The Coordinator-General

Coordinator-General's report for an environmental impact statement

Townsville Marine Precinct project

March 2010

Under part 4 of the *State Development and Public Works Organisation Act 1971*

Toward Q2 Tomorrow's Queensland

Queensland Government

Townsville Marine Precinct project

Contents

List of Figures

Synopsis

Introduction

This Coordinator-General's report provides an evaluation of the potential environmental impacts of the Townsville Marine Precinct (TMP) project (the project). It has been prepared pursuant to section 35 of *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act).

The proponent for the project, the Port of Townsville Limited (POTL) proposes to undertake a project comprising the reclamation and development of approximately 34 hectares of intertidal strategic port land (SPL) near the mouth of the Ross River for the development of industrial marine facilities. The marine precinct is expected to include facilities that will support vessel fabrication and maintenance activities, berths for commercial and recreational vessels, retail supplies, seafood industry cold storage and distribution facilities, training facilities and other related activities.

The project will support the growth of the Townsville region, facilitate continued delivery of industrial marine services in the Townsville region and provide opportunity for the co-location and expansion potential of existing industries.

In undertaking my evaluation of the potential environmental, social and economic impacts of the project, **I have considered** the environmental impact statement (EIS), issues raised in submissions relating to the EIS, the supplementary information report (SIR) and advice received on a range of key issues from state government agencies, Townsville City Council (TCC) and the Commonwealth Government Department of Environment, Water, Heritage and the Arts (DEWHA).

I am satisfied that the requirements of the SDPWO Act have been satisfactorily fulfilled and that sufficient information has been provided to enable me to finalise the required evaluation of the potential impacts attributable to the project.

Impact on the coastal environment

Development of the project site involves the reclamation of 34 hectares of seabed in a coastal area adjacent to the Ross River which provides habitat for marine fauna and migratory birds. The EIS analysed the impact of the project on this location by considering its impact on tidal flows, water levels, flooding, coastal sedimentation, marine water quality, marine flora and fauna and shore birds.

The proposed reclamation area is largely outside the existing primary tidal flow and modelling shows that the project will have little impact on tidal flows and water levels. **I am satisfied** that the project will not affect flood vulnerability of residential areas in the Ross River floodplain however it is clear that the project needs to be designed to accommodate future storm tide hazards to ensure risks to people and property are adequately addressed.

The EIS considered the impacts of a protective breakwater located offshore from the proposed marine precinct. Although this structure is not likely to be included in stage one of the development, it may be incorporated into a later stage although in a modified configuration. The hydrodynamic modelling and sediment transport assessments for the EIS indicate that the breakwater would have moderate impacts on the local conditions. Accordingly, **I have imposed** conditions (Appendix 1, Schedule C, Conditions 1-3) to ensure its detailed design considers a range of performance criteria.

The EIS demonstrates that the existing marine water quality at the project site and the adjoining waters of Cleveland Bay regularly exceeds guideline values. Numerical modelling was employed to examine potential impacts on water quality from dredging and construction works. Investigation of sediment quality showed no concerns for potential release of contaminants in sediments disturbed by dredging.

POTL has committed to the management of potential impacts of the project through the implementation of an environmental management plan (EMP) and **I am confident** that POTL would manage the project using the successful practices applied in similar dredging and reclamation works previously undertaken in developing and operating the port.

The EIS indicates that the project is not expected to have a significant impact on the key marine mammals and reptiles in terms of disturbance to habitat, construction noise, or the disruption of routes between preferred habitats.

The draft EMP includes a number of measures to minimise the potential impacts on marine fauna and POTL has committed to continued monitoring and additional assessment as part of a marine megafauna management plan.

In addition to this, the EIS advises that the increased visitor access and use will not impact on the shorebird roosting and feeding habitat. **I conclude** that the project does not pose a significant risk to marine fauna in the project area or the surrounding Cleveland Bay and **I am satisfied** that the project site is not an important or critical habitat for the migratory bird species which frequent the eastern side of the Ross River.

Social and economic impacts

A large number of submissions were received to the EIS relating to the lack of recreational boating infrastructure in the Townsville region. Although outside the scope of the project, the proposed development of a new marine precinct was seen to offer an opportunity to provide new facilities. **I agree** with POTL's view that recreational boat ramps and carparks would not be an appropriate use of the marine precinct and **I note** the government's commitment to provide 14 new boat ramp lanes in Ross River. These will be pursued separately by the Department of Transport and Main Roads (DTMR) and TCC.

Several public submissions were concerned that the project would result in the loss of access to the beach and mudflats at Benwell Road, which has been used by the public for activities such as walking dogs, walking or jogging and fishing. **I recognise** the loss of this area to the development however **I note** that the project site has been designated for development for many years.

The EIS finds that the visual impacts to the landscape resulting from the project are of moderate significance however **I am satisfied** that the visual character of the proposed development is consistent with the existing marine industry of the Townsville Port and that the marine precinct is far enough away from residential areas to prevent a loss of visual amenity for these individuals.

A significant economic issue raised by the EIS process is the impact of the proposed Townsville Port Access Road bridge on navigation access for the existing marine industry in Ross River. The marine precinct provides the opportunity for these businesses to relocate to a purpose built facility. **I am confident** that POTL has consulted and provided opportunity for individual marine industry businesses in this area to include specific requirements in the design of stage one of the project.

