The **Coordinator-General**

Dudgeon Point Coal Terminals Project

Terms of reference for an environmental impact statement

June 2012

Queensland Government

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Contents

Introduction

These terms of reference (TOR) set out the matters to be addressed in an environmental impact statement (EIS) for the proposed Dudgeon Point Coal Terminals Project (DPCT, 'the project').

The project proponents for the project are:

- North Queensland Bulk Ports Corporation Ltd (NQBP) (the lead proponent)
- Adani Mining Pty Ltd (Adani)
- Dudgeon Point Project Management Pty Ltd (DPPM).

A fourth proponent is presently being negotiated, to be responsible for design and construction of the rail spur to Dudgeon Point.

The project components to be assessed include:

- two separate new coal terminals on strategic port land at the Port of Hay Point, south of Mackay, supported by new offshore wharves
- a rail connection to the Goonyella rail system, an expansion of the existing tug harbour and supporting infrastructure.

This document is divided into two parts:

(a) About the project

(b) Contents of the EIS.

The TOR must be read in conjunction with *Preparing an environmental impact statement: Guideline for proponents*, which explains:

- the target audience for the EIS
- stakeholder consultation requirements
- document format
- copy requirements.

The guideline is available from **www.projects.industry.qld.gov.au** or from the EIS project manager (refer to Part A, Section 4 for contact details).

Part A. About the project

1. Project summary

The proponents propose to develop:

- two separate new coal export terminals at Dudgeon Point, with a combined export capacity of up to 180 million tonnes per annum (Mtpa) of coal
- six rail loops and train unloading facilities, plus a rail connection to the Goonyella rail system including a rail overpass at Hay Point Road
- offshore wharf facilities for eight ship berths. The wharves will be connected to shore via two jetty structures. Dredging of approximately 13–15 million cubic metres (Mm^3) will be carried out to create berth pockets and a departure apron for ships
- expanded tug facilities to accommodate up to ten extra tug and service berths.

The proposed port terminals site is located on Strategic Port Land (SPL) at Dudgeon Point in the Port of Hay Point, 25 kilometres (km) south of Mackay and 20 km north of Sarina, on the Central Queensland coast. The site is approximately 4 km north-west of the existing coal terminals at the port and 10 km east of the Bruce Highway. NQBP holds approximately 1400 hectares (ha) of land for port use at Dudgeon Point.

The Port of Hay Point is situated close to the beachside localities of Louisa Creek, Salonika and Half Tide, and the rural residential communities of Timberlands and Fenechvale. The Port Limits, as defined in the *Transport Infrastructure Act 1994* (Qld) (TIA), extend to Half Tide Tug Harbour in the south and to Bakers Creek in the north.

While the port is within the Mackay Regional Council (MRC) Local Government Area, port land designated as SPL and port waters are under the planning control of NQBP as the port authority under the TIA.

The port is partly within the Great Barrier Reef World Heritage Area (GBRWHA) and offshore areas overlap with the Great Barrier Reef Marine Park (GBRMP). The proposed port infrastructure (that is, jetties and ship berths) and ship departure path dredging would be located outside the bounds of the GBRMP but other works, including the offshore spoil disposal, may be within the GBRMP and GBRWHA.

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

2. Project proponent

The project has three proponents:

- NQBP
- Adani
- DPPM.

A fourth proponent is presently being negotiated, to be responsible for design and construction of the rail spur to Dudgeon Point.

The lead project proponent is the NQBP, which is a government owned corporation and the port authority under the TIA for the ports of Hay Point, Abbot Point, Mackay and Weipa.

NQBP is responsible for project master planning, coordination of environmental studies, EIS approvals, and common user infrastructure, such as roads, water supply and tug facilities.

Following a public expression of interest process, Adani and Dudgeon Point Project Management Pty Ltd (DPPM) were selected by NQBP as preferred partner proponents for the development of the new coal terminal export facilities at Dudgeon Point.

Adani is an Australian subsidiary of the Adani Group, based in Ahmedabad, India. Adani has a 100 per cent interest in the Carmichael Coal Project (also a declared significant project) located in the Galilee Basin of western Queensland.

DPPM is a new company set up by the Brookfield Infrastructure Group to develop one of the proposed coal terminals.

Adani and DPPM are responsible for the design, construction and operation of the new coal terminals and specific operational approvals.

Contact details for the proponents are:

North Queensland Bulk Ports Corporation Ltd
GPO Box 409, Brisbane QLD 4001
Ph: +61 7 3224 7088
Web: **www.nqbp.com.au**

Adani Mining Pty Ltd
GPO Box 2569, Brisbane QLD 4001
Ph: +61 7 3223 4800
Web: **www.adanigroup.com/coalmining.html**

Dudgeon Point Project Management Pty Ltd
c/o DBCT Management Pty Ltd
PO Box 3128, Waterfront Place, Brisbane QLD 4001
Ph: +61 7 3002 3100
Web: **www.dbctm.com.au/default.aspx**

3. Legislative framework

On 27 October 2011, the then Coordinator-General declared the project to be a 'significant project requiring and EIS' 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.

The declaration of the project as a 'significant project' does not indicate support for or approval of the project by the Coordinator-General or the Queensland Government. Rather, it is a requirement for the project to undergo a rigorous EIS process.

The project was referred to the Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) on 10 January 2012 for a determination as to whether the project constituted a 'controlled action' under the EPBC Act, due to the likely potential impacts on matters of national environmental significance (MNES).

On 7 February 2012, the Australian Government Environment Minister determined that the project is a controlled action under the EPBC Act (decision notice EPBC 2012/6240). The controlling provisions under the EPBC Act are:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- listed threatened species and communities (sections 18 and 18A)
- listed migratory species (sections 20 and 20A)
- Commonwealth marine areas (sections 23 and 24A)
- Great Barrier Reef Marine Park (sections 24B and 24C).

Therefore the project requires assessment and approval under the EPBC Act and the project will require approval from the Australian Government Environment Minister under Part 9 of the EPBC Act before it can proceed.

The Australian Government assessment will be administered by SEWPaC and will occur separately to the state-based assessment.

3.1. Coordinator-General's report

At the conclusion of the EIS process, the Coordinator-General will prepare a report evaluating the EIS (Coordinator-General's report). If the report states conditions under the following Queensland Acts, the Coordinator-General is required to provide the responsible minister(s) with a copy of the report:

- *Mineral Resources Act 1989*
- *Environmental Protection Act 1994* (EP Act)
- *Petroleum and Gas (Production and Safety) Act 2004*
- *Greenhouse Gas Storage Act 2009*.

4. Contact information

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

The Coordinator-General
c/- EIS Project Manager—Dudgeon Point Coal Terminals Project
PO Box 15517
City East Qld 4002
tel + 61 7 3227 8548
fax+ 61 7 3225 8282
email dpct@coordinatorgeneral.qld.gov.au
web www.projects.industry.qld.gov.au

Part B. Contents of the EIS

The EIS should follow the format and content outlined in this TOR; however any changes to the structure should 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 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, operation 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.

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 relevant major projects (of which the proponent should reasonably be aware) that have been, are being undertaken or that have been approved in the area potentially affected by the project, including other additional development to the Port of Hay Point.

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 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.

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 construction and operation environmental management plans (EMPs).

3.6.3. Submissions

Inform the reader how to properly make submissions on the EIS 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 (e.g. material change of use (MCU) applications under SPA).

3.7. Public consultation process

Overview

The public consultation process should provide opportunities for community involvement and education. It may include interviews with individuals, public communication activities, interest group meetings, printed material and other mechanisms to encourage and facilitate active public consultation. The public consultation processes (community engagement) for all parts of the EIS should be integrated.

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

Consultation plan

Develop and implement a comprehensive and inclusive consultation plan with the stakeholder groups identified in section 3.2 of *Preparing an EIS: Guideline for proponents*.

The 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 stakeholders to be targeted
- the types of consultation and communication activities to be undertaken
- timing of activities
- how consultation activities will be integrated with other EIS activities and the project development process
- consultation responsibilities
- communication protocols
- conflict resolution strategies
- reporting and feedback arrangements
- how results of consultation will be considered by the proponent and integrated into the EIS process.

Public consultation report

Include, as an appendix, a public consultation report detailing how the public consultation plan was implemented, and the results. It must include:

- a list of stakeholders identified, including the Australian, Queensland and local government agencies, and/or the affected parties (as defined by the EP Act)
- criteria for identifying stakeholders and methods used to communicate with them
- details of the activities conducted to date and the future consultation strategies and programs, including those during the operation stage of the project (also outlined and included in the project EMPs)
- a summary of the issues raised by stakeholders and the means by which the issues have been addressed
- details of how consultation involvement and outcomes were integrated into the EIS process
- details of how consultation outcomes will be integrated into future site activities (including opportunities for engagement and provision for feedback and action if necessary).

3.8. Project approvals

3.8.1. Relevant legislation, obligations and approvals

List and describe Australian, state and local government legislation, regulations, policies and approvals 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.

Australian Government legislation

Relevant Australian Government legislation may include but is not limited to:

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

Australian Government obligations

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 (Convention on Biological Diversity)
- climate
- wetlands of international importance (Ramsar)
- ecologically sustainable development (National Strategy for Ecologically Sustainable Development)
- *National Assessment Guidelines for Dredging* (Commonwealth of Australia 2009) (NAGD—incorporates sea dumping (London Protocol)).

Australian Government approvals

Identify and outline key Australian Government approvals that may be 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 responsibility)
- approval to dredge within the boundary of the GBRMP under the GBRMP Act (GBRMPA responsibility)
- permit to dispose of dredge material at sea under the *Environment Protection (Sea Dumping) Act 1981* (SEWPaC responsibility).

Queensland legislation

Relevant Queensland Government legislation may include but is not limited to:

- *Aboriginal Cultural Heritage Act 2003*
- *Building Act 1975*
- *Coastal Protection and Management Act 1995* (Coastal Act)
- EP Act
- *Forestry Act 1959*
- *Fisheries Act 1994*
- *Land Act 1994*
- *Land Protection (Pest and Stock Route Management) Act 2002*
- *Marine Parks Act 2004*
- *Maritime Safety Queensland Act 2002*
- *Native Title (Queensland) Act 1993*
- *Nature Conservation Act 1992* (NC Act)
- *Queensland Heritage Act 1992*
- SDPWO Act
- *Strategic Cropping Land Act 2011*
- *Sustainable Planning Act 2009* (SPA)
- TIA
- *Transport Operations (Marine Pollution) Act 1995*
- *Transport Operations (Marine Safety) Act 1994* (TOMSA)
- *Transport Operations (Road Use Management) Act 1995*
- *Transport Planning and Coordination Act 1994*
- *Transport Security (Counter-Terrorism) Act 2008*
- *Vegetation Management Act 1999* (VM Act)
- *Water Act 2000.*

Queensland approvals

Identify and outline key Queensland approvals, for all offshore, onshore and rail components that may be required including but not limited to:

- development permit for MCU—SPA
- development permit for tidal works (includes a dredge management plan (DMP))—Coastal Act
- development permit for operational work within a coastal management district, that is:
  - disposal of dredged spoil or other solid waste material in tidal water—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

- development permit for operational work that is the construction or raising of a waterway barrier work—Fisheries Act
- development permits for operational work to take or interfere with groundwater—Water Act
- development permit for vegetation clearing operational works—VM Act
- development permit for material change of use (MCU) of a premises for an environmentally relevant activity (ERA)—EP Act
  - ERA 8(3)(a)—chemical storage
  - ERA 15—fuel burning
  - ERA 16(1)(d)—extractive and screening activities
  - ERA 16(2)(d)—extractive and screening activities
  - ERA 16(3)(b)—extractive and screening activities
  - ERA 17—abrasive blasting
  - ERA 18(b)—boilermaking or engineering
  - ERA 21—motor vehicle workshop operation
  - ERA 38(2)(a)—surface coating
  - ERA 43—concrete batching
  - ERA 47(a)—timber milling and woodchipping
  - ERA 50(1)(a)—bulk material handling
  - ERA 63(2)(b)(ii)—operating sewage treatment works
- development permit for MCU of a premises for any other ERAs
- carrying out works in a state marine park—Marine Parks Act
- permit to dredge the existing sea channel where it falls within the boundary of a State Marine Park (i.e. the Great Barrier Reef Coast Marine Park)—Marine Parks Act
- operating a facility for a purpose, mooring (GBRMP Zoning Plan 2003)—Marine Parks Act
- licences and permits which may potentially be required under the Water Act:
  - water licence
  - riverine protection permit for destroying vegetation, excavate or place fill in a water course
- allocation of quarry material—Coastal Act
- licence or permit under the NC Act for the disturbance of native flora, fauna or habitats
- carrying out works on state-controlled roads—TIA
- allocation of state land—*Land Act 1994*.

Identify the relevant approval agency for each approval required.

3.8.2. Relevant plans and policies

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. These may include but are not limited to the:

- *Mackay, Isaac and Whitsunday (MIW) Regional Plan 2011–2031* (Department of Local Government and Planning 2012), under SPA
- (ex-) Mackay City (2006) and (ex-) Sarina Shire Planning Schemes, administered by the MRC under SPA
- Draft Mackay Region 200k Planning Scheme, in preparation by the MRC under SPA
- Port of Hay Point Land Use Plan, under the TIA
- environmental protection policies (EPPs, subordinate to the EP Act), including:
  - EPP (Noise) 2008
  - EPP (Air) 2008
  - EPP (Water) 2009
- state planning policies and their supporting guidelines, including:
  - 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 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (Department of Local Government and Planning & Department of Emergency Services 2003)
  - Temporary State Planning Policy 1/11: Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments (Department of Environment and Resource Management 2011e)
- Queensland Coastal Plan State Policy: Coastal Management (Department of Environment and Resource Management 2011d), and State Planning Policy 3/11: Coastal Protection (Department of Environment and Resource Management 2011c)
  - Queensland Coastal Contingency Plan
  - Standards for Hydrographic Surveys within Queensland Waters
- fish habitat policies, administered by the Department of Agriculture, Fisheries and Forestry (DAFF)
- Queensland Biosecurity Strategy 2009–14
- Queensland Skills Plan
- Queensland Local Industry Policy (LIP).

With specific regard to maritime safety, reference the *Maritime Safety Queensland Guidelines for Major Development Proposals* (Department of Transport and Main Roads 2010b).

3.8.3. Environmentally relevant activities

Briefly describe each ERA under the EP Act and associated activities that are to be carried out in connection with the project. Present a detailed description of each ERA in Section 5, 'Environmental values and management of impacts'; and details of the impact on land, water, air, noise and any other relevant environmental values identified as well as a detailed description of the wastes generated from each ERA and their

quantity, characteristics, handling, storage, management and intended treatment or disposal.

4. Project description

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. Project overview

Provide an overview of the project to put it into context. Describe and explain:

- the key components of the project
- how the preferred operating scenario was selected, including details such as cost, environmental impacts, and the operational efficiencies of each option
- 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. Project location

Describe, using maps at suitable scales, the regional and local context of all of the project components 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 of the project
- boundaries and areas of current or proposed land tenures that the project area is or will be subject to, and details of the ownership of that land
- extent of strategic port land and future strategic port land
- location, boundaries and area of the project site coverage, including easement widths and access requirements
- location and area of any proposed buffers surrounding the project areas (for construction and operation)
- location of infrastructure relevant to the project, including but not limited to, the state-controlled road network, local roads, project site access roads, railways (including road/rail crossings), and marine infrastructure such as navigation aids
- location (if known) of discharge and monitoring points, waste storage, and chemical and fuel storage
- location, dimensions, footprint area and volume of ship berth pockets, apron areas and shipping channels to be dredged
- location, dimensions, site coverage area and volume of any optional offshore and onshore dredge spoil disposal sites

- location of natural features such as waterways (for example, rivers, streams, creeks, wetlands and other water bodies), shorelines, significant vegetation and navigation channels
- location of any proposed site offices and workforce accommodation
- views to and from the site, especially from local residential areas.

4.3. Port

4.3.1. Port description

Provide concept and layout plans highlighting proposed structures, plant and equipment associated with port terminal operations. The description of the port and the layout of key components should include, but is not limited to:

- port boundaries
- jetty and wharf alignment
- ship loading equipment
- berths for tugs and other non-bulk carrier vessels
- current ship numbers, sizes, frequency, speed, route and piloting requirements through the Port of Hay Point and the GBRMP for the current Port of Hay Point operations
- offshore ship mooring locations
- location of navigational aids
- ship-sourced pollution management facilities
- any other associated facilities.

4.3.2. Maritime operation

Describe the location and nature of the processes and operations associated with the long-term operation of the project, including:

- a general description of the operations of the coal terminal
- the present and expected increased shipping numbers, sizes, frequency, speed, route and piloting requirements through the Port of Hay Point and the GBRMP for future port operations
- the present and additional number of tugs, location of tug berths and tug operations
- hours of operation
- expected access, navigational and anchorage arrangements
- maintenance dredging operations
- a description of arrangements for long-term maintenance of the marine facilities, (such as ship-sourced pollution management 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 and the like.

- opportunities for future expansion.

4.3.3. Product handling

Describe, and show on plans at an appropriate scale, the proposed methods and facilities to be used for storing coal and for transferring coal from the rail spur to the proposed stockpile and from the stockpile to the export berths.

Discuss any design features of these facilities including the capacity of stockpiling, in-loading and out-loading operations for each stage of the port's development, and bunding of storage facilities.

Describe the nature, sources, location and quantities of all materials to be handled, including storage and stockpiling of coal (see also Part B, Section 4.5.9 of this TOR).

Identify and describe all potential issues due to product handling.

4.3.4. Structures

Describe all structures, including:

- locations and dimensions of buildings and marine infrastructure associated with the port
- location and extent of any proposed breakwater and revetment structures (if required) and the likely construction methodologies
- the likely interface of the port infrastructure with the port road and rail infrastructure
- location and description of structures near or crossing state-controlled roads
- temporary infrastructure to be used for any pre-assembled modules or pre-fabricated units
- modifications that may be needed to accommodate climate change and sea level rise.

Provide maps and figures detailing where permanent or temporary loss of tidal land is likely to occur as a result of buildings and structures.

4.4. Construction

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

Provide an estimate of the number and roles of people to be employed during the pre-construction and construction stages of the project.

Provide the following information on the pre-construction, construction and commissioning of the project including detailed plans where appropriate including:

- approvals required for each stage
- land acquisitions and changes to land tenures (for example, leases, permits-to-occupy, reserves, easements etc.)
- nature, extent and timing for vegetation clearing
- site access
- earthworks

- interference with watercourses, lakes and dams, floodplain and intertidal areas, and wetlands
- site establishment requirements for construction facilities, including access measures, movement of materials and equipment and expected size, source and control of the construction workforce accommodation, services (for example, water, sewerage, telecommunications, energy, waste disposal, recreation) and safety requirements
- removal of pre-existing structures
- temporary works
- upgrade, relocation, realignment, deviation of or restricted access to roads and other infrastructure
- equipment to be used.

4.4.1. Tidal works—dredging and disposal

Dredging

Describe and map the location, area, depth and volume of dredging required for the project. Provide maps showing existing dredged areas, and areas currently approved for dredging, in relation to the proposed dredging.

Provide details of the dredging methods including:

- the dredge equipment, including number and type of vessels
- the expected duration, timing and operation hours of the dredging campaign
- whether, where and how any blasting may be required, including the scale, frequency and duration of the blasting and proposed management measures
- expected vessel movement patterns
- how the dredged material will be managed while being loaded
- the monitoring and treatment of dredged equipment for potential introduced species.

Disposal

Describe proposed disposal options, methods, locations and site characteristics (for example, spoil ground dimensions and capacity), for disposing of capital and maintenance dredge spoil, with reference to the NAGD (Commonwealth of Australia 2009).

Identify the preferred disposal option and explaining how the preferred option was selected, including consideration of the economic benefits and costs associated with the disposal options.

Explain the management of the optional dredge spoil disposal sites during disposal operations.

Discuss disposal options for contaminated material, if required.

Explain the provisions of any previous sea dumping permits for port operations relevant to the project including dates, volumes and existing spoil ground location, capacity and environmental values.

Describe the location, extent and methods of any dredge spoil disposal sites, including any landfill or land reclamation options, addressing the following requirements:

- the boundary of land to be filled or reclaimed by metes and bounds, tied to real property boundaries
- details of estimated commencement, completion, rate of progress and estimated cost of the filling or reclamation
- the location of the landward limit of mean high water spring tide (MHWST), highest astronomical tide, and the coastal management district as declared under the Coastal Act
- existing levels of the land and proposed final levels of landfill or reclamation in relation to the lowest astronomical tide and Australian height datum
- typical cross-section across the land to be reclaimed showing the proposed finished levels and method of protecting the seaward boundary of the site/s from erosion.

Information provided in this section should refer to:

- *Reclaiming land under tidal water* (Department of Environment and Resource Management 2010c)
- *Guideline: Allocation of quarry material* (Department of Environment and Resource Management 2010a)
- relevant policies of the Queensland Coastal Plan (Department of Environment and Resource Management 2012a) relating to reclaiming land.

For additional discussion on dredging and disposal see Part B. section 5.3.2 of this TOR.

4.5. Associated infrastructure

Detail, with the aid of concept and layout plans, requirements for new associated infrastructure or upgrading/relocating existing infrastructure to service the project for the construction and operation stages. Consider infrastructure such as transportation, water supply, energy supply, telecommunications, waste disposal, wastewater and stormwater disposal and sewerage.

4.5.1. Road transport

Provide information on road transportation requirements on local and state-controlled roads for both construction and operations stages, including:

- any proposed new roads to provide access to or within project sites
- existing traffic levels, vehicle types and numbers, and trip lengths for roads surrounding the access points to project sites
- construction traffic, including vehicle types, heavy and oversize loads and number of vehicles
- operational traffic, including vehicle types and numbers
- anticipated times at which movements may occur
- proposed transport routes (including any waterway crossings)

- need for increased road and intersection maintenance and upgrading, including any intersections, waterway crossings and road/rail crossings
- methods of communicating these issues to the public.

More detailed information regarding transport infrastructure will be required in accordance with section 5.10 of this TOR. The EIS should include cross-references between the sections as appropriate.

4.5.2. Rail transport

Provide information on rail transportation and infrastructure requirements in the project area for both construction and operation stages, including:

- the proposed new railway components, including easements and ownership arrangements
- analysis and design plans for any interface with the Goonyella system (in consultation with the Department of Transport and Main Roads (TMR) and QR National
- proposed transport routes of all project-related transport movements associated with rail, including associated infrastructure such as railway crossings
- need for increased rail crossing maintenance and upgrading, in consultation with TMR and QR National. Note: rail crossings should be designed to meet QR National's requirements.
- all rail infrastructure required to be constructed, upgraded, relocated, commissioned or decommissioned in the project area for the construction and/or operation of the project, including the design and construction standards to be met.

More detailed information regarding transport infrastructure will be required in accordance with section 5.10 of this TOR. The EIS should include cross-references between the sections as appropriate.

4.5.3. Maritime support

Provide concept and layout plans, highlighting proposed structures, plant and equipment associated with the construction and operation of the proposed Dudgeon Point barge and Half Tide tug harbour facilities. The description of the maritime support facilities should include but is not limited to:

- port boundaries
- jetty and wharf alignment
- barge ramps
- berths for tugs and other non-bulk carrier vessels
- current shipping activities and movements
- ship numbers, size, frequency, speed and route through the designated shipping channel in the GBRMP
- dredging and dredge spoil disposal requirements (see also section 4.4.1)
- location of navigational aids
- ship-sourced waste reception facilities

- any other associated facilities.

4.5.4. Temporary workforce accommodation

If temporary workforce accommodation is to be provided by the project specifically to be used to accommodate the project workforce, in addition to any existing or proposed independent accommodation options, provide details on the number, size, location (shown on a map), management, proximity to the construction site, and typical facilities for these project temporary workforce accommodation sites.

Options for the location/s of any temporary workforce accommodation camps are to be determined in consultation with MRC.

Information should outline any local government or other regulatory approvals required to establish and operate such camps, including development approvals, building, health and safety, and waste disposal purposes.

4.5.5. Energy

Describe all energy requirements including electricity, natural gas, and/or solid and liquid fuel requirements for the construction and operation of the project.

Detail the location, design and capacity of power generation and transmission infrastructure in the project area for construction and operation. Show the locations of any easements on the infrastructure plan.

Provide details of any proposed generation of renewable energy within the project area.

Briefly describe energy conservation measures in the context of any relevant Australian, state and local government policies.

4.5.6. Water supply and storage

Provide information on the proposed water usage by the project, including:

- water supply design
- the ultimate supply and sources of this supply required to meet the demand for full occupancy of the development
- the quality and quantity of all water supplied to the site during the construction and operation stages based on minimum yield scenarios for water re-use, rainwater harvesting and re-use and bore water volumes
- a water balance analysis
- water storage details (potable and stormwater)
- fire fighting flows required
- any recycling of treated wastewater.

For any approvals required under SPA or the Water Act (if required), report on proposed sources of either allocated or independent water supply to address project requirements (for both construction and operation stages) that does not counteract current water allocations and demands in the region. This assessment is to include

demonstrating an adequate water balance assessment for the project (e.g. during all stages of development and ongoing use, including reasonable predicted low rainfall).

Provide estimated rates of supply from each source (average and maximum rates) and describe proposed water conservation and management measures.

Describe how the project would adhere to the *National Water Quality Management Strategy* (NWQMS) (see **www.environment.gov.au/water/policy-programs/nwqms**). Provide information on how water quality will be managed in accordance with relevant NWQMS guidelines, including:

- *Australian Drinking Water Guidelines* (Commonwealth of Australia 2011)
- *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 2000a)
- *Australian Guidelines for Water Quality Monitoring and Reporting* (Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand 2000b)
- *Guidelines for Groundwater Protection* (Agriculture and Resource Management Council of Australia and New Zealand and Australian and New Zealand Environment Conservation Council 1995)
- the *National Guidelines for Sewerage Systems* series (see **www.environment.gov.au/water/policy-programs/nwqms/#guidelines**)
- the water recycling guidelines series (see **www.ephc.gov.au/taxonomy/term/39**)
- relevant state and local water quality policies.

Determine potable water demand for the project, including the temporary demands during the construction period. Include details of any existing town water supply to meet such requirements. Describe any proposed on-site water supply, storage and treatment for use by the site workforce (including any project temporary workforce accommodation) during construction and operation stages.

Where water supplies require on-site treatment, provide details of any infrastructure used for treatment and how and where any contaminated water (if any is generated) will be disposed of.

Where temporary water supply/treatment infrastructure is required, provide details on requirements and timing.

Where additional water supply is required from the local government supply, provide details on whether additional capacities are required from the MRC water infrastructure and how this will be achieved.

Describe how the water supply system will be managed in circumstances of disaster or disruption to power supplies.

4.5.7. Stormwater drainage and treatment

Detail the sources of stormwater and the quantity, quality and location of discharge to watercourses and the marine environment.

Describe the proposed stormwater drainage system and any proposed treatment, storage, re-use and disposal arrangements, including any off-site services. Provide details on the standard of proposed stormwater treatment systems, including examples of quality improvement devices (for example, sediment removal, gross pollutant traps) and potential discharge points (for example, spread of flow and scour protection).

Provide information on how water quality will be managed in accordance with the relevant NWQMS guidelines, *Water Quality Guidelines for the Great Barrier Reef Marine Park* (Commonwealth of Australia 2010b) and state and local policies and guidelines.

For additional discussion on stormwater drainage and treatment see Part B, section 5.5 of this TOR. The EIS should include cross-references between the sections as appropriate.

4.5.8. Sewerage and wastewater

Describe the sewerage and wastewater infrastructure required by the project, including:

- options assessed for wastewater treatment
- the treatment measures/precautions of any wastewater generated by the project, whether temporary or not, that will be discharged to council sewerage infrastructure so that the sewage will not adversely impact on treatment processes at local government wastewater treatment plants
- measures required to mitigate any risks to the environment from discharges and overflows, with reference to relevant NWQMS guidelines and other state and local water quality policies and guidance
- buffers between disposal and irrigation areas and other use areas, that is, current rural operations of landholders surrounding the proposed rail corridor
- peak design capacity evaluation of the wastewater treatment system and associated infrastructure using equivalent persons as the measure of capacity
- the proposed disposal and re-use of the treated effluent and the management of such use. An irrigation plan should be provided detailing where the use of treated effluent is likely. Details of the likely impacts of treated effluent on groundwater quality should also be provided
- the siting and maintenance regime for the system
- how the development will manage operation of the wastewater treatment and disposal system in circumstances of disaster or disruption to power supplies, including determination of the potential emergency effluent storage that would be required in an extended rain event (one in 50 and one in 100-year) wet weather storage, accounting for climate change.

Address any statutory requirements in relation to ship-sourced pollutants under the *Transport Operations (Marine Pollution) Act 1995* with particular regard to sewage, garbage and oily waste (see Part B, Section 5.9.2).

For additional discussion on sewerage and wastewater infrastructure see Part B, Section 5.5 of this TOR. The EIS should include cross-references between the sections as appropriate.

4.5.9. Waste

Detail the sources and proposed management of solid and liquid wastes including quarantine wastes from shipping, considering the waste hierarchy and the suitability of available waste treatment, recycling and disposal options. Particular attention must be given to the capacity of wastes to generate acidic, saline or sodic conditions.

For additional discussion on waste management see Part B, Section 5.9 of this TOR. The EIS should include cross-references between the sections as appropriate.

4.5.10. Other infrastructure and construction activities

Describe all other infrastructure (for example, telecommunications facilities and temporary workforce accommodation), that need to be constructed, upgraded, relocated, commissioned or decommissioned for the construction and operation of the project. This includes the design and construction standards to be met (e.g. any waterway crossings should be designed to meet the requirements of the Fisheries Act and in consultation with DAFF).

Describe all other 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 stage, including an outline of construction methodologies
- construction inputs, handling and storage including an outline of potential locations for source of construction materials (see also Part B, Section 4.3.3 of this TOR)
- the likely construction methodologies
- earthworks, including fill that may need to be imported to the project site
- sources and quantities of extractive resources required for construction of project components
- pollution control methods that will be used to prevent pollution, including ship-sourced pollution, entering marine areas during the construction
- alternative approaches or the opportunity of obtaining materials from alternative sources (for example, recycled materials, locally produced products etc.)
- 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 by the project during construction, including storage areas.

4.5.11. Commissioning

Describe the commissioning process including the associated environmental impacts.

4.6. Operation

In addition to maritime operations provided for in Part B, Section 4.3.2 of this TOR, describe the location and nature of all other project operational processes to be used

and provide supporting maps, diagrams, photographs and artist's impressions as required.

Provide full details of the operation for all elements of the project, including:

- nature and description of all key operational activities
- a description of the plant and equipment to be employed, including the capacity of the project equipment and operations
- estimated numbers and roles of persons to be employed during the operation stage of the project.

4.7. Decommissioning and rehabilitation

This section should present general strategies and methods for decommissioning and rehabilitation of the environment disturbed by the project.

5. Environmental values and management of impacts

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
- detail the environmental protection and mitigation measures incorporated in the planning, construction, rehabilitation, commissioning, operation and decommissioning of all facets of the project
- 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.

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.

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 measures identified in this section of the EIS should be used to develop the project EMPs (see Part B, Section 11).

5.1. Climate, climate change and natural hazards

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 and natural or induced hazards. Provide a risk assessment and management plan detailing these potential threats to the construction and operation of the project.

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

Include an assessment of climate change risks and possible adaptation strategies, as well as 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.

It is recognised that predictions of climate change and its effects have inherent uncertainties, and that a balance must be found between the costs of preparing for climate change and the uncertainty of outcomes. Proponents should use their best efforts to incorporate adaptation to climate change in their EIS and project design.

5.2. Land

5.2.1. Land use and tenure

Description of environmental situation

Identify, with the aid of maps:

- land tenures, noting tenures of special interest such as protected areas and reserves, easements, stock routes, and existing and proposed power, water, gas, road and rail infrastructure
- existing land uses and facilities surrounding the project
- location of the project in relation to residential, commercial, industrial, farming and recreational areas
- location of the project in relation to sensitive environmental areas (as detailed in Part B, Section 5.4.1 of this TOR).

Potential impacts and mitigation measures

Describe the potential changes to existing and potential land uses of the project site and adjacent areas due to the construction and operation of the project.

Describe any proposed or potential changes to land tenure or designation, and the effect of such changes on approval requirements and applicable legislation, policy, or code provisions. In particular, describe the following:

- impacts on and strategies for mitigation, for key land resources including:
  - good quality agricultural land—State Planning Policy 1/92: Development and the Conservation of Agricultural land (Department of Housing, Local Government and Planning and Department of Primary Industries 1992) and *Planning guidelines: The identification of good quality agricultural land* (Department of Primary Industries & Department of Housing, Local Government and Planning 1993)
  - strategic cropping land—State Planning Policy 1/12: Conservation of Strategic Cropping Land (Department of Environment and Resource Management 2012b), where exemptions for Strategic Port Land do not apply
  - extractive resources—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), especially with respect to key resource areas defined by that policy and guideline
  - potential residential (including rural residential), commercial and industrial land
- possible effects and constraints on town planning and port planning objectives and controls, including local government zoning and strategic plans, and port authority zoning and development guidelines
- opportunities and constraints to future residential and industrial uses in the vicinity of the project site
- management of the immediate environs of the project including construction and transport corridor buffer zones
- proposed land use changes in any areas of high conservation value and information on how easement widths and vegetation clearance in environmentally sensitive areas will be minimised
- potential issues involved in proximity and/or co-location of other current or proposed infrastructure services.

5.2.2. Scenic amenity and lighting

Description of environmental values

Detail the existing scenic and 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 local residential areas
- focal points, landmarks, waterways and other features contributing to the visual quality of the area and the project sites
- character of the local and surrounding areas including vegetation and land use.

At a level of detail appropriate to the scale of the project, describe the relevant geomorphology, supported by illustrative mapping highlighting any significant features associated with environmental values.

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, jetties and berths, and other structures during all stages of the project as it relates to the surrounding landscape. This should include views from:

- places of local residence, work and recreation
- road, cycleways and walkways
- other sensitive social places, such as educational and childcare facilities
- the air
- other known vantage points.

Use sketches, diagrams, computer imaging/simulation and photographs where possible to portray the near and far views of the completed structures and their surroundings from local residential areas.

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 impacts including, but not limited to:

- the visual impact of night operations and maintenance
- the effects of lighting on residents
- the potential impact of increased vehicular traffic
- the effects of lighting on terrestrial and marine fauna and wildlife habitats.

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

5.2.3. 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 Australian height datum. 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, including offshore structures and areas proposed to be dredged.

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 and operation, address the potential for significant finds.

Survey, describe and map the soils of sites affected by the project at a suitable scale in according to the *Guidelines for Surveying Soil and Land Resources* (McKenzie et al. 2008) and *Australian soil classification* (Isbell & CSIRO 2002).

Provide information on the physical and chemical properties of the materials that may influence erosion and water quality, and the discuss stability and suitability of soils for the construction of project components.

Assess the potential for acid sulfate soils in accordance with:

- Queensland Acid Sulfate Soil Technical Manual (see: **www.derm.qld.gov.au/land/ass/products**)
- 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).

Assess each soil's agricultural land suitability in accordance with:

- *Guidelines for agricultural land evaluation in Queensland* (Department of Primary Industries 1990)
- *Planning guidelines: the identification of Good Quality Agricultural Land* (Department of Primary Industries & Department of Housing, Local Government and Planning 1993)
- State Planning Policy 1/92: Development and the Conservation of Agricultural Land (Department of Primary Industries & Department of Housing, Local Government and Planning 1992).

Identify any areas of land within the project study area identified as strategic cropping land or potential strategic cropping land (SCL) as identified by the *Strategic Cropping Land Act 2011* (Qld)(SCL Act) trigger maps (see **www.derm.qld.gov.au/land/planning/strategic-cropping/mapping.html**)
Identify any exemptions under the SCL Act or State Planning Policy 1/12: Conservation of Strategic Cropping Land (Department of Environment and Resource Management 2012b) that apply to Strategic Port Land.

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:

- any land units requiring specific management measures, and the nature of those management measures
- 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.

Describe measures to manage soils and mitigate impacts for all site earthworks and construction activities.

Assess the likely soil erosion effects resulting from wind, water and removing vegetation.

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

- *Best Practice Erosion and Sediment Control* (International Erosion Control Association Australasia 2008)
- *Guideline: EPA Best Practice Urban Stormwater Management—Erosion and Sediment Control* (Environmental Protection Agency 2008a)
- preventing soil loss in order to maintain land capability/suitability
- preventing degradation of local waterways
- details of an erosion monitoring program.

Discuss the potential for acid generation through disturbance of acid sulfate soils during earthworks, dredging and disposal, and construction.

Should action criteria be triggered by acid generating potential as a result of testing, outline management measures in an acid sulfate soils management plan (ASSMP) prepared in accordance with:

- Queensland Acid Sulfate Soil Technical Manual (see: **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 and Department of Local Government and Planning 2002b).

Append an outline of the ASSMP to the EIS, including the structure, potential monitoring strategies and a likely timeframe for development.

Identify any areas within the project footprint likely to temporarily or permanently impact SCL. Where areas of identified SCL are likely to be permanently alienated by the project, the proponent should discuss how to undertake the SCL assessment process, defined by the SCL Act, with Department of Natural Resources and Mines (DNRM) and DAFF staff.

5.2.4. Land contamination

Description of environmental values

Discuss the potential for land contamination within the project area from existing and past uses, based on land use history and the nature and quantity of any contaminants. 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.

Identify and describe all potential issues concerning land contamination from the project including waste, coal storage and handling, and chemical spills.

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 *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.

5.3. 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 EPPs.

Identify actions associated with the project that are assessable development within the coastal zone and will require assessment under the provisions of the Coastal Act.

Assess the project's consistency with the Queensland Coastal Plan (Department of Environment and Resource Management 2012a), including State Planning Policy 3/11: Coastal Protection (Department of Environment and Resource Management 2011c) and its associated guideline, and the State Policy: Coastal Management (Department of Environment and Resource Management 2011d).

5.3.1. Hydrodynamics and sedimentation

Description of environmental values

Assess the physical and chemical characteristics of sediments within the littoral and marine zone 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 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.

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

Potential impacts and mitigation measures

Describe the potential changes to the hydrodynamic processes and local sedimentation resulting from the construction and operation of the project, including dredging and dredge spoil disposal. This should include:

- impacts on tidal flows and water levels
- changes to sediment transport patterns.

This assessment should also discuss the potential impacts associated with extreme events such as storm tide flooding (see also Part B, Section 8.3 of this TOR). 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.

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.

5.3.2. Coastal water quality

Description of environmental values

Provide baseline information on water quality of coastal waters and areas potentially affected by sediment run-off or dredging. This information should include (but is not

necessarily limited to) general physical and chemical water quality parameters such as dissolved oxygen, pH, metals and metalloids, nutrients (organic carbon, nitrogen, phosphorus and silicate), temperature, salinity, hydrocarbons, contaminants and turbidity/light attenuation, photosynthetically active radiation (PAR), phytoplankton pigment analyses, pathogens and parasites.

Define and describe the environmental values and water quality objectives, referring to:

- EPP (Water) 2009
- *Queensland Water Quality Guidelines* (Department of Environment and Resource Management 2009b)
- *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).

Dredging and disposal

In the context of the DMP,required for development approval under the Coastal Act, describe the method, location and issues associated with both the dredging and disposal of dredge spoil material, including the following:

- Undertake two- and three-dimensional sediment plume modelling (as required), including likely dispersion and re-suspension from both dredging operations and dredge spoil disposal during the full range of hydrodynamic conditions and weather events (including 'worst case' conditions). Include a justification of the assumptions and parameters used to model 'worst case' conditions, including data source, quality and any uncertainties.
- Describe the proposed marine water quality monitoring regime (receiving environment monitoring program—REMP) before, during and after dredging and disposal, including any required triggers for actions established by a DMP. Provide information describing the estimated extent of mixing zones for contaminants of potential concern.

Provide details of the physical and chemical qualities of likely dredged materials, including the size grading, potential acid sulfate soils (identifying sulfidic or organic sources of acidity if detected), contaminants, nutrients, metals and metalloids, and indurated (hardened or cemented) layers.

Obtain this information by implementing a sediment sampling and analysis plan (SAP) prepared in accordance with the NAGD (Commonwealth of Australia 2009). The EIS must also include a SAP implementation report prepared in accordance with the NAGD and other relevant guidelines.

Where possible, present this information as a map of sediment types based on their physical and chemical properties and include depth profiles.

The criteria used to assess the results of acid sulfate soils (ASS) screening tests, to identify actual ASS (AASS) or potential ASS (PASS), must be taken from the Queensland Acid Sulfate Soil Technical Manual. The action criterion from the 'chromium' suite of tests, which triggers a requirement for ASS disturbance to be

managed, should be derived from the *Acid Sulfate Soils Laboratory Methods Guidelines* (Ahern et al. 2004) and the *Soil Management Guidelines* (Dear et al. 2002).

Assessment of marine sediments should be undertaken in accordance with the NAGD. 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.

Note: Dredging with disposal of spoil on land (above the MHWST) requires an allocation of quarry material, under the provisions of the Coastal Act, prior to application for tidal works approval under SPA.

Potential impacts and mitigation measures

Describe the potential environmental impacts caused by the project on coastal water and sediment quality, and associated management and mitigation measures, including:

- potential impacts associated with constructing and operating the coastal and marine facilities
- in the context of the DMP, potential impacts due to dredging and dredge material disposal, including disturbance of fine-grained sediments (for examples, metals, nutrients, PASS or contaminant release), reduced light attenuation and additional sedimentation on coral reefs and seagrasses
- potential accidental discharges of contaminants during construction and operation of the coastal and marine facilities
- release of contaminants from marine structures and vessels, including potential for introducing marine pests
- stormwater run-off from the coastal facilities and associated infrastructure
- flooding of local watercourses and other extreme weather events.

Provide management strategies for dredging, loading and spoil disposal, including any required trigger levels for management actions linked to quantitative measurements of water quality.

For any onshore dredge spoil disposal options, provide a detailed assessment, with appropriate staging plans. The assessment should demonstrate the quality of the water discharged from dredge spoil disposal areas will meet standards necessary to achieve water quality objectives and therefore maintain receiving water environmental values throughout the period of dredge spoil disposal on land. Consideration should be given to:

- quantities of tailwater likely to be generated from dredging activities
- the settling rate of fine sediments from all dredge material types
- the residence time within settling ponds prior to discharge (related to dredge pumping rate, ratio of solids to water in spoil, settling rates, available capacity of the disposal and settling areas, potential bulking factor, intensity and duration of rainfall events with consideration given to the worst case scenario for these factors)
- source of material for bunds and bund wall stability
- measures to limit channelling and sediment re-suspension in settling ponds

- measures to limit erosion and sediment re-suspension in discharge channels
- contingency measures in the event that discharge limits are exceeded
- management, maintenance and landscaping of the disposed dredge spoil's final form.

Describe how nominated water quality objectives will be monitored, audited and managed, with reference to a REMP.

5.4. Nature conservation

Detail the existing nature conservation values that may be affected by the proposal in terms of:

- biological diversity, including state and Commonwealth listed species
- habitats of endangered, vulnerable, near-threatened (EVNT) and migratory species
- aquatic and terrestrial ecosystems
- integrity of ecological processes
- conservation of resources.

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 project area, and seasonal variation in fauna populations such as migratory birds and marine megafauna.

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.

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.

5.4.1. Sensitive environmental areas

Description of environmental values

Identify areas that are environmentally sensitive within the study area in proximity to the project site 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 Australian Government legislation and policies on threatened species and ecological communities.

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

- important habitats of species that are listed under the NC Act as 'extinct in the wild' or EVNT
- regional ecosystems (REs) listed as 'endangered' or 'of concern' under the VM Act

- good representative examples of remnant REs or REs 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**
- areas or features identified as state significant biodiversity values, pursuant to the Queensland Biodiversity Offset Policy (version 1) (Department of Environment and Resource Management 2011a)
- 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. turtles, dugong, dolphins and whales)
- sites containing common species that represent a distributional limit
- sites that contain feeding, breeding, resting areas for populations of 'special least concern species' as defined under the Nature Conservation (Wildlife) Regulation 2006 (Qld)
- areas which are important or potentially important as migratory corridors or for population connectivity
- sites of high biodiversity that are of a suitable size or with connectivity to corridors or protected areas to ensure survival in the longer term; such land may contain:
  - natural vegetation in good condition or other habitat in good condition (for example, 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
- sites 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
- protected areas that have been proclaimed under the NC Act or Marine Parks Act or are under consideration for proclamation
- areas of environmental significance as defined by the Queensland Coastal Plan (Department of Environment and Resource Management 2012a)
- areas of major interest, or critical habitat declared under the NC Act or high nature conservation value areas or areas vulnerable to land degradation under the VM Act.

Potential impacts and mitigation measures

Discuss the impact of the project on species, communities and habitats of local, regional, state or national significance in environmentally sensitive 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 the habitats of listed species
- mitigating impacts through rehabilitation and restoration including, where relevant, a discussion of any relevant previous experience or trials of the proposed rehabilitation
- replacing or offsetting 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 an endangered ecological 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.

Assess how the project meets the requirements of Temporary State Planning Policy 1/11: Protecting Wetlands of High Ecological Significance in Great Barrier Reef Catchments (Department of Environment and Resource Management 2011e).

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:

- State Policy for Vegetation Management (Department of Environment and Resource Management 2009a)
- Queensland Biodiversity Offset Policy (Department of Environment and Resource Management 2011a)
- Policy for Vegetation Management Offsets (Department of Environment and Resource Management 2011b)
- Fish Habitat Management Operational Policy FHMOP 005: Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss (Department of Primary Industries 2002).

Describe any departure from no net loss of ecological values.

Outline how all management measures for environmentally sensitive areas will be implemented in the project EMPs.

5.4.2. Terrestrial flora

Description of environmental values

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
- 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
- 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 EIS.

Provide vegetation mapping for all relevant project components. 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 project area at an appropriate scale (maximum 1:10 000), with reference to mapping produced from aerial photographs and ground-truthing, showing the following:

- location and extent of vegetation types using the RE type descriptions in accordance with the REDD
- location of vegetation types of conservation significance based on RE types and occurrence of species listed as protected plants under the Nature Conservation (Wildlife) Regulation 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 NC Act
- any plant communities or species of cultural, commercial or recreational significance
- the location of any horticultural crops in the vicinity of the project area

- location and abundance of any known exotic or weed pest plant 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.

Describe the location and extent of listed plants (including marine plants) and significant habitats within any land to be filled or reclaimed.

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.

Potential impacts and mitigation measures

Describe the potential environmental impacts 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.

For 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
- actions of the project or likely impacts that require an authority under the NC Act, or would be assessable development for the purposes of the VM Act
- 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 that increase the susceptibility of ecological communities and species to the impacts of climate change.

Weed management strategies are required for containing existing weed species (for example, parthenium and other declared plants) and ensuring no new declared plants are introduced to the area. Refer to the MRC draft pest management plan 2011–2014 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 project EMPs.

Outline how all flora management measures will be implemented in the project EMPs.

5.4.3. 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 EVNT
- habitat requirements and sensitivity to changes, including movement corridors and barriers to movement
- 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)
- 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
- the existence of feral or introduced animals including those of economic or conservation significance.

Identify any species listed by the EPBC Act and the NC Act occurring in the project area.

Identify any species listed by the Department of National Parks, Recreation, Sport and Racing (DNPRSR) 'Back on Track' species prioritisation methodology (see **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 DNPRSR in a format compatible with the Wildlife Online database for listed threatened species (see **www.derm.qld.gov.au/wildlife-ecosystems/wildlife/wildlife_online/index.html**).

Potential impacts and mitigation measures

Assess the potential impacts the project may have on terrestrial fauna, relevant wildlife habitat and other fauna conservation values, including:

- impacts due to loss of habitat, range, food supply, nest sites, breeding or recruiting potential, 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 (e.g. species recovery plans) or policy or international obligations (that is, 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.

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 MRC draft pest management plan 2011–2014 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 project EMPs.

Outline how all fauna management measures will be implemented in the project EMPs.

5.4.4. 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 project, 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 and any associated wetlands
- any EVNT aquatic and 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 area
- aquatic plants including native and exotic/weed species

- presence and distribution of known marine pests
- aquatic and benthic substrate
- 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 Department of Environment and Heritage Protection 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, corals and marine 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.

Marine fauna

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

Consult DNPRSR and GBRMPA and undertake a desktop review of information on the turtle communities of the study area, paying specific attention to any anecdotal or recorded information on turtle populations frequenting the port area and any known nesting sites. Describe the turtle species in proximity to the project area.

The proponent should monitor turtle nesting along beaches near the proposed project area in the turtle nesting seasons for turtle species occurring in the area.

Undertake a baseline study on noise in the marine environment.

Fish habitat

Describe the nature, extent and condition of fish habitats that have the potential to be impacted, with particular reference to fish nursery habitat. The location and density of marine plants should be mapped at an appropriate scale.

Show the location of any declared fish habitat areas proximate to the proposed development site.

Benthic macro invertebrates

Describe the benthic macro invertebrate communities likely to be directly or indirectly impacted by the project. Consider the effect of capital works and 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 and marine megafauna etc.
- potential impacts associated with dredging and dredge spoil disposal (for example, impacts to seagrass, mangroves, corals and benthic habitat 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
- potential impacts to marine megafauna of dredging, disposal and the construction of marine structures, specifically relating to lighting, noise and vibration (including piling and any blasting) and vessel traffic
- the likely colonisation of the marine structures that may partially offset the adverse impacts of the development on marine biodiversity. Discuss this 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, for example, coral bleaching.

Describe proposed mitigation actions, including:

- proposed location, type and design of any waterway barrier works (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 any proposed waterway barriers
- strategies for protecting any rare or threatened species
- measures to monitor and reduce the impacts on marine megafauna related to increased recreational and commercial vessel traffic (that is, boat strike, degraded water quality)
- measures to monitor and reduce the impacts on marine megafauna related to construction and operation dredging lighting, noise, vibration and vessel movement

- 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
- measures for monitoring and managing exotic marine pests and bio-fouling risks in accordance with national standards
- monitoring aquatic biology health, productivity and biodiversity in areas subject to direct discharge
- measures to prevent direct and indirect impacts on marine fauna and flora by any dredging and dredge spoil disposal works
- special measures to be taken if blasting is required.

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 all aquatic ecology management measures will be implemented in the project EMPs.

5.5. Water resources

5.5.1. Description of environmental values

Describe the quantity and quality of water resources in the vicinity of the project area, including:

- 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
- 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.

Describe the environmental values and water quality objectives of the surface waterways and groundwater of the affected area in terms of:

- 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 and Agriculture and Resource Management Council of Australia and New Zealand 2000)
- *Queensland Water Quality Guidelines* (Department of Environment and Resource Management 2009b)

- physical integrity, fluvial processes and morphology, including riparian zone vegetation and form, if relevant
- any impoundments (for example, dams, levees, weirs)
- 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.

Groundwater

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

- geology and 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 ASS, including spatial and temporal monitoring to accurately characterise baseline groundwater characteristics.

Review the quality, quantity and significance of groundwater in the project area, together with groundwater use in neighbouring areas. Refer to relevant legislation or water resource plans for the region. The review should also provide an assessment of the potential take of water from the aquifer and how current users, the aquifer itself and any connected aquifers will be affected by any take of water.

The review should include a survey of existing groundwater supply facilities (bores, wells, or excavations) to the extent of any environmental harm. The information to be gathered for analysis is to include:

- location
- pumping parameters
- draw down and recharge at normal pumping rates
- direction of underground flows
- seasonal variations (if records exist) of groundwater levels.

Develop a network of observation points that would satisfactorily monitor groundwater resources both before and after commencement of operations.

The data obtained from the groundwater survey should be sufficient to enable specification of the major ionic species present in the groundwater, pH, electrical conductivity and total dissolved solids.

5.5.2. Potential impacts and mitigation measures

Assess the potential impacts of the project on water resource environmental values identified in the previous section.

Assess the hydrological impacts of the project on surface water and water courses, particularly with regard to stream diversions, scouring and erosion, and changes to flooding levels and frequency of flooding both upstream and downstream of the project. If flooding levels will be affected, modelling of afflux should be provided and illustrated with maps. Where appropriate, ensure flood studies reference 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).

If required, discuss the need or otherwise for licensing of any dams (including referable dams) or creek diversions, under the Water Act and/or *Water Supply (Safety and Reliability) Act 2008*. Water allocation and water sources, including impacts on existing water entitlements (including water harvesting), should be established in consultation with DNRM.

Define and describe the practical measures for protecting or enhancing water resource environmental values, to describe how nominated quantitative standards and indicators may be achieved. Include the following:

- potential impacts on the flow, quantity and the quality of surface water and groundwater from all stages of the project
- an assessment of the potential to contaminate surface and groundwater resources and measures to prevent, mitigate and remediate such contamination.

Describe how nominated water quality objectives will be monitored, audited, reported and managed.

Water management 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.

Outline how all water resource management measures will be implemented in the project EMPs.

Wastewater, stormwater, sewerage and water storage systems

Describe the proposed wastewater, stormwater and sewerage systems and the proposed storage and disposal arrangements.

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

Where dams, weirs or ponds are proposed, investigate the effects of predictable climatic extremes (storm events, floods and droughts) on:

- the capacity of the water storages (dams, weirs, ponds) and the ability of these storages to retain contaminants
- the structural integrity of the containing walls
- relevant operating regime
- the quality of water contained
- flows and quality of water discharged.

The design of all water storage facilities should follow the technical guidelines on site water management.

Discuss the mitigation options and the effectiveness of mitigation measures, with particular reference to water quality, sediment, acidity, salinity and other emissions of a hazardous or toxic nature to human health, flora or fauna.

Groundwater

With regard to groundwater resources, describe and assess the potential environmental impact caused by the project (and its associated project components) to local groundwater resources, and the range of project responses, including:

- an assessment of all likely impacts on groundwater depletion or recharge regimes
- the response of the groundwater resource to the progression and finally cessation of the proposal
- the impact of the project on the local groundwater regime caused by the altered porosity and permeability of any land disturbance
- the potential to contaminate groundwater resources
- potential groundwater impacts from the disturbance of ASS
- the potential for groundwater-induced salinity
- impacts on groundwater-dependent plants and animals
- measures to avoid, or where avoidance is not possible, mitigate and remediate any potential groundwater impacts.

5.6. Air quality

5.6.1. 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 2010b).

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, in particular coal dust
- pollutants, including greenhouse gases, that may be generated by the project
- baseline monitoring results, sensitive receptors (including temporary workforce accommodation)

- 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.

5.6.2. Potential impacts and mitigation measures

Discuss potential air quality impacts from emissions, with reference to the National Environmental Protection (Ambient Air Quality) Measure 2003 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.

Consider the following air quality issues and their mitigation:

- an inventory of air emissions from the project expected during construction and operational activities
- dust and odour generation from construction activities, especially in areas where construction activities are adjacent to existing road networks or are in close proximity to sensitive receivers
- cumulative contribution of air emissions generated during the construction and operation stages of the project, with regard to current typical background levels
- maximum 24-hour emissions that may occur during operation, in particular coal dust from rail operations, and port stockpile and handling facilities. If these emissions are significantly higher than those for normal operations, it will be necessary to separately evaluate the maximum 24-hour impact to determine whether:
  - the planned buffer distance between the facility and neighbouring sensitive receptors will be adequate
  - emissions, especially coal dust, may have a significant negative impact on terrestrial and marine flora or fauna and sensitive environmental areas (for example, the Mount Hector Conservation Park)
- 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
- 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
- implementation of QR National's Coal Dust Management Plan 2010
- 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 operation and maintenance strategies that could be used to prevent and mitigate impacts.

5.7. Greenhouse gas emissions

5.7.1. 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 Australian Government Department of Climate Change and Energy Efficiency's *National Greenhouse Accounts (NGA) Factors* (Commonwealth of Australia 2010a) 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.

5.7.2. 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.

5.8. Noise and vibration

5.8.1. 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 (EPP (Noise)).

Refer to:

- *Noise Measurement Manual* (Environmental Protection Agency 2000)
- *Guideline Noise and Vibration from Blasting* (Environmental Protection Agency 2006)
- *Guideline: Planning for Noise Control* (Environmental Protection Agency 2004).

Identify sensitive noise receptors (including temporary workforce accommodation) 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.

5.8.2. Potential impacts and mitigation measures

Describe the impacts of noise and vibration generated during the construction and operation stages of the project, with particular attention given to operational rail noise impacts to local residential areas. 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 where appropriate
- cumulative contribution of noise and vibration generated during the construction and operation stages of the project, with regard to current typical background levels
- impact of noise, including low frequency noise (noise with components below 200 Hz) and vibration at all potentially sensitive receivers compared with the performance indicators and standards nominated above
- impact on terrestrial, avian 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
- 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.

5.9. Waste

5.9.1. 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. Refer 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 used on site, including environmental toxicity data and biodegradability
- generation of ship-sourced wastes (see also Part B, Section 5.10.5).

5.9.2. 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 waste management strategies (including reduction, re-use, recycling, storage, transport and disposal of waste). Demonstrate that waste minimisation and cleaner production techniques and designs will be implemented to prevent or minimise environmental impacts when selecting processes, equipment and facilities.

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.

Provide details of cleaner production waste management planning, especially how these concepts will be applied to prevent or minimise environmental impacts at each stage of the proposal. Discuss measures to improve natural resource use efficiency (for example, energy and water), integrated processing design, any co-generation of power and by-product re-use as shown in a material/energy flow analysis.

Assess the hazardous nature of any structures or materials found on site that need to be handled accordingly with relevant legislation (including the *Public Health Act 2005* (Qld) and *Workplace Health and Safety Act 2011* (Qld)), national codes of practice (Code of Practice for the Management and Control of Asbestos in Workplaces NOHSC:2018(2005) and Code of Practice for the Safe Removal of Asbestos, 2nd Edition NOHSC: 2002(2005)).

Address the requirements of the *Transport Operations (Marine Pollution) Act 1995* (Qld) and the Transport Operations (Marine Pollution) Regulation 2008 as they apply to ship-sourced pollution.

5.10. Transport

Present the transport assessment in separate reports for each project-affected mode (road, rail, sea and air) as appropriate for the construction and operation stages of the project. 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.

5.10.1. Existing infrastructure

Describe the extent, condition, volumes and capacity of the existing transport infrastructure on which the project will depend (refer also to Part B, Section 4.5).

5.10.2. Transport tasks and routes

Describe:

- expected volumes of project inputs and outputs of transported raw materials, wastes, hazardous goods and finished products for all stages of the project
- how identified project inputs and outputs will be moved through the local and regional transport network (volume, composition, mode, trip timing and routes) during the construction and operation stages of the project
- traffic generated by personnel associated with the project (volume, composition, timing and routes)
- arrangements for workforce transport to and from the project areas, including proposed use of regional or charter air services
- likely heavy and oversize/indivisible loads (volume, composition, timing and routes), highlighting any vulnerable bridges and structures along proposed routes.

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).

5.10.3. Potential impacts and mitigation measures

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

For inclusion in an RIA, assess project impacts, in consultation with relevant transport authorities and providers, for example TMR, MRC, Queensland Police Service, Queensland Rail, on:

- local and state-controlled road networks, including key road and road/rail intersections during the construction and operation stages of the project
- capacity, safety, 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 (for example, road closures and diversions)

- the natural environment within the jurisdiction of an affected transport authority (for example, 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
- access to transport for people with a disability.

Mitigation strategies are to be outlined, for inclusion in a road-use management plan (RUMP), to be finalised in consultation with relevant transport authorities and providers, subsequent to the EIS, which will:

- consider the state and local agencies' works programs and forward planning that may affect the study area
- itemise the requirement for construction of new transport infrastructure and upgrading of existing infrastructure. Any required road works should be designed and constructed in accordance to the *Interim Guide to Road Planning and Design Practice* (Department of Transport and Main Roads 2010a) or local government standards as required
- indicate the timing, responsibilities and financial contribution for any required road works and additional transport infrastructure.

Traffic management issues for any required road works, and any approvals under the TIA may be finalised in a traffic management plan at pre-construction stage.

5.10.4. 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.

5.10.5. 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, including local government, and consider those authorities' works programs and forward planning.

Findings of studies and transport infrastructure impact assessments should be an input into preparing the RUMP.

Road/rail

Outline, for input to a RUMP to be finalised in consultation with relevant transport authorities and providers subsequent to the EIS:

- procedures for assessing and agreeing on the scope of required mitigation works with road/rail corridor managers, including any associated works, such as sourcing water and gravel
- 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 minimise road-based trips
- 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, for example, stockpile sites.

The findings of any road transport studies and RIA should be an input into preparing a RUMP.

Shipping

Consult the Regional Harbour Master regarding maritime issues relating to the movement and loading of ships, and any barge, tug and dredge operations.

Describe current and projected vessel use of the port and in the adjacent GBRMP and Commonwealth marine area, including their size, shipping movements, anchorages, access to and from the port, navigational arrangements and supporting shipping services.

Provide the cumulative impact of increased shipping in the GBRMP with other planned port expansions in Queensland.

Regarding increased shipping traffic due to the project, the following issues should be specifically assessed, in particular with reference to the GBRMP:

- 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 agency contingency planning
- sources and management of ship waste, in particular quarantine waste, domestic garbage, oil and sewage
- erosive effects of vessel wash associated with boat traffic generated by the proposal
- risk and management of groundings, spills, incidents and marine collisions
- potential for increased vessel strike to marine species
- potential impacts on existing shipping activity and navigable channels
- potential impacts on recreational and commercial fishing craft
- potential impact of the increased ship volumes through the GBRMP
- routes of ships in transit through port waters and the adjacent GBRMP, and the aligned infrastructure such as navigational aids
- potential impacts to TMR/Maritime Safety Queensland resources.

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

Air services

Describe the air services and their current capacity serving the region. Estimate the project's requirements for air transport to and from these regions (such as for workforce transportation), and the services required to supply these projections. Provide an assessment of the infrastructure needed to support the projected level of air services.

5.11. Indigenous cultural heritage

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.

Explain the significance of artefacts, items or places of Indigenous cultural heritage value likely to be affected by the project at a local, regional, state and national level.

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 DNRM 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

To the greatest extent practicable, significant Indigenous cultural heritage areas should be avoided by the project.

Provide an assessment of any likely impacts of the project on sites of Indigenous cultural heritage value.

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.

Describe the means of mitigating any negative impact on cultural heritage values and enhancing any positive impacts.

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

Native title agreement or cultural heritage management plan

During the EIS process, the proponent should initiate either a native title agreement (NT agreement), as defined under the *Aboriginal Cultural Heritage Act 2003* (Qld) (ACH Act), which includes management and protection strategies for Indigenous

cultural heritage, should the project require the extinguishment of native title, 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 operation stages 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.

Describe 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.

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 (for example, local historical societies) concerning:
  - places of non-Indigenous cultural heritage significance
  - opinion regarding significance of any cultural heritage places 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

Assess any likely effects of the project on sites of non-Indigenous cultural heritage value.

Provide strategies to mitigate and manage any negative impacts on non-Indigenous cultural heritage values and enhancing any positive impacts.

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

6. Social values and management of impacts

6.1. Description of existing social values

Conduct a social impact assessment (SIA) in consultation with the Significant Projects Coordination Branch (SPC) in the office of the Coordinator-General, MRC and other relevant authorities and stakeholders. Matters to be considered in the SIA include the social and cultural area, community engagement, a social baseline study, a workforce

profile, potential impacts mitigation measures and management strategies, and a social impact management plan (SIMP).

Cross reference this section with Part B, Section 7.1 (Economy) of this TOR.

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 (for example, integrity of social conditions, visual amenity, liveability, social harmony and wellbeing, and sense of community)
- Indigenous social and cultural characteristics, such as native title rights and interests, and cultural heritage.

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 undertake a community engagement strategy to engage at the earliest practicable stage with likely affected parties to discuss and explain the project and to identify and respond to issues and concerns regarding social impacts.

Detail the community engagement strategy used to conduct open and transparent dialogue with stakeholders (see also Part B, Section 3.7 of this TOR). This strategy should include the project's planning and design stages and future operations including affected local and state authorities. Engagement processes should consider social and cultural factors, customs and values, and, where relevant, linkages between environmental, economic, and social impact issues.

Discuss how complaint resolution will be addressed, for all stages of the project.

6.1.3. Social baseline study

Undertake a targeted baseline study of the people residing in the project's social and cultural area 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.

The social baseline study should describe and analyse a range of demographic and social statistics determined, in consultation with SPC, the Office of Economic and

Statistical Research, MRC and other relevant authorities and stakeholders, relevant to the project's social and cultural area including:

- total population (the total enumerated population for the social and cultural area and the full-time equivalent transient population), 18 years and older
- demographic characteristics (including the Indigenous population), including age and gender
- major population trends/changes that may be occurring irrespective of the project
- estimates of population growth and population forecasts resulting from the proposal
- family structures
- age and gender distributions
- education, including schooling levels
- health and wellbeing measures
- the Indigenous population including age and gender
- cultural and ethnic characteristics
- income including personal and household
- labour force by occupation and industry
- housing availability and affordability, including:
  - the rental market (size, vacancy rate, seasonal variations, weekly rent by percentage dwellings in each category)
  - availability and typical costs of housing for purchase, monthly housing repayments by percentage dwellings in each category
  - availability of social housing
  - housing costs (monthly housing repayments (per cent of dwellings in each category), and weekly rent (per cent dwellings in each category), housing tenure type, landlord type, household and family type
- disability prevalence
- the social and economic index for areas, index of disadvantage—score and relative ranking
- crime, including domestic violence
- any other indicators determined as relevant through the community engagement process.

The social baseline study should also take account of current social issues such as:

- current social infrastructure including community and civic facilities, services and networks (for definition see *South East Queensland Regional Plan 2005–2026: Implementation Guideline No.5: Social infrastructure planning* (Department of Infrastructure 2007) and *Mackay, Isaac and Whitsunday (MIW) Regional Plan 2011–2031* (Department of Local Government and Planning 2012))
- 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:
  - rural properties, farms, croplands and grazing areas, including on-farm activities near the proposed activities
  - 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 forestry, fishing, recreation, business and industry, tourism, aquaculture, and Indigenous cultural use of flora and fauna.

6.1.4. Workforce profile

The SIA must include a profile of the workforce that describes the:

- workforce demand:
  - the estimated composition of workforce by occupation, project stage and duration (including any planned construction prior to final investment decision) using the template provided at **www.skills.qld.gov.au**
- supply issues and strategies:
  - analysis of relevant local, state and national workforce profiles and labour supply
  - strategies and proposed programs for:
    - recruitment and attraction
    - population groups (including Indigenous, women, secondary school students and unemployed and underemployed)
    - unskilled and semi-skilled labour requirements
    - structured training (apprenticeships, traineeships, graduates)
    - analysis of impact on local community workforce.

The fact sheet on Skills Queensland's website (**www.skills.qld.gov.au**) provides essential information, contact and relevant program details to develop the workforce management plan.

6.2. Potential impacts

Assess and describe the type, level and significance of the project's social impacts, both beneficial and adverse, for the both the construction and operation stages, 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
- 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

- if the project is likely to result in a significant increase in the population of the area, then the proponent should consult the relevant local and state authorities and summarise the results of the consultations
- 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 and disadvantaged groups including women, single parents, children and young people, the aged, people from non-English speaking backgrounds 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. Explain how these workforce strategies relate and align to state and Commonwealth resource workforce planning, skill development and training strategies and policies
  - proposed new skills and training related to the project including the occupational skill groups required and potential skill shortages anticipated for the State of Queensland
  - outline proposed skills and training to be delivered to employees sourced within Queensland with special attention to offering generic skills training to workers in occupations with Skill levels 4 and 5 beyond construction and operation stages of the project
  - how much service revenue and work from the project would be likely to flow to the project's social and cultural area
  - impacts of construction and operation workforces, their families, and associated contractors on housing and accommodation availability and affordability, property market, land use and land availability. Discuss the capability of the existing housing and rental accommodation market to meet any additional demands created by the project. Consider the impacts to the local housing market of the workforce required for the construction of any temporary accommodation camps
  - impacts on government, community, educational and health services
  - impact of project construction and operation, including additional marine transport, on recreational, commercial and Indigenous boating and fishing.

6.2.1. Cumulative social impacts

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 the office of the Coordinator-General, if they overlap the proposed project.

6.2.2. 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 operation 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—the Major Resource Projects Housing Policy (Department of Employment, Economic Development and Innovation 2011b) sets out the core principles to guide the identification and assessment of accommodation and housing impacts and development of mitigation and management strategies (see also Part B, Section 4.5.4 of this TOR)
- 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
- preparation and implementation of an Indigenous participation plan, in consultation with SPC and other relevant authorities and stakeholders
- adequate provision of education, training and employment for vulnerable and disadvantages groups and Indigenous peoples.

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

6.2.3. Social impact management plan

Present a draft SIMP that promotes an active and ongoing role for impacted communities and local authorities through the project life cycle. The draft SIMP should cover:

- assignment of accountability and resources
- updates on activities and commitments
- mechanisms to respond to public enquiries and complaints
- mechanisms to resolve disputes with stakeholders
- periodic evaluation of the effectiveness of community engagement processes
- practical mechanisms to monitor and adjust mitigation strategies and action plans
- action plans to implement mitigation strategies and measures.

For further information on preparing the SIMP, refer to *Social impact assessment: Guideline to preparing a social impact management plan* (Department of Infrastructure and Planning 2010).

7. Economic values and management of impacts

7.1. Economy

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 and unemployment statistics
- economic indicators
- estimate the Gini coefficient based on current income distribution for the resident population in the region and estimate the likely impact of the project on the Gini coefficient for the region
- the regional economy's key industries and their contribution to regional economic income
- the key regional markets relevant to the project:
  - labour market
  - housing, land and rental accommodation markets
  - construction services and building inputs market
  - educational 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 (for example, wage rates, building costs, housing rent)
- land values in the region by type of use.

Cross reference this section with Part B, Section 6.1 of this TOR.

7.1.2. Potential impacts and mitigation measures

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

The assessment should use a regional general equilibrium model analysis tool or similar model to measure impacts and state the assumptions underlying the economic analysis.

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

- employment
- property values
- industry output (for example, large construction projects)
- impact of project construction and operation, including additional marine transport, on commercial boating and fishing
- both positive and negative impacts on the tourism industry due to any effects on the Great Barrier Reef
- potential impact on regional availability of extractive resources
- 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
- the likely material fiscal impacts on national, state and local governments arising from the economic and social impacts of the project.

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 stages 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) (Skills Queensland 2008)
  - to use of 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) as a guide for creating Indigenous employment opportunities
  - development of a Local Industry Participation Plan in accordance with the requirements of the Local Industry Policy (Department of Employment, Economic Development and Innovation 2010) and *Local Industry Policy Guidelines* (Department of Employment, Economic Development and Innovation 2011a), in conjunction with the DSDIP Office of Advanced Manufacturing to embrace the use of locally sourced goods and services.

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 construction and operation of the project, which may include but are not restricted to:

- potential hazards, accidents, spillages and abnormal events that may occur during all stages of the project, including possible frequency of occurrence
- all hazardous substances to be used, stored, processed or produced and the rate of usage
- potential wildlife hazards, natural events, seasonal conditions, extremes of climate and natural or induced hazards, and implications related to climate change.

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, operation and decommissioning stages 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 levels of risks from the above analysis.

Provide details on the risk management measures 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 areas.

The risk assessment 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 result on 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 DSDIP 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.

Provide draft risk management plans for the construction and operation stages of the project.

8.2. Health and safety

8.2.1. 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.

8.2.2. Potential impact and mitigation measures

Define and describe the objectives and practical measures for protecting or enhancing health and safety 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 the health and safety of the community and workforce from project construction and operation. Recommend any practical monitoring regimes in this section.

Include relevant consultation with the appropriate regional health service providers.

8.3. Emergency management plan

Present preliminary information on the design and operation of proposed safety and contingency systems and response strategies to address significant emergency issues for all components and stages of the project delineated in the risk assessment, together with at least the following areas of incident and emergency:

- security breach
- marine incidents
- fire
- emergency medical response and first aid matters
- release of contaminants and hazardous substance
- extreme weather events
- emergency shutdown systems and emergency procedures.

Identify potential maritime impacts and mitigation strategies in accordance with the *Maritime Safety Queensland Guidelines for Major Development Proposals* (Department of Transport and Main Roads 2010b).

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 and response measures for any site buildings and temporary workforce 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 emergency planning and response strategies to deal with relevant incidents as mentioned above, which have been determined in consultation with the relevant authorities (such as the Queensland Police Service, Queensland Ambulance Service, Queensland Fire and Rescue Service and Emergency Management Queensland), and which show integration of emergency services into the plans.

9. Cumulative impacts

Summarise the project's cumulative impacts and describe how these impacts could contribute to or are in addition to those of existing or proposed major project(s) publicly known or advised by DSDIP to be in the region, to the greatest extent practicable.

Assess the project's contribution to cumulative impacts with respect to both geographic location and environmental values.

Regarding local impacts and the contribution to regional cumulative impacts, matters of particular consideration include:

- transport network, including impacts to the local and state-controlled roads, major road intersections and road/rail crossings, port and air services (see also Part B, Section 5.6)
- rail network impacts including noise, vibration and dust during construction and operation (see also Part B, Section 5.10)
- housing availability and affordability (see also Part B, Section 6)
- workforce and skills availability, including workforce recruitment and training opportunities and local industry participation (see also Part B, Section 6).

Explain the methodology used to determine the project's contribution to cumulative impacts, 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. 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* (Commonwealth of Australia 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.

11. Environmental management plans

Detail the EMPs for the construction and operation stages of the project. The EMPs should be developed from, and be consistent with, the information in the EIS. The EMPs must address discrete project elements and provide life-of-proposal control strategies. They must be capable of being read as a stand-alone documents without reference to other parts of the EIS.

The EMPs 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 EMPs is:

Element	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 EMPs, may be included as Coordinator-General's conditions to ensure the commitments are met. Therefore, the EMPs are relevant documents for project approvals, environmental authorities and permits, and may be referenced by them.

In addition to the EMPs, provide a draft DMP, as required for development approval under the Coastal Act, with reference to the Queensland Coastal Plan, Annex 9, 'Preparing a management plan for dredging activities' (Department of Environment and Resource Management 2012a).

12. Conclusions and recommendations

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

13. References

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

14. Appendices

Provide the following as appendices to the EIS:

- final TOR for the EIS

- TOR cross-reference table, which links the requirements of each section/subsection of the TOR with the corresponding section/subsection of the EIS, where those requirements have been addressed
- a list of the project approvals required by the project
- the consultation report, as described in Part B.,Section 3.7
- a list of the relevant qualifications and experience of the key study team members and specialist sub-consultants
- a glossary of technical terms
- a list of abbreviations
- all reports generated on specialist studies undertaken as part of the EIS, including but not limited to:
  - flora, fauna and biodiversity (including coastal and marine ecology)
  - air quality
  - noise and vibration
  - marine water quality and hydrodynamics
  - surface and groundwater hydrology
  - flooding
  - geology, soils and geomorphology (including coastal and marine)
  - economic studies and/or cost-benefit analyses
  - transport studies (including road impacts)
  - cultural heritage
  - hazard and risk studies
  - land use and land capability studies
  - social and economic impact assessment
  - contribution to cumulative impacts.
- a copy of the proponent's corporate environmental policy and planning framework document
- a list of all commitments made by the proponent in the EIS, with cross-references to the relevant section in the EIS.

Abbreviations

Acronym/ abbreviation	Definition
ACH Act	*Aboriginal Cultural Heritage Act 2003* (Qld)
Adani	Adani Mining Pty Ltd (the proponent)
AS/NZS	Australian standard/New Zealand standard
ASS	acid sulfate soils
ASSMP	acid sulfate soils management plan
CAMBA	China–Australia Migratory Bird Agreement
CHMP	cultural heritage management plan
Coastal Act	*Coastal Protection and Management Act 1995* (Qld)
DAFF	Department of Agriculture, Fisheries and Forestry, Queensland
DMP	dredge management plan
DNPRSR	Department of National Parks, Recreation, Sport and Racing, Queensland
DNRM	Department of Natural Resources and Mines, Queensland
DPCT	Dudgeon Point Coal Terminals Project (the project)
DPPM	Dudgeon Point Project Management Pty Ltd (the proponent)
SEWPaC	Australian Government Department of Sustainability, Environment, Water, Population and Communities
DSDIP	Department of State Development, Infrastructure and Planning, Queensland
EIS	environmental impact statement
EMPs	environmental management plans—for construction and operation stages
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
GARID	Guidelines for Assessment of Road Impacts of Development (Department of Main Roads 2006)
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
GBRMP Act	*Great Barrier Reef Marine Park Act 1974* (Cwlth)
GBRWHA	Great Barrier Reef World Heritage Area
JAMBA	Japan-Australian Migratory Bird Agreement
LIP	Queensland Local Industry Policy
MCU	material change of use
MHWST	mean high water spring tide
MNES	matters of national environmental significance (under the EPBC Act)
MRC	Mackay Regional Council
MSQ	Maritime Safety Queensland (of TMR)
NAGD	*National Assessment Guidelines for Dredging* (Commonwealth of Australia 2009)

NC Act	*Nature Conservation Act 1992* (Qld)
NGA	National Greenhouse Accounts
NT agreement	native title agreement
NQBP	North Queensland Bulk Ports Corporation Ltd (the lead proponent)
PASS	potential acid sulfate soils
QASSIT	Queensland Acid Sulfate Soils Investigation Team
REDD	Regional Ecosystem Description Database
RIA	road impact assessment
REMP	receiving environment monitoring program
ROKAMBA	Republic of Korea–Australia Migratory Bird Agreement
SAP	sediment sampling and analysis plan
SCL	strategic cropping land
SDPWO Act	*State Development and Public Works Organisation Act 1971* (Qld)
SIA	social impact assessment
SIMP	social impact management plan
SPC	Significant Projects Coordination Branch (of DSDIP)
SPA	*Sustainable Planning Act 2009* (Qld)
SPL	strategic port land
The proponent/s	• North Queensland Bulk Ports Corporation Ltd (NQBP) (the lead proponent) • Adani Mining Pty Ltd (Adani) • Dudgeon Point Project Management Pty Ltd (DPPM)
TIA	*Transport Infrastructure Act 1994*
TMR	Department of Transport and Main Roads, Queensland
TOR	terms of reference
VM Act	*Vegetation Management Act 1999* (Qld)

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