ecosystems/wildlife/back_on_track_species_prioritisation_framework/index.html**).

Indicate how well any affected communities are represented and protected elsewhere in the bio-region where the project occurs. Specify the methodology used for fauna surveys. Provide relevant site data to DERM in a format compatible with the Wildlife Online database for listed threatened species (refer to **www.derm.qld.gov.au/wildlife-ecosystems/wildlife/wildlife_online/index.html**).

Potential impacts and mitigation measures

The assessment of potential impact should consider impacts the project may have on terrestrial fauna, relevant wildlife habitat and other fauna conservation values, including:

- impacts due to loss of range/habitat, food supply, nest sites, breeding/recruiting potential or movement corridors or as a result of hydrological change
- impacts on native species, particularly species of conservation significance
- cumulative effects of direct and indirect impacts
- threatening processes leading to progressive loss

- a description of any foreseen impacts which increase the susceptibility of ecological communities and species to the impacts of climate change.

Describe strategies for protecting rare or threatened species, and discuss any obligations imposed by state or Commonwealth endangered species legislation or policy or international obligations (i.e. JAMBA, CAMBA and ROKAMBA).

Address any actions of the project or likely impacts that require an authority under the NC Act. Provide the following information on mitigation strategies:

- measures to avoid and mitigate the identified impacts. Any provision for buffer zones and movement corridors, nature reserves or special provisions for migratory animals should be discussed and coordinated with the outputs of the flora assessment
- details of the methodologies that would be used to avoid injuries to livestock and native fauna as a result of the project's construction and operational works, and if accidental injuries should occur, the methodologies to assess and handle injuries
- strategies for complying with the objectives and management practices of relevant recovery plans.

Outline how these measures will be implemented in the overall EMP for the project. Rehabilitation of disturbed areas should incorporate, where appropriate, provision of nest hollows and ground litter.

Address feral animal (including pest) management strategies and practices. The study should develop strategies to ensure that the project does not contribute to increased encroachment of a feral animal species. Refer to the local government authority's pest management plan and any strategies and plans recommended for the project area by Biosecurity Queensland. Discuss the strategies in accordance with the provisions of the Land Protection (Pest and Stock Route Management) Act in the main body of the EIS and in the pest management plan within the EMP for the project.

5.5.4 Aquatic ecology

Description of environmental values

General

Describe the aquatic flora and fauna present, or likely to be present, in the areas affected by the proposal, noting the patterns and distribution in the waterways and any associated wetlands. Include:

- fish species, mammals, reptiles, amphibians, crustaceans and aquatic invertebrates occurring in the waterways within the affected area (as defined under section 5 of the *Fisheries Act 1994*)
- any rare or threatened marine species
- a description of the habitat requirements and the sensitivity of aquatic species to changes in flow regime, water levels and water quality in the project areas
- aquatic plants including native and exotic/weed species
- aquatic and benthic substrate

- habitat downstream of the project or potentially impacted due to currents in associated lacustrine and marine environments
- aquatic substrate and stream type, including extent of tidal influence and common levels such as highest astronomical tide and mean high water springs.

Describe any wetlands listed by DERM as areas of national, state or regional significance and detail their values and importance for aquatic flora and fauna species.

Flora

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

Conduct field assessments for plant species, preferably in both pre- and post-wet season conditions, as follows:

- record site data in a form compatible with the Queensland Herbarium CORVEG database
- record a complete list of species present at each site, including those species defined and protected under the Fisheries Act
- record the relative abundance of plant species present
- identify any plant species of conservation, cultural, commercial or recreational significance
- submit specimens of species listed as protected plants under the Nature Conservation (Wildlife) Regulation (other than common species) to the Queensland Herbarium for identification and entry into the HERBRECS database.

Fauna—megafauna

Describe the aquatic fauna, such as dugongs, dolphins, whales, sea snakes and rays that may be impacted by the proposed development.

Fauna—turtles

Describe the turtle species that may be using beaches in proximity to the proposed development area. The proponent should monitor turtle nesting along beaches near the proposed project area for the duration of the turtle nesting seasons, for turtle species occurring in the area.

Undertake a desktop review of information on the turtle communities of the study area, particularly the green, hawksbill, loggerhead, olive ridley and flatback turtles, paying specific attention to any anecdotal or recorded information on turtle populations frequenting the port area and any known nesting sites.

Refer to studies of the turtle populations and consult DERM on historical data for the area, particularly in relation to previously conducted nesting surveys.

The proponent shall use this information to establish the basis for recommendations in relation to the most appropriate management measures to be adopted to minimise the risk of turtle injury or death. Particular reference should be given to the protection of

turtles from boat strike, given the potential increase in boat traffic closer to feeding grounds than the existing port channel.

Benthic macro invertebrates

Benthic macro invertebrate communities likely to be directly or indirectly impacted by the project should be characterised for the assessment of the potential impacts of proposed capital works. Consider the effect of ongoing maintenance activities, including dredging, on benthic fauna.

Reef communities

Describe the reef communities that may be impacted by the proposed development.

Potential impacts and mitigation measures

Discuss the potential impacts of the project on the aquatic ecosystems, including:

- loss of tidal flats on juvenile and adult aquatic species leading to loss of productivity in fish, crustaceans etc
- loss of seagrasses in relation to the extent and regional significance of seagrass communities and associated impact on fisheries, dugongs, turtles etc
- potential impacts associated with dredging and dredge material disposal (e.g. impacts of seagrass, mangroves, corals and benthic fauna)
- 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
- benefits and/or disadvantages to recreational and commercial fishers resulting from provision of infrastructure or other aspects of the proposal
- the impact of creating the reclaimed area and the likely colonisation of the marina and marine structures, including the breakwaters that may partially offset the adverse impacts of the development on marine biodiversity. Discuss the design of the reclamation area and breakwater in relation to *Fisheries Guidelines for Fish-Friendly Structures—Fish Habitat Guideline 006* (Derbyshire 2006) and, where appropriate, demonstrate fish-friendly design features of the proposed infrastructure
- potential impacts from climate change and the project's potential to increase the susceptibility of aquatic ecological communities and species, e.g. coral bleaching.

Describe proposed mitigation actions, including:

- proposed location, type and design of waterway barrier works (both temporary and permanent) that would impact on aquatic resources, particularly fish movement; and provide an appropriately scaled map
- potential mechanism to ensure adequate fish passage is provided at proposed waterway barriers
- strategies for protecting any rare or threatened species
- measures to reduce the impacts on the Australian snubfin dolphin, Indo-Pacific humpback dolphin, turtles and dugongs related to increased commercial use (i.e. boat strike, degraded water quality)

- measures to avoid fish spawning periods, such as seasonal construction of waterway crossings and measures to facilitate fish movements through water crossings
- offsets proposed for unavoidable, permanent loss of fisheries habitat in accordance with *Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss* (Fish Habitat Management Operational Policy 005) (Dixon & Beumer 2002).
- methods to minimise the potential for introducing or spreading weed species or plant disease
- monitoring aquatic biology health, productivity and biodiversity in areas subject to direct discharge
- measures to prevent direct impacts on marine fauna and flora by any dredging works.

Address any actions of the project or likely impacts that require an authority under the relevant legislation including the NC Act and/or the Fisheries Act. Outline how these measures will be implemented in the overall EMP for the project.

5.6 Water resources

5.6.1 Description of environmental values

Describe the existing water resources that may be affected by the project in the context of environmental values, as defined in such documents as:

- the EP Act
- Environmental Protection (Water) Policy 2009 (EPP (Water))
- *Australia and New Zealand Guidelines for Fresh and Marine Water Quality* (Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand 2000)
- *Queensland Water Quality Guidelines 2009* (Department of Environment and Resource Management 2009).

Provide an indication of the quality and quantity of water resources in the vicinity of the project area, describing:

- existing surface and groundwater in terms of physical, chemical and biological characteristics
- existing surface drainage patterns, flows, history of flooding including extent, levels and frequency and present water uses.

Describe the environmental values of the surface waterways (including Ross River and Ross Creek) and groundwater of the affected area in terms of:

- values identified in the EPP (Water)
- physical integrity, fluvial processes and morphology, including riparian zone vegetation and form, if relevant
- any impoundments (e.g. dams, levees, weirs etc.)
- hydrology of waterways and groundwater

- sustainability, including both quality and quantity
- dependent ecosystems
- existing and other potential surface and groundwater users
- water resource plans relevant to the affected catchments.

If the project is likely to use or affect local sources of groundwater, describe groundwater resources in the area in terms of:

- geology/stratigraphy
- aquifer type—such as confined, unconfined
- depth to and thickness of the aquifers
- depth to water level and seasonal changes in levels
- groundwater flow directions (defined from water level contours)
- interaction with surface water
- possible sources of recharge
- potential exposure to pollution
- current access to groundwater resources in the form of bores, springs and ponds (including quantitative yield of water and locations of access).

The groundwater assessment should also be consistent with relevant guidelines for the assessment of acid sulfate soils including spatial and temporal monitoring to accurately characterise baseline groundwater characteristics.

5.6.2 Potential impacts and mitigation measures

Assess the potential impacts of the project on water resource environmental values identified in the previous section. Also, define and describe the objectives and practical measures for protecting or enhancing water resource environmental values, to describe how nominated quantitative standards and indicators may be achieved, and how the achievement of objectives will be monitored, audited and managed. Include the following:

- potential impacts on the flow and the quality of surface and groundwater from all phases of the project, with reference to their suitability for the current and potential downstream uses and discharge licences
- an assessment of all likely impacts on groundwater depletion or recharge regimes
- potential impacts of surface water flow on existing infrastructure, with reference to the EPP (Water) and the *Water Act 2000*
- chemical and physical properties of any wastewater (including stormwater at the point of discharge into natural surface waters), and the toxicity of effluent to flora and fauna
- potential impacts on other downstream receiving environments, if it is proposed to discharge water to a riverine system
- the results of a risk assessment for uncontrolled releases to water due to system or catastrophic failure, implications of such emissions for human health and natural ecosystems, and list strategies to prevent, minimise and contain impacts

- an assessment of the potential to contaminate surface and groundwater resources and measures to prevent, mitigate and remediate such contamination.

Strategies should be adequately detailed to demonstrate best practice management and that environmental values of receiving waters will be maintained to nominated water quality objectives. Describe the monitoring programs that will assess the effectiveness of management strategies for protecting water resources during the construction, operation and decommissioning of the project. Outline how these strategies are incorporated into appropriate sections of the EMP.

5.7 Air quality

5.7.1 Description of environmental values

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 (EPP (Air)) and State Planning Policy 5/10: Air, Noise and Hazardous materials (Department of Environment and Resource Management 2010g).

Discuss the existing air shed environment, both local and regional, including:

- background levels and sources of particulates, gaseous and odorous compounds and any major constituent
- pollutants, including greenhouse gases, that may be generated by the project
- baseline monitoring results, sensitive receptors
- 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.

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

5.7.2 Potential impacts and mitigation measures

Consider the following air quality issues and their mitigation:

- an inventory of air emissions from the project expected during construction and operational activities
- 'worst case' emissions that may occur during operation. If these emissions are significantly higher than those for normal operations, it will be necessary to separately evaluate the worst-case impact to determine whether the planned buffer distance between the facility and neighbouring sensitive receptors will be adequate
- ground level predictions should be made at any site that includes the environmental values identified by the EPP (Air), including any sites that could be sensitive to the effects of predicted emissions
- dust generation from construction activities, especially in areas where construction activities are adjacent to existing road networks or are in close proximity to sensitive receivers
- climatic patterns that could affect dust generation and movement

- vehicle emissions and dust generation along major haulage routes both internal and external to the project site
- human health risk associated with emissions from the facility of all hazardous or toxic pollutants
- impacts on terrestrial flora and fauna.

Detail the mitigation measures together with proactive and predictive operational and maintenance strategies that could be used to prevent and mitigate impacts.

Discuss potential air quality impacts from emissions, with reference to the National Environmental Protection (Ambient Air Quality) Measure 2003 (Cwlth) and the EPP (Air). If an emission is not addressed in these legislative instruments, the emission should be discussed with reference to its risk to human health, including appropriate health-based guidelines/standards.

5.8 Greenhouse gas emissions

5.8.1 Description of environmental situation

Provide an inventory of projected annual emissions for each relevant greenhouse gas, with total emissions expressed in 'CO_2 equivalent' terms for the following categories:

- Scope 1 emissions—means direct emissions of greenhouse gases from sources within the boundary of the facility and as a result of the facility's activities
- Scope 2 emissions—means emissions of greenhouse gases from the production of electricity, heat or steam that the facility will consume, but that are physically produced by another facility

Briefly describe method(s) by which estimates were made.

Use the *National Greenhouse Accounts (NGA) Factors* (Commonwealth of Australia 2010) as a reference source for emission estimates, supplemented by other sources where practicable and appropriate. As a requirement of the NGA factors, estimates should include the loss of carbon sink capacity of vegetation due to clearing and impoundment.

5.8.2 Potential impacts and mitigation measures

Discuss the potential for greenhouse gas abatement measures, including:

- the proposed measures (alternatives and preferred) to avoid and/or minimise direct greenhouse gas emissions
- how the preferred measures minimise emissions and achieve energy efficiency
- any opportunities to further offset greenhouse gas emissions through indirect means including sequestration and carbon trading.

5.9 Noise and vibration

5.9.1 Description of environmental values

Describe the existing noise and vibration environment that may be affected by the project in the context of the environmental values defined by the Environmental

Protection (Noise) Policy 2008. The *Noise Measurement Manual* (Environmental Protection Agency 2000) should be considered and references should be made to the *EPA Guideline: Noise and vibration from blasting* (Environmental Protection Agency 2006) and *Guideline: Planning for noise control* (Environmental Protection Agency 2004).

Identify sensitive noise receptors adjacent to all project components and estimate typical background noise and vibration levels based on surveys at representative sites. Discuss the potential sensitivity of such receptors and nominate performance indicators and standards.

5.9.2 Potential impacts and mitigation measures

Describe the impacts of noise and vibration generated during the construction and operational phases of the project. Noise and vibration impact analysis should include:

- the levels of noise and vibration generated, including noise contours, assessed against current typical background levels, using modelling (such as Environmental Noise Model or SoundPLAN) where appropriate
- impact of noise, including low frequency noise (noise with components below 200 Hz) and vibration at all potentially sensitive receivers (e.g. residences, social and public infrastructure, such as health, recreational and educational facilities, roads, etc) compared with the performance indicators and standards nominated above
- impact on terrestrial and aquatic fauna
- proposals to minimise or eliminate these effects, including details of any screening, lining, enclosing or bunding of facilities, or timing schedules for construction and operations that would minimise environmental harm and environmental nuisance from noise and vibration
- options for sensitive receivers that are otherwise unable to achieve a satisfactory internal noise level for the preservation of health and wellbeing as identified within the EPP (Noise).

Night-time works

Provide details of any night-time work that may be undertaken. Specifically include:

- the reasons why night-time work may be undertaken (e.g. to avoid peak traffic periods, or to undertake work in a rail corridor)
- the likely duration of work (if known)
- the proposed hours of the work
- the nature of the work to be undertaken
- the likely impact on residents and the associated mitigation measures to be undertaken by the proponent
- the methods that will be used to communicate with affected residents.

5.10 Waste

5.10.1 Waste generation

Identify and describe all sources, likely volumes and quality (where applicable) of waste associated with construction, operation and decommissioning of all aspects of the project. Reference is to be made to the *Waste Reduction and Recycling Act 2011* (Qld). Describe:

- waste generated by delivery of material to site(s)
- all chemical and mechanical processes conducted on the construction sites that produce waste
- the amount and characteristics of solid and liquid waste produced on site by the project
- hazardous materials to be stored and/or used on site, including environmental toxicity data and biodegradability.

5.10.2 Waste management

Assess the potential impact of all wastes generated during construction and operation, with regard for best practice waste management strategies in accordance with the Waste Reduction and Recycling Act. Provide details of each waste in terms of:

- the options available for avoidance/minimisation
- operational handling and fate of all wastes including storage
- on-site treatment methods proposed for any wastes
- methods of disposal (including the need to transport wastes off site for disposal) proposed to be used for any trade wastes, liquid wastes and solid wastes
- the potential level of impact on environmental values
- measures to ensure stability of the waste storage areas and impoundments
- methods to prevent seepage and contamination of groundwater from stockpiles and/or storage areas and impoundments
- measures to minimise attraction of vermin, insects and pests
- options available for using recycled materials
- market demand for recyclable waste (where appropriate)
- decommissioning of the construction site.

5.11 Indigenous cultural heritage

Identify areas covered by applications for native title claims or native title determinations, providing boundary descriptions of native title representative body(ies), and whether it is necessary to notify the representative body(ies) or if there is evidence that native title does not exist.

5.11.1 Description of existing Indigenous cultural heritage values

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

Also describe how, in conjunction with the appropriate Indigenous people, the cultural heritage values were ascertained. This could include:

- the results of any Aboriginal cultural heritage survey undertaken
- the DERM Aboriginal Cultural Heritage Register and Database
- any existing literature relating to Indigenous cultural heritage in the project area.

5.11.2 Potential impacts and mitigation measures

Define and describe the objectives and practical measures for protecting or enhancing Indigenous cultural heritage environmental values. Describe how nominated quantitative standards and indicators may be achieved for cultural heritage management, and describe how the achievement of the objectives will be monitored, assessed and managed.

To the greatest extent practicable, significant cultural heritage areas should be avoided by the project. The EIS should provide an assessment of likely effects on sites of Indigenous cultural heritage value, including but not limited to the following:

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

As a minimum, impact assessment, management and protection strategies should satisfy statutory responsibilities and duties of care.

During the EIS process, the proponent should initiate a native title agreement (NT agreement), as defined under the *Aboriginal Cultural Heritage Act 2003* (Qld) (ACH Act) that includes management and protection strategies for Indigenous cultural heritage or a cultural heritage management plan (CHMP) under the ACH Act. An NT agreement or an approved CHMP, in a form which complies with Part 7 of the ACH Act, will ensure that the project meets the Aboriginal cultural heritage duty of care imposed by the ACH Act.

If an NT agreement is not finalised or a CHMP has not been approved when the EIS is submitted to the Coordinator-General, the following must be provided:

- an outline of the draft CHMP or draft plan within the NT agreement that addresses management and protection strategies for cultural heritage, subject to any confidentiality provisions, outlining the position of the relevant parties
- details of the proposed steps and timeframes for finalising the CHMP or NT agreement.

An NT agreement or CHMP should be negotiated between the proponent and the appropriate native title/Indigenous parties and should address and include the following:

- a process for including Indigenous people associated with the development areas in protection and management of Indigenous cultural heritage
- processes for mitigating, managing and protecting identified cultural heritage sites and objects in the project areas, including associated infrastructure developments, during both the construction and operational phases of the project
- provisions for managing the accidental discovery of cultural material, including burials
- a clear recording process to assist initial management and recording of accidental discoveries
- a cultural heritage induction for project staff
- developing a cultural heritage awareness program to be incorporated into the contractor/employee manual and induction manual. This is to be in the form of a plain language, short document that is easy for contractors and staff 'on the ground' to understand
- a conflict resolution process.

5.11.3 Native title

Identify areas covered by applications for native title claims or native title determinations, providing boundary descriptions of native title representative body(ies), and whether it is necessary to notify the representative body(ies) or if there is evidence that native title does not exist.

Identify the potential for native title rights and interests likely to be impacted upon by the project and the potential for managing those impacts by an Indigenous land use agreement or other native title compliance outcomes.

5.12 Non-Indigenous cultural heritage

5.12.1 Description of existing non-Indigenous cultural heritage values

Include a cultural heritage study that describes non-Indigenous cultural heritage sites and places, and their values. Any such study should be conducted by an appropriately qualified cultural heritage practitioner and should include the following:

- review of:
  - the Australian Heritage Places Inventory
  - the Queensland Heritage Register and other information regarding places of potential non-Indigenous cultural heritage significance
  - any local government heritage register
  - any existing literature relating to the heritage of the affected areas
- liaison with relevant community groups/organisations (e.g. local historical societies) concerning places of non-Indigenous cultural heritage significance located or identified

- locations of culturally and historically significant sites, shown on maps, that are likely to be impacted by the project
- a constraints analysis of the proposed development area to identify and record non-Indigenous cultural heritage places.

5.12.2 Potential impacts and mitigation measures

Provide an assessment of any likely effects on sites of non-Indigenous cultural heritage values, including but not limited to the following:

- description of the significance of artefacts, items or places of conservation or non-Indigenous cultural heritage value likely to be affected by the project and their values at a local, regional, state and national level
- recommended means of mitigating any negative impacts on non-Indigenous cultural heritage values and enhancing any positive impacts
- strategies to manage places of historic heritage significance, taking account also of community interests and concerns.

As a minimum, investigation, consultation, impact assessment, management and protection strategies should satisfy statutory responsibilities and duties of care, including those under the EPBC Act and *Queensland Heritage Act 1992*.

6. Social values and management of impacts

6.1 Description of existing social values

Conduct a social impact assessment and consider:

- the social and cultural area, which should include the suburbs intersected by and adjacent to the project
- community engagement
- a social baseline study
- a workforce profile
- potential impacts and mitigation measures
- management strategies.

6.1.1 Social and cultural area

Define the project's social and cultural area of influence, including the local, district, regional and state level as relevant, taking into account the:

- potential for social and cultural impacts to occur
- location of other relevant proposals or projects
- location and types of physical and social infrastructure, settlement and land use patterns
- social values that might be affected by the project (e.g. integrity of social conditions, visual amenity and liveability, social harmony and wellbeing, and sense of community)

- Indigenous social and cultural characteristics, such as native title rights and interests, and cultural heritage
- use of the harbour/port area for commercial and recreational boating and fishing.

6.1.2 Community engagement

Consistent with national and international good practice, and with regard to local and regional strategies for community engagement, the proponent should engage at the earliest practical stage with likely affected parties to discuss and explain the project, and to identify and respond to issues and concerns regarding social impacts.

Describe the community engagement processes used to conduct open and transparent dialogue with stakeholders. Such processes should include, but not limited to, the use of community reference group forums. Include the project's planning and design stages and future operations including affected local and state authorities. Engagement processes will involve consideration of social and cultural factors, customs and values, and relevant consideration of linkages between environmental, economic, and social impact issues.

Discuss engagement strategies and processes, including how complaint resolution will be addressed, for all stages of the project.

6.1.3 Social baseline study

Include a targeted baseline study of the people residing in the project's social and cultural area is required to identify the project's critical social issues, potential adverse and positive social impacts, and strategies and measures developed to address the impacts. The social baseline study should be based on qualitative, quantitative, and participatory methods. It should be supplemented by community engagement processes, and reference relevant data contained in Local and State Government publications, reports, plans, guidelines and documentation, including regional plans and, where available, community plans.

Describe:

- the current social infrastructure including community and civic facilities (e.g. Townsville Yacht Club), services and networks—for definition see *South East Queensland Regional Plan 2005–2026: Implementation Guideline No.5: Social infrastructure planning* (Department of Infrastructure 2007)
- settlement patterns including the names, locations, size, history and cultural aspects of settlement in the social and cultural area
- the identity, values, lifestyles, vitality, characteristics and aspirations of communities in the social and cultural area, including Indigenous communities
- land use and land ownership patterns including:
  - the number of properties directly affected by the project
  - the number of families directly and indirectly affected by the project including Indigenous traditional owners and their families, property owners, and families of workers either living on the property or workers where the property is their primary employment.

- use of the social and cultural area for fishing, recreation, business and industry, tourism, aquaculture, and Indigenous cultural use of flora and fauna.

6.1.4 Workforce profile

Include a profile of the workforce that describes the:

- number of personnel to be employed, the skills base of the required workforce and the likely sources (i.e. local, regional or overseas) for the workforce during the construction and operational phases for each component of the project
- estimated number of people to be employed during construction and operation, and arrangements for their transport to and from the project areas, including proposed use of regional or charter air services.

Estimates should be provided according to occupational groupings and variations in the workforce numbers for the duration of the project and show anticipated peaks in worker numbers during the construction and operation phase of the project.

Provide an outline of recruitment schedules and policies for recruiting workers, addressing recruitment of local and non-local workers including Indigenous workers, people from culturally and linguistically diverse backgrounds and people with a disability

Provide information on the location of other major projects or proposals under study within the social and cultural area, together with workforce numbers.

6.2 Potential impacts

Assess and describe the type, level and significance of the project's social impacts (both beneficial and adverse) on the local and cultural area, based on outcomes of community engagement processes and the social baseline study. Furthermore:

- describe and summarise outcomes of community engagement processes including the likely response of the affected communities, including Indigenous people and other interest groups such as port and marina users including the Townsville Yacht Club
- include sufficient data to enable affected local and state authorities to make informed decisions about the project's effect on their business and plan for the provision of social infrastructure in the project's social and cultural area
- address direct, indirect and secondary impacts from any existing projects and the proposed project including an assessment of the size, significance, and likelihood of these impacts at the local and regional level. Consider the following:
  - key population/demographic shifts; disruptions to existing lifestyles, the health and social wellbeing of families and communities; social dysfunction including alcohol and drugs, crime, violence, and social or cultural disruption due to population influx
  - the needs of vulnerable groups including women, children and young people, the aged and people with a disability
  - Indigenous peoples including cultural property issues

- local, regional and state labour markets, with regard to the source of the workforce. Present this information according to occupational groupings of the workforce. Detail whether the proponent, and/or contractors, is likely to employ locally or through other means and whether there are initiatives for local employment business opportunities
- proposed new skills and training related to the project including the occupational skill groups required and potential skill shortages anticipated
- how much service revenue and work from the project would be likely to flow to the project's social and cultural area
- impact of additional marine transport on recreational boating and fishing
- impacts of construction and operational workforces, their families, and associated contractors on housing and accommodation availability and affordability, land use and land availability. Discuss the capability of the existing housing and rental accommodation, to meet any additional demands created by the project, including direct impacts on Indigenous people.

Evaluate and discuss the potential cumulative social impacts resulting from the project including an estimation of the overall size, significance and likelihood of those impacts. In this context, 'cumulative impacts' is defined as the additional impacts on population, workforce, accommodation, housing, and use of community infrastructure and services, from the project, and other proposals for development projects in the area, which are publicly known or communicated by DEEDI, if they overlap the proposed project in the same timeframe as its construction period.

Discuss the concept of longitudinal cumulative impacts, or 'project fatigue', where the community in the study area has been subjected to a number of large-scale construction projects in recent years.

6.2.1 Mitigation measures and management strategies

For identified social impacts, social impact mitigation strategies and measures should be presented to address the:

- recruitment and training of the construction and operational workforces and the social and cultural implications this may have for the host community, including if any part of the workforce is sourced from outside the social and cultural area
- housing and accommodation issues, in consultation with relevant local authorities and State Government agencies, with proposals for accommodating the project workforce and their families that avoid, mitigate or offset any short- and medium-term adverse effects on housing affordability and availability, including the rental market, in the social and cultural area
- demographic changes in the profile of the region and the associated sufficiency of current social infrastructure, particularly health and welfare, education, policing and emergency services
- adequate provision of education, training and employment for women, people with a disability, and Indigenous peoples via an Indigenous Participation Plan.

Describe any consultation about acceptance of proposed mitigation strategies and how practical management and monitoring regimes are proposed to be implemented.

7. Economics and management of impacts

7.1 Economics

7.1.1 Description of affected local and regional economies

Describe the existing economy in which the project is located and the economies materially impacted by the project. Include:

- a map illustrating the local and regional economies (local government areas) that could be potentially affected by the project
- gross regional product or other appropriate measure of annual economic production
- population
- labour force statistics
- economic indicators
- the regional economy's key industries and their contribution to regional economic income
- sufficient baseline economic data to underpin a comprehensive assessment of the direct, indirect, cumulative, costs and impacts of the project
- the key regional markets relevant to the project:
  - labour market
  - housing and land markets
  - construction services and building inputs market
  - regional competitive advantage and expected future growth.

With regard to the region's key industries and factor prices, provide information on:

- current input costs (wage rates, building costs, housing rent etc.)
- land values in the region by type of use.

7.1.2 Potential impacts and mitigation measures

The potential impacts should consider local, regional, state and national perspectives as appropriate to the scale of the project.

An assessment should use a Regional General Equilibrium Model analysis tool or similar model to measure impacts.

The analysis should describe both the potential and direct economic impacts including estimated costs, if material, on industry and the community, assessing the following:

- property values
- industry output (e.g. large construction projects)
- employment
- commercial fishing

- the indirect impacts likely to flow to other industries and economies from the development of the project. This should also consider the implications of the project for future development
- the distributional effects of the proposal including proposals to mitigate any negative impact on disadvantaged groups.

Strategies for local participation

The assessment of economic impacts should outline strategies for local participation, including:

- strategies for assessing the cost effectiveness of sourcing local inputs from the regional economy during the construction, operation and rehabilitation phases of the project
- employment strategies for local residents including members of Indigenous communities and people with a disability, including a skills assessment and recruitment and training programs to be offered
- strategies responding to relevant government policy, relating to:
  - the level of training provided for construction contracts on Queensland Government building and construction contracts, with regard to the Queensland Government Building and Construction Contracts Structured Training Policy (the 10 per cent policy) (see **http://training.qld.gov.au/industry/10percent-policy.html**)
  - Indigenous employment opportunities, with regard to the Indigenous Employment Policy for Queensland Government Building and Civil Construction Projects—the 20 per cent policy (Department of Employment, Economic Development and Innovation 2008a)
  - development of a Local Industry Participation Plan and other reports in accordance with the Local Industry Policy (Department of Employment, Economic Development and Innovation 2010) in conjunction with the DEEDI Office of Advanced Manufacturing to embrace the use of locally sourced goods and services.

7.2 Sustainable development

Provide a comparative analysis of how the project conforms to the objectives for 'sustainable development'—see the *National Strategy for Ecologically Sustainable Development* (Ecologically Sustainable Development Steering Committee 1992).

Consider the cumulative impacts (both beneficial and adverse) of the project from a life-of-project perspective, taking into consideration the scale, intensity, duration and frequency of the impacts to demonstrate a balance between environmental integrity, social development and economic development.

This information is required to demonstrate that sustainable development aspects have been considered and incorporated during the scoping and planning of the project.

8. Hazard and risk

8.1 Hazard and risk assessment

Describe the potential hazards and risks to people and property that may be associated with the project, which may include but are not restricted to:

- identifying potential hazards, accidents, spillages and abnormal events that may occur during all stages of the project, including possible frequency of occurrence
- identifying all hazardous substances to be used, stored, processed or produced and the rate of usage
- potential wildlife hazards, natural events (reference should also be made to the SPP 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (Department of Local Government and Planning & Department of Emergency Services 2003)) and implications related to climate change
- terrorist attack (refer sections 8.4.1 and 8.5).

Undertake a preliminary risk assessment for all components of the project, as part of the EIS process in accordance with *Australia/New Zealand AS/NZS ISO 31000:2009 Risk management—Principles and guidelines* (Standards Australia & Standards New Zealand 2009). With respect to risk assessment, the EIS should:

- deal comprehensively with external and on-site risks including transport risks
- assess risks during the construction, operational and decommissioning phases of the project
- include an analysis of the consequences of each hazard on safety in the project area, examining the likelihood of both individual and collective consequences, involving injuries and fatalities to workers and to the public
- present quantitative levels of risks from the above analysis.

Provide details on the safeguards that would reduce the likelihood and severity of hazards, consequences and risks to persons, within and adjacent to the project area(s).

Present a comparison of assessed and mitigated risks with acceptable risk criteria for land uses in and adjacent to the project area(s).

Provide a risk management plan.

Cross-reference to sections 8.4.1 and 8.5 below.

8.2 Cumulative risk

The risk analysis is to address the potential impacts that may occur on the normal on-site day-to-day activities during the construction and/or operation of the facilities. Furthermore, determine the level of change that may affect the risk contours of other relevant existing or proposed industrial facilities in the area, as a result of the proposed project (where details of such proposed facilities are provided by DEEDI or otherwise published). Individual risk criteria should be used to limit risks to individual workers and

members of the public. Societal risk criteria should be used to limit risk to the affected population as a whole.

Identify and adopt, where appropriate, any changes to operating or storage procedures that would reduce the possibility of these events occurring, or reduce the severity of the events should they occur.

8.3 Health and safety

8.3.1 Description of public health and safety community values

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

8.3.2 Potential impact and mitigation measures

Define and describe the objectives and practical measures for protecting or enhancing health and safety community values. Describe how nominated quantitative standards and indicators may be achieved for social impacts management, and how the achievement of the objectives will be monitored, audited and managed.

Assess the cumulative effects on public health values and occupational health and safety impacts on the community and workforce from project operations and emissions. Recommend any practical monitoring regimes in this section.

Include relevant consultation with the appropriate regional health service providers.

8.4 Emergency management plan

Present preliminary information on the design and operation of proposed safety/contingency systems to address significant emergency issues delineated in the risk assessment, together with at least the following areas of emergency:

- terrorist attack
- marine collision minimisation
- fire prevention/protection
- leak detection/minimisation
- release of contaminants
- emergency shutdown systems and procedures.

In addition, undertake an assessment of businesses that may be affected in the event of an emergency, including strategies to mitigate the impact on these businesses.

In regard to fires, outline strategies to manage the provision of:

- fire management systems to ensure the retention on site of fire water or other fire suppressants used to combat emergency incidents
- building fire safety measures for any construction or permanent accommodation

- details of any emergency response plans and bushfire mitigation plans under the State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (Department of Local Government and Planning & Department of Emergency Services 2003)
- on-site firefighting equipment provided and the level of training of staff who will be tasked with emergency management activities
- detailed maps showing the plant outline, potential hazardous material stores, incident control points, firefighting equipment, etc
- an outline of any dangerous goods stores associated with the plant operations, including fuel storage and emergency response plans.

Present outlines of emergency planning and response strategies to deal with relevant incidents above, which have been determined in consultation with state and regional emergency service providers, and which show integration of emergency services into the plans.

Present plans for emergency medical response and transport and first aid matters with involvement of the relevant state agencies (such as the Queensland Ambulance Service, Queensland Fire and Rescue Service and Emergency Management Queensland).

8.4.1 Maritime security plan

The emergency management plan is to include a maritime security plan which meets the security requirements included in the:

- *Maritime Transport and Offshore Facilities Security Act 2003* and Maritime Transport and Offshore Facilities Security Regulation 2003 (Cwlth)
- *Transport Security (Counter Terrorism) Act 2008* and Regulations (Qld)
- International Ship and Port Facility Security Code (International Maritime Organization 2003).

A maritime security plan should be submitted as a separate confidential document to the Coordinator-General at the time of submission of the EIS.

8.5 Counter-terrorism and critical infrastructure protection

The Port of Townsville is deemed to be critical infrastructure as defined by the *Queensland Plan for the Protection of Critical Infrastructure from Terrorism* (State of Queensland, 2005), that is:

> Those physical facilities, supply chains, information technologies and communication networks which, if destroyed, degraded or rendered unavailable for an extended period, would significantly impact on the social or economic well-being of Queensland.

Provide information on the design and operation of proposed safety and contingency systems to address the National and Queensland counter-terrorism and critical infrastructure protection legislation, policies and arrangements including:

- *National Counter-Terrorism Plan* (National Counter-Terrorism Committee 2005)

- *Critical Infrastructure Protection National Strategy* (Trusted Information Security Network 2004)
- *Critical Infrastructure Emergency Risk Management and Assurance: Handbook* (Emergency Management Australia 2004)
- *Queensland Counter-Terrorism Strategy 2008–2010* (Department of the Premier and Cabinet 2007)
- *Queensland Infrastructure Protection and Resilience Framework* (Department of the Premier and Cabinet 2005)
- *Queensland Government Information Security Classification Framework* (Department of Public Works 2010)
- *Transport Security (Counter Terrorism) Act 2008* and Regulations
- *Australia/New Zealand AS/NZS ISO 31000:2009 Risk management—Principles and guidelines* (Standards Australia & Standards New Zealand 2009)
- *Handbook: Security Risk Management* (HB 167:2006) (Standards Australia & Standards New Zealand 2006)
- *Business Continuity Management* (HB 221:2004) (Standards Australia & Standards New Zealand 2004)
- *A Practitioners Guide to Business Continuity Management* (HB 292-2006) (Standards Australia 2006a)
- *Executive Guide to Business Continuity Management* (HB 293-2006) (Standards Australia 2006b).

Provide information on the design and operation of the port's operational security plan.

Such information should be provided as a separate confidential document to the Coordinator-General at the time of submission of the EIS.

9. Cumulative impacts

Summarise the project's cumulative impacts and describe these impacts in combination with those of existing or proposed project(s) publicly known or advised by DEEDI to be in the region (including the Townsville Port Marine Precinct project), to the greatest extent practicable. Assess cumulative impacts with respect to both geographic location and environmental values. Explain the methodology used to determine the cumulative impacts of the project, detailing the range of variables considered (including relevant baseline or other criteria upon which the cumulative aspects of the project have been assessed, where applicable).

10. Environmental management plan

Detail the EMPs for both the construction and operation phases of the project. The EMP should be developed from, and be consistent with, the information in the EIS. The EMP must address discrete project elements and provide life-of-proposal control

strategies. It must be capable of being read as a stand-alone document without reference to other parts of the EIS.

The EMP must comprise the following components for performance criteria and implementation strategies:

- the proponent's commitments to acceptable levels of environmental performance, including environmental objectives, performance standards and associated measurable indicators, performance monitoring and reporting
- impact prevention or mitigation actions to implement the commitments
- corrective actions to rectify any deviation from performance standards
- an action program to ensure the environmental protection commitments are achieved and implemented. This will include strategies in relation to:
  - continuous improvement
  - environmental auditing
  - monitoring
  - reporting
  - staff training
  - a rehabilitation program for land proposed to be disturbed under each relevant aspect of the proposal.

The recommended structure of each element of the EMP 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 (e.g. 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).

The proponent's commitments to environmental performance, as described in the EMP, may be included as Coordinator-General's conditions to ensure the commitments are met. Therefore, the EMP is a relevant document for project approvals, environmental authorities and permits, and may be referenced by them.

11. Conclusions and recommendations

Make conclusions and recommendations with respect to the project, based on the studies presented, the EMP and conformity of the project with legislative and policy requirements.

12. References

All references consulted should be presented in the EIS in a recognised format.

13. Appendices

Final TOR for this EIS

Include a copy of the final TOR in the EIS.

TOR cross-reference table

Provide a cross-reference table that links the requirements of each section/subsection of the TOR with the corresponding section/subsection of the EIS, where those requirements have been addressed

Project approvals

Provide a list of the project approvals required by the project.

Consultation report

The report should include the methodology used in the public consultation plan including:

- criteria for identifying stakeholders and the communication methods used (the consultation plan)
- a list of stakeholders identified, including the Commonwealth, Queensland and local government agencies, and/or the affected parties (as defined by the EP Act)
- a summary of the issues raised by stakeholders and the means by which the issues have been addressed
- plans for ongoing consultation to be outlined and included in the EMP.

Study team

List the relevant qualifications and experience of the key study team members and specialist sub-consultants.

Glossary of terms

Provide a glossary of technical terms.

Specialist studies

All reports generated on specialist studies undertaken as part of the EIS are to be included as appendices. These may include, but are not limited to:

- air pollution, noise and vibration
- groundwater and surface water hydrology
- geology and geomorphology
- economic studies and/or cost-benefit analyses
- transport studies
- cultural heritage
- hazard and risk studies
- land use and land capability studies.

Corporate environmental policy

Attach a copy of the proponent's corporate environmental policy and planning framework document.

List of proponent commitments

Provide a list of all commitments made by the proponent in the EIS, together with a reference to the relevant section in the report.

Acronyms and abbreviations

Acronym/ abbreviation	Definition
ACH Act	*Aboriginal Cultural Heritage Act 2003* (Qld)
AHD	Australian height datum
AS/NZS	Australian standard/New Zealand standard
CAMBA	China–Australia Migratory Bird Agreement
CHMP	cultural heritage management plan
CLR	Contaminated Land Register
Coastal Act	*Coastal Protection and Management Act 1995* (Qld)
DEEDI	Department of Employment, Economic Development and Innovation, Queensland
DERM	Department of Environment and Resource Management, Queensland
EIS	environmental impact statement
EMP	environmental management plan
EP Act	*Environmental Protection Act 1994* (Qld)
EPA	former Queensland Environmental Protection Agency
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPP	Environmental Protection Policy (water, air, waste, noise)
ERA	environmentally relevant activity
GBRMP Act	*Great Barrier Reef Marine Park Act 1974* (Cwlth)
HTML	hyper text markup language
JAMBA	Japan–Australia Migratory Bird Agreement
NC Act	*Nature Conservation Act 1992* (Qld)
NGA	National Greenhouse Accounts
NT agreement	native title agreement
PDF	portable document format
PoTL	Port of Townsville Limited
QASSMAC	Queensland Acid Sulfate Soils Management Advisory Committee
QASSIT	Queensland Acid Sulfate Soils Investigation Team
REDD	Regional Ecosystem Description Database
RIA	road impact assessment (report)
ROKAMBA	Republic of Korea–Australia Migratory Bird Agreement
SDPWO Act	*State Development and Public Works Organisation Act 1971* (Qld)
SEWPaC	Australian Government Department of Sustainability, Environment, Water, Population and Communities
SIA	social impact assessment
SPA	*Sustainable Planning Act 2009* (Qld)
The proponent	Port of Townsville Limited
TMR	Department of Transport and Main Roads, Queensland
TOR	terms of reference

VM Act	*Vegetation Management Act 1999* (Qld)

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