Impact on infrastructure and services

The EIS examined the potential impact of the project on infrastructure and services including roads, water supply, wastewater, stormwater and other services.

The traffic impact assessment (TIA) concluded that the traffic generated by the construction and operation of the project would not have a significant impact on the functionality of the existing road network and associated infrastructure. **I am satisfied** with this conclusion for stage one of the project however this assessment will need to be reviewed for later development stages.

Based on advice from DTMR, **I have imposed** conditions (Appendix 1, Schedule C, Conditions 10-12) to ensure impacts on the state controlled road network are appropriately managed and that other concerns are addressed relating to the rail crossing, stormwater flows, public transport and on-site parking.

Stormwater runoff will be managed through the EMP in accordance with best practice water sensitive urban design to ensure adverse impacts to receiving waters are avoided and minimised. Stormwater discharges must be designed to avoid local flooding impacts.

In relation to the water and wastewater requirements of the project, **I am confident** that the proponent will work with TCC to provide adequate services.

Environmental management of the site

The EIS has undertaken a range of assessments to evaluate the potential impacts of the project on air quality, noise and vibration levels and lighting on nearby sensitive receivers. The nearest residential areas are located more than 350 metres away from the project site.

The evaluation concludes that, provided appropriate management procedures included in the EMP are implemented, construction and operation of the marine precinct would not significantly impact on the amenity of sensitive receivers. The EIS recommended a number of mitigation measures and **I have imposed** conditions (Appendix 1, Schedule C, Conditions 6-7) to ensure these are carried forward.

Conclusion

I consider that the proposed marine precinct would enable the consolidation and orderly future development of maritime industries and services in the Port of Townsville and, importantly, would provide facilities for those marine industries relocating from Ross River. Overall, there is a significant economic and environmental benefit for the Townsville and North Queensland regions to be derived from the project.

Therefore, **I recommend** that the Townsville Marine Precinct project, as described in detail in the EIS and SIR, and summarised in section 2 of this report, can proceed, subject to the conditions contained in Appendix 1 of this report.

Colin Jensen
Coordinator-General

Date: Signed 17 March 2010

1. Introduction

This report provides an evaluation of the environmental impact statement (EIS) process for the Townsville Marine Precinct (TMP) proposed by the Port of Townsville Limited (POTL).

It has been prepared pursuant to section 35 of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act).

An initial advice statement (IAS) was lodged with the Coordinator-General in July 2008 (IAS, dated 1 July 2008) and the project was declared to be a 'significant project for which an EIS is required' under section 26(1)(a) of the SDPWO Act, on 22 August 2008.

On 3 November 2008, the project was determined to be a 'controlled action' pursuant to section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act)—reference number EPBC 2008/4497. Under a bilateral agreement with the Commonwealth Government, the Coordinator-General's report will be used by the Commonwealth Minister for the Environment, Heritage and the Arts to make an assessment of the controlled action for the purposes of the EPBC Act.

The objective of this report is to evaluate the key issues associated with the potential impacts of the project on the physical, social and economic environments at the local, regional, state and national levels. It is not intended to record all the matters that were identified and subsequently settled. Instead, it concentrates on the substantive issues identified during the EIS process.

In evaluating the environmental effects of the project, I have considered the EIS, issues raised in submissions to the EIS, the supplementary information report, advice provided by state agencies and Townsville City Council on a range of key issues and other relevant information.

2. Project description

2.1 The proponent

The proponent for the Townsville Marine Precinct (TMP) project is the Port of Townsville Limited (POTL).

POTL is a government owned corporation incorporated under the *Corporations Act 2001* (Cwth) and pursuant to the *Government Owned Corporations Act 1993*. POTL is a port authority under the *Transport Infrastructure Act 1994* and is responsible for managing the Port of Townsville.

2.2 The project

The project proposal comprises the reclamation and development of approximately 34 hectares of inter tidal strategic port land (SPL) land near the mouth of the Ross River to the south-east of the existing port operational facilities for industrial marine infrastructure and facilities (see Figure 1 Project locality and Figure 2 Project site).

Industrial marine facilities to be included in the precinct comprise:

- a commercial slipway, barge ramp, ship-lift, docking facility and associated maritime facilities and infrastructure to support vessel fabrication and maintenance
- berths for 50 trawlers, scientific and tourist vessels, vehicular barge, provisioning, sewage pump out and refuelling for commercial and recreational users
- commercial and recreational chandlery
- seafood industry cold storage and distribution facilities
- marine industry training facilities and small scale eateries to support industry in the precinct.

The project proposal will also require capital dredging to create an inner harbour and a swing basin, and ongoing maintenance dredging and may also incorporate the construction of a breakwater on the eastern side of the mouth of Ross River to protect the marine precinct from sediment infill and wave action.

The future remediation and redevelopment of upstream land vacated by businesses relocating to the TMP is not included in the scope of the project and is not considered in this evaluation report.

The project is located adjacent to the Townsville City Council (TCC) local government area.

The EIS estimates that construction of the project would inject $109 million into the Queensland economy and generate approximately 400 full-time equivalent (FTE) positions during construction, while protecting a further 500 FTE positions employed in the existing upstream industries, which would otherwise be affected if the TMP does not proceed.

2.3 Project rationale

The continued growth experienced in the Townsville region has resulted in encroachment of residential development on Townsville's waterways and limited the ability for existing industrial facilities occupying facilities in Ross River and Ross Creek to expand.

To facilitate continued delivery of industrial marine services in the Townsville region and provide opportunity for expansion potential of existing industries there is a current need to provide a dedicated marine industrial facility to co-locate and consolidate marine dependent industries.

In addition, the development of the Department of Transport and Main Roads' (DTMR) Townsville Port Access Road (TPAR), which includes a low-level fixed bridge, with a navigable clearance of six metres at highest astronomical tide (HAT), across the Ross River will restrict boating access to a number of upstream marine industries in Ross River from mid-2011 when the closing bridge span is in place.

There is a need to either upgrade or relocate the older facilities, many of which are now situated in inner city and residential areas as the city has grown, and provide capacity for new marine related activities. A new purpose built facility would provide an opportunity to co-locate similar marine dependent industries and would enable the provision of best practice environmental management infrastructure.

Figure 1: Project locality

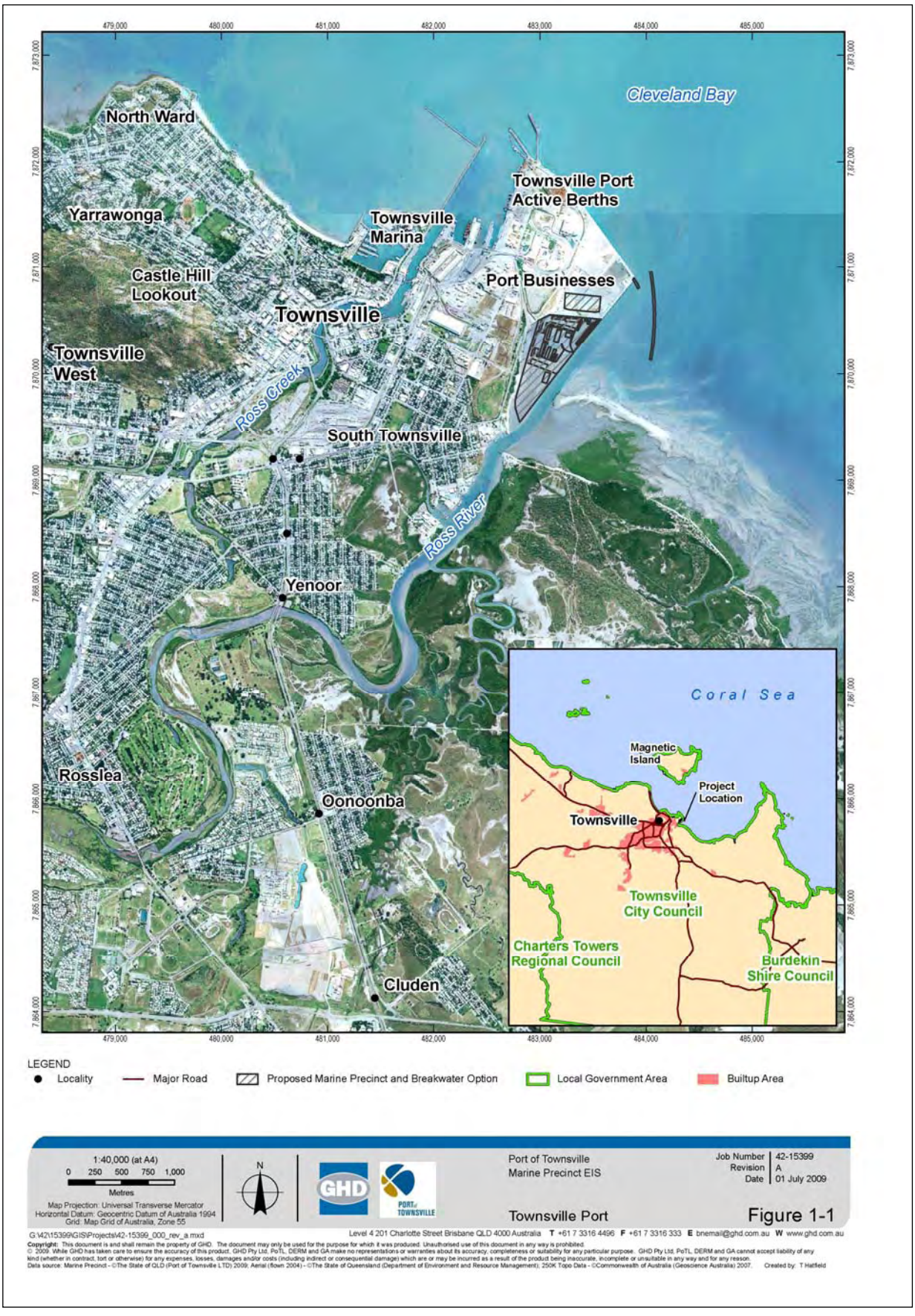
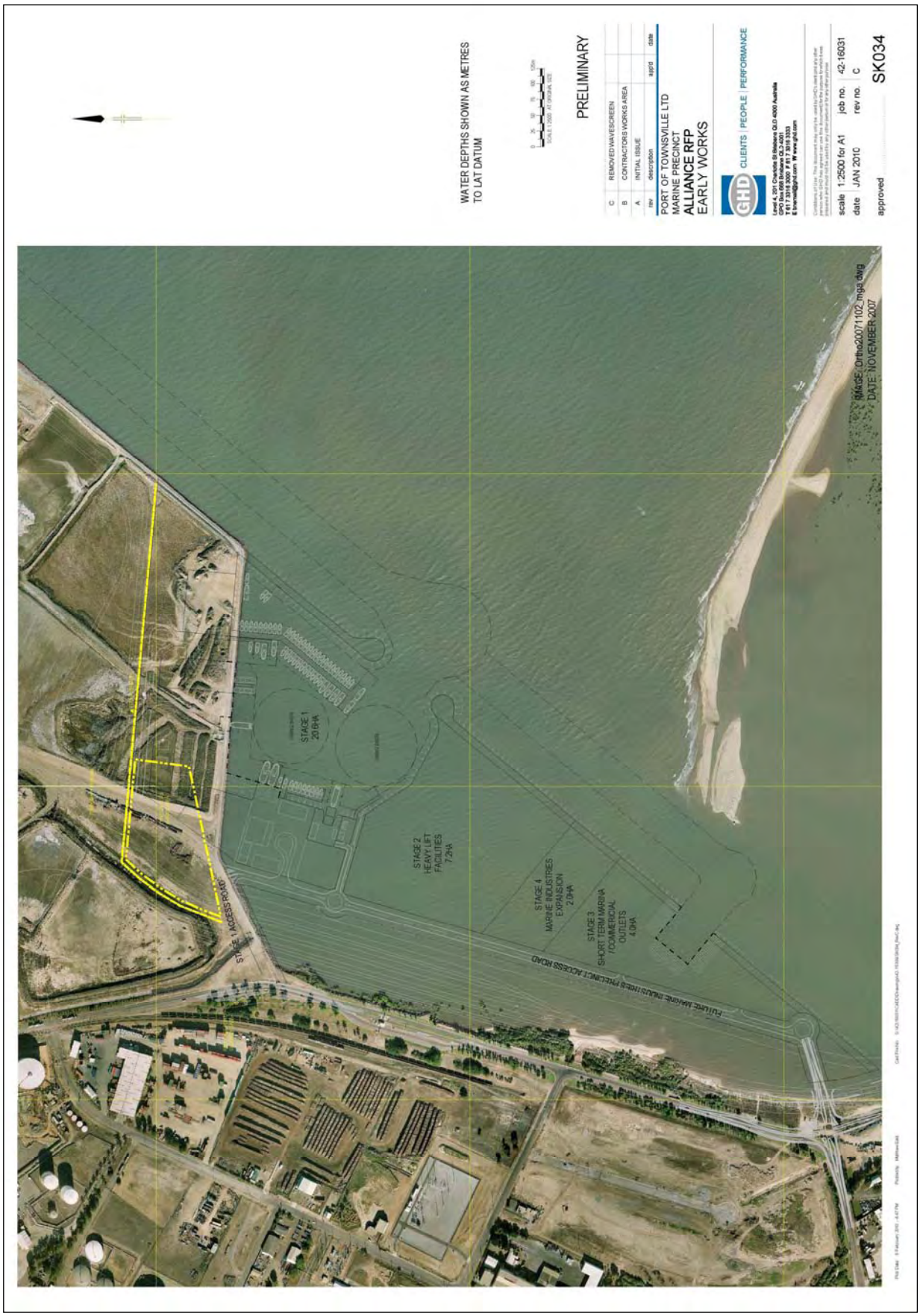


Figure 2: Project site



3. The environmental impact assessment process

3.1 Commonwealth impact assessment

On 7 October 2008, the proponent referred the project to the Commonwealth Minister for the Environment, Heritage and the Arts (referral number 2008/4497) for a determination as to whether the project would constitute a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act). The EPBC Act establishes a Commonwealth Government process for environmental assessment and approval of proposed actions that are likely to have a significant impact on 'matters of national environmental significance' or on Commonwealth Government land.

On 3 November 2008, the Commonwealth Minister for the Environment, Heritage and the Arts determined that the project is a 'controlled action' under section 75 of the EPBC Act. The controlling provisions of part 3, division 1 of the EPBC Act for the proposed action are:

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

In accordance with the Commonwealth Minister's decision on the assessment approach, the project requires assessment and approval under the EPBC Act. The Commonwealth Government has accredited the Queensland state EIS process, conducted under the SDPWO Act, under a bilateral agreement between the Australian and Queensland Governments. Under the bilateral agreement between the Commonwealth Government and the State of Queensland made under section 45 of the EPBC Act, if a controlled action is a significant project for which an EIS is required under the *State Development and Public Works Organisation Act 1971* (SDPWO Act), then the project does not require assessment under part 8 of the EPBC Act.

Under part 4 of the SDPWO Act and the *State Development and Public Works Organisation Regulation 1999* (SDPWO Regulation), the Coordinator-General, in preparing his assessment report, must ensure the report assesses all relevant impacts that the action has, will have or is likely to have and provide enough information about the action and its relevant impacts to allow the Commonwealth Minister to make an informed decision whether or not to approve the action under the EPBC Act.

This will enable the EIS to meet the impact assessment requirements under both Commonwealth and Queensland legislation. The project will require approval from the responsible Commonwealth Minister under part 9 of the EPBC Act before it can proceed.

3.2 State impact assessment

Section 35(3) of the SDPWO Act requires the Coordinator-General to prepare a report evaluating the EIS for a significant project for which an EIS is required. Under section 35(1) of the SDPWO Act, after the end of the EIS submission period, the Coordinator-General must consider the EIS, all properly made and other submissions accepted by the Coordinator-General about the EIS, and any other material the Coordinator-General considers is relevant to the project.

This Coordinator-General's report may state conditions under section 39, 45, 47C, 49 or 49B of the SDPWO Act, may make recommendations under section 43 or 52 of the Act and impose conditions under part 4, division 8 of the Act, for the undertaking of the project.

On completion of the Coordinator-General's report, a copy is provided to the proponent and publicly notified on the Department of Infrastructure and Planning website. The notification of this report and its provision to the Commonwealth Minister completes the assessment process under the SDPWO Act.

3.3 Declaration as a significant project

The TMP project was declared by the Coordinator-General a 'significant project for which an EIS is required' pursuant to section 26(1)(a) of the SDPWO Act on 22 August 2008.

Matters considered by the Coordinator-General in making this declaration included: information contained in an initial advice statement prepared by the proponent; relevant planning schemes and policy frameworks; infrastructure impacts; employment opportunities; environmental effects; complexity of local, state and Commonwealth Government requirements; level of investment; and the project's strategic significance.

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

3.4 Terms of reference for the EIS

The TOR assists the proponent to develop a comprehensive EIS for the project satisfying the requirements of the SDPWO Act.

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

In finalising the TOR, the Coordinator-General considered all properly made submissions and other submissions and information. The TOR were finalised and approved by the Coordinator-General for presentation to the proponent on 14 April 2009.

3.5 Public notification and review of the EIS

The EIS was approved for release and advertised publicly on Saturday 12 September 2009, inviting submissions until close of business on Monday 19 October 2009. A CD-ROM copy of the EIS was available free of charge from the proponent, and hard copies were available for purchase.

The EIS was displayed at:

- Townsville City Council Library
- State Library of Queensland, Brisbane.

Information on the project was available via the POTL website at www.townsville-port.com.au/content/view/383/1, the DIP significant projects website www.dip.qld.gov.au/projects.html, and general consultation was undertaken using methods such as advisory agency briefings in Townsville on Wednesday 16 September 2009 and in Brisbane on Thursday 17 September 2009.

The following advisory agencies were requested formally to conduct an evaluation of the EIS:

- Department of Environment and Resource Management
- Department of Employment, Economic Development and Innovation
- Department of Transport and Main Roads
- Maritime Safety Queensland
- Department of Infrastructure and Planning
- Department of Communities

- Department of Community Safety
- Queensland Health
- Queensland Police Service
- Queensland Treasury
- Department of the Premier and Cabinet
- Townsville City Council
- Great Barrier Reef Marine Park Authority
- Commonwealth Department of Defence
- Commonwealth Government Department of Environment, Water, Heritage and the Arts.

3.6 Submissions received on the EIS

Following the five week public review of the EIS, 328 submissions were received with the following distribution.

Advisory agencies	• Queensland Health • Department of Transport and Main Roads • Department of Infrastructure and Planning • Department of Employment, Economic Development and Innovation • Department of Environment & Resource Management • Townsville City Council • Hinchinbrook Shire Council • Commonwealth Government Department of Environment, Water, Heritage and the Arts
Private Organisations	• Townsville Water • Pacific Rim Technical Services • Townsville Skindiving Club • Tackle World • Cungulla Recreational Fishing & Social Club • Townsville Region Bird Observers Club • Commercial & Industrial Executive Townsville Colliers International • Tropical Waste Services • Pacific Marine Group Pty Ltd • Townsville Local Marine Advisory Committee • Wood Boat Association of North Queensland • AECOM • Townsville Correctional Centre • Blue Water Project Management P/L • Fishermans Landing Fishing and Social Club • Everingham Lawyers • Minpro Mining and Engineering • Townsville Ross River Marina P/L • Sunfish North Queensland • Queensland Seafood Industry Association • WWF – Australia • RAAF • Jackin Around Pty Ltd
Private Individuals	• Numerous

3.7 Supplementary information to the EIS

Following the receipt and analysis of submissions, it was determined by DIP officers that a supplementary EIS would not be required and that unresolved issues could be directly negotiated by an exchange of information between POTL, advisory agencies and public submitters. POTL proceeded to correspond and liaise directly with advisory agencies and public submitters to resolve any outstanding issues.

On 11 January 2010, a supplementary information report (SIR, GHD report reference number 42/15399/00/399564, January 2010) to the EIS was provided to DIP that addresses the key issues of concern raised by public and agency submitters to the EIS.

4. Approvals, permits and licenses

4.1 State approvals

4.1.1 Overview of approvals regime

The *State Development and Public Works Organisation Act 1971* (SDPWO Act) establishes the framework for environmental assessment of declared significant projects in Queensland and is the controlling legislation for the project at the state level.

The planning and approvals framework applicable to the development of the project is the *Sustainable Planning Act 2009* (SPA). The SPA requires certain development to be assessed for their environmental effects and to be approved. Schedule 3 of the *Sustainable Planning Regulation 2009* (SPR) and the relevant local planning instrument determine the types of development requiring approval.

4.1.2 Strategic Port Land

The area of the proposed reclamation has been included within the POTL's strategic port land (SPL). Under Schedule 3 of the SPR, development on SPL that is consistent with a Strategic Port Land Use Plan approved under the *Transport Infrastructure Act 1994* is exempt from assessment against a local government planning scheme.

Development approvals on port lands are subject to the Integrated Development Assessment System (IDAS) defined by the SPA. All development assessable under IDAS that are wholly on SPL or within the strategic port land tidal areas will be assessed by the POTL as the assessment manager.

POTL assesses development applications against the approved Land Use Plan 1996. The proposed marine precinct is currently designated for 'Port-dependent industry' therefore individual businesses that are not inconsistent with that designation would not require approvals for material change of use.

POTL has developed a draft document supporting the Land Use Plan entitled *Planning Codes and Guidelines* and is used by POTL for development assessment within the SPL. The document is currently in draft form and will be finalised on completion of public consultation on the Port of Townsville 2010 Land Use Plan.

The key approvals necessary for development of the project required under the SPA include:

- a development permit for operational works for tidal works and work within a coastal management district (reclamation)
- a development approval and registration certificate for dredging operations that is an environmentally relevant activity (ERA 16, dredging)
- development approvals and registration certificates for various operational ERAs associated with industrial activities within the marine precinct.

An application for a development permit for operational works will also require referral for assessment against the *Fisheries Act 1994* (work that is for the removal, destruction or damage of marine plants and waterway barrier works) and the *Transport Operations (Marine Safety) Act 1994*.

Operational phase environmental management will be addressed as part of the POTL Environmental Management System (EMS). Operational requirements set out in the Environmental Management Plan (EMP) for the marine precinct project will be incorporated into the EMS subject to the final design.

All businesses that subsequently take up residency in the marine precinct must obtain all relevant development approvals, as applicable, and must have an environmental management plan that is integrated with the port's EMS.

Development approvals (including for ERAs) for individual businesses in the marine precinct will include consideration of a range of matters including air and noise emissions, lighting, stormwater and waste management.

4.1.3 Environmentally relevant activities

On 1 January 2009, the *Environmental Protection Regulation 2008* came into effect. The regulation included a revised set of environmentally relevant activities (ERAs) that could be associated with the construction and operation of infrastructure.

The *Environmental Protection Act 1994* (EP Act) requires that any person carrying out an ERA must hold, or be acting under a registration certificate for the activity. It is an offence to carry out an ERA unless the person is a registered operator for the activity, or is acting under a registration certificate for the activity. All operators within the marine precinct are also required to have a development permit approval for the activity, unless a code of environmental compliance applies to the activity.

DERM will be the concurrence agency for development approval for undertaking ERAs pursuant to the EP Act. Development approval required for ERAs is obtained through the Integrated Development Assessment System (IDAS) as defined by chapter 3 of the *Sustainable Planning Act 2009* (SPA).

The dredging operations required for construction of the project and maintenance of navigation channels is classified as ERA 16 'extractive and screening activities' consisting of dredging a total of 1000 tonnes or more of material from the bed of naturally occurring surface waters in a year. DERM has provided conditions for ERA 16 which are included at Appendix 1 Schedule B of this report.

Subsequent approvals for ERAs will be assessed by POTL as assessment manager and DERM as concurrence agency. As the exact details of the likely ERAs in the marine precinct are not currently known, approval conditions are not specified in this report. All development would be required to comply with the port's assessment codes specified in the draft *Planning Codes and Guidelines* document.

4.1.4 Quarry material allocation

The use of dredged material for the reclamation works requires the removal of bed material from tidal waters and therefore requires an allocation of quarry material in accordance with part 5 of the *Coastal Protection and Management Act 1995*. Section 75 of the Act sets out the assessment criteria for deciding an application. These criteria include:

- relevant policies of the state and regional coastal management plans
- impacts on the physical integrity of river bed and banks
- impacts on water quality and ecological values
- impacts associated with placement of the dredged material
- economic and social implications
- views of the local government and the Regional Harbour Master.

An application for a quarry material allocation would be made by the proponent prior to obtaining development permits for operational works.

4.1.5 Summary of state approvals

Part 4, division 7 of the SDPWO Act applies to my evaluation of the project. This EIS evaluation report may state conditions under section 39 or 47C of the SDPWO Act, may make recommendations under section 52 of the SDPWO Act and impose conditions under part 4, division 8 of the SDPWO Act, for the undertaking of the project.

Appendix 1 Schedule A contains the Coordinator-General's recommended conditions that apply to development permits issued under the SPA for the project and states the entity that is to have jurisdiction for the condition after the development approval has taken effect. The conditions are taken to be concurrence agency conditions under the SPA. The conditions recommended do not limit the assessment manager's power to assess the development application and impose conditions not inconsistent with the conditions in Appendix 1 Schedule A.

Appendix 1 Schedule B contains the recommended conditions that apply to a development approval for an environmentally relevant activity (ERA 16 dredging) for the project pursuant to the EP Act.

Appendix 1 Schedule C contains the Coordinator-General's imposed conditions that apply to the project. The conditions are taken to be approval conditions under the SPA and nominates the entity that is to have jurisdiction for the condition.

4.2 Commonwealth approvals

In addition to the state and local government approvals necessary for the development of the project, Commonwealth Government approval under section 133 of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) to take a controlled action is also required. Further discussion of the assessment against the EPBC Act is provided in section 6 of this report.

If ocean disposal of dredged material is required for maintenance dredging, a sea dumping permit will be required under the *Environment Protection (Sea Dumping) Act 1981*. This would be considered in conjunction with the existing permit held by POTL for its overall maintenance dredging program in the port.

5. Evaluation of environmental effects

5.1 Introduction

The SDPWO Act defines 'environment' to include:

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

b) all natural and physical resources

c) the qualities and characteristics of locations, places and areas, however large or small, which contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community

d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).

'Environmental effects' mean 'the effects of development on the environment, whether beneficial or detrimental'. These effects can be direct or indirect, of short, medium or long-term duration and cause local or regional impacts.

This section outlines the major environmental effects identified during the EIS process, including those raised in the EIS, SIR, in submissions on the EIS, and in consultation with advisory agencies and other key stakeholders.

Where appropriate, **I have provided comments** on these matters and, where necessary, **I have recommended or imposed** development approval conditions to mitigate adverse impacts of the project that have been identified in the EIS.

5.2 Coastal environment

5.2.1 Coastal hydrodynamics

5.2.1.1 Context

The proposed reclamation of 34 hectares of seabed has the potential to influence local hydrodynamic conditions particularly tidal and riverine flows near the mouth of Ross River. In addition, the proposed detached breakwater would also locally affect water movements and wave conditions.

The impacts of the project are considered in the context of its location adjacent to the existing reclaimed port land which extends approximately 1500 metres into Cleveland Bay and has a major effect on local hydrodynamics and sediment transport. The project site has been extensively modified and has in fact been artificially created by the previous port reclamation.

As noted above, the EIS has considered a reference design for the project. An updated design layout was provided in the supplementary information report—this shows little change to the footprint of the reclamation area however the detached breakwater configuration as originally proposed in the EIS (option C) will not be constructed in stage one of the project.

A number of breakwater options were considered in the EIS investigations. Objectives of the design process were to provide a cost effective wave protection for the precinct to enable the safe mooring of vessels, to allow safe navigation of vessels and to avoid adverse impacts on the sand spit at the mouth of Ross River.

A preliminary design objective was to provide for the berthing of vessels along the seaward face of the reclamation. Following consultation with industry users, POTL has determined this is now not a priority. The larger detached breakwater configuration tested in the EIS investigations may not be necessary and a shorter structure may be contemplated in future stages of the project.

5.2.1.2 Tidal flows and water levels

The EIS investigated the effects of the reference design on tidal flows within the project area. The modelling, which includes consideration of both tidal flows and wind-wave induced water movements, is described in Appendix I of the EIS document.

The modelling of existing conditions shows relatively strong tidal flows through the Ross River entrance channel (in the order of 0.4 metres per second peak flows for a spring tide). Model results for the reference design case show that current magnitudes would be generally reduced in the river entrance channel and adjacent to the proposed reclamation. Noticeably higher flow velocities are predicted in areas near the ends of the breakwater. These results clearly indicate the blocking effect of the detached breakwater on the prevailing tide flows and the acceleration of flows around the ends. This can be attributed to its size and its alignment diagonally across the flow path.

Model results indicate that, although flow velocities are affected, there would be negligible change to water levels in Ross River when comparing the existing and developed cases.

The hydrodynamic modelling shows that tidal flows within the project area are relatively uni-directional, following the alignment of the river mouth and the edge of existing port land. The proposed reclamation area is largely outside the existing primary tidal flow paths and the model results demonstrate that its influence on local tidal hydrodynamics would be negligible.

5.2.1.3 Riverine flooding

Although the Ross River is regulated via weirs and the Ross River Dam, some residential areas of Townsville are vulnerable to flooding during extreme events. Townsville City Council raised concerns about the effects of the project on river levels during flood events and potential to increase flood impacts within vulnerable areas.

The EIS reports on preliminary results of modelling undertaken by DTMR for the eastern port access road project (TPAR). During large floods the roadway would have the effect of interrupting overbank flood flows in the southern section of the lower floodplain. As reported in the EIS, the flood model investigated the cumulative impact of the TPAR plus a representation of this project. Results of DTMR studies indicate an increase in peak water levels (afflux) of the TPAR of 30 millimetres and a combined impact of 50 millimetres.

The hydrodynamic model study undertaken for the EIS used a schematised representation of a Ross River flood discharge equating to a 100 year average recurrence interval (ARI) flood. The EIS model result indicates negligible afflux within the river although elevated water levels of up to 0.2 metres would occur in the vicinity of the detached breakwater. The detached breakwater, although causing local effects, appears to be located a sufficient distance from the river mouth to ensure water levels in the river are unaffected.

DTMR has provided an updated copy of the draft flood study undertaken for the TPAR and an extract of the study report is provided in the SIR. Based on the findings of the study, **I am satisfied** that the marine precinct project, as represented in the EIS, would not affect flood vulnerability of residential areas in the Ross River floodplain.

Notwithstanding the findings of the draft flood study, **I acknowledge** that there may be potential for an alternative configuration of the detached breakwater to cause an increase in flood impacts in the Ross River. Therefore **I have imposed conditions** (Appendix 1, Schedule C, Condition 1) that requires an investigation of its potential impacts on floodplain management if its configuration is different to that described in the EIS.

I am satisfied that the proposed reclamation (without the detached breakwater) would have negligible impact on flooding impacts in Ross River and further flood modelling is not necessary for stage one of the project.

5.2.1.4 Storm tide immunity of the reclaimed land

The EIS reports that the Townsville region is relatively exposed to tropical cyclone impacts and associated storm tides (the addition of storm surge to the normal tidal variation). It is clear that the proposed reclamation needs to be designed to accommodate storm tide hazards to ensure risks to

people and property are adequately addressed. Impacts would be exacerbated by effects of greenhouse climate change and sea level rise.

The draft *State Planning Policy Coastal Protection* recommends a value of 0.8 metres for sea level rise (from 1990 levels) over a planning period to 2100 and provides further guidance on appropriate assessment of storm tide risks. This is based on a review of recent scientific publications and considered to be the best available advice.

The preliminary design of the reclamation sets the finished ground levels at approximately the same level as the adjoining port land (reduced level (RL) 3.65 metres). This level is 1.5 metres above the present day HAT at the site and 0.65 metres above the estimated present day 100 year ARI storm tide level.

The design level of the reclamation should take into account the recommended allowance for global sea level rise and additional potential climate change effects (such as increased tropical cyclone intensities). The design should also consider potential wave overtopping effects given that the detached breakwater may not be constructed in the form described in the EIS.

Based on these considerations, **I find** that the finished level of the proposed reclamation should be specified to be RL4.15 m (i.e. 2 metres above the HAT) unless a detailed risk analysis indicates otherwise. Accordingly, **I recommend** conditions (Appendix 1, Schedule A, Condition 28) that include this requirement.

5.2.1.5 Navigation considerations

5.2.1.5.1 Wave conditions

The current location of marine industry land in Ross River is relatively well protected from wind waves and extreme events although the river entrance is exposed to episodic high velocity flood flows and storm wave conditions.

The EIS included an assessment of wave exposure of the proposed marine precinct site for storm conditions up to the 100 year ARI event. The assessment showed that the detached breakwater, as described in the EIS, would satisfactorily reduce wave energy at the marine precinct during extreme events.

The wave assessment indicated, without a breakwater, wave heights at the entrance of the marine precinct basin would be in the order of 0.8 metres for the 1 year ARI event and 1.5 metres during the 100 year ARI event. These are similar to the wave conditions currently experienced at the river entrance. However due to the wave directions approaching perpendicular to the entrance channel alignment, the wave conditions may present difficulties for vessels navigating the entrance.

Given that the detached breakwater is not proposed for the early stages of the development of the marine precinct, further investigation would be necessary to ensure that navigation safety is acceptable.

Therefore **I recommend** that POTL, in consultation with the Regional Harbour Master, investigates the future need for a detached breakwater or wave screen in the vicinity of the entrance to the project's marina basin.

5.2.1.5.2 Tidal flows

Hydrodynamic modelling for the EIS shows an increase of flow velocities near the ends of the detached breakwater in the order of 0.2 metres per second (100 percent) for spring tide conditions and more for flood flows. The submission to the EIS from the Regional Harbour Master indicates that these velocity increases may compromise navigation safety. In addition, the 'chicane' in the channel alignment would potentially present difficulties with line of sight for vessel operators.

I concur with the Regional Harbour Master's concerns and **I agree** that further design refinements would be warranted before proceeding with construction of the detached breakwater as described in the EIS. Therefore **I have imposed** conditions (Appendix 1, Schedule C, Condition 2) to ensure that navigation safety for vessels in the vicinity of the breakwater structure is adequately addressed.

5.2.2 Coastal sedimentation

5.2.2.1 Coastal morphology

The foreshore of the study area is characterised by muddy sediments interspersed with low sandy beach ridges and partially submerged spit features in the vicinity of the Ross River mouth.

These coastal features are generally comprised of a high proportion of sand. In deeper water the sea bed typically comprises a soft mud layer underlain by layers of silty clay and sand.

The area is exposed to waves and tidal flows with sufficient energy to continually affect the morphology of the area. The EIS provides information on the historical changes to the coastal features adjacent to the Ross River entrance and their ongoing adjustment to artificial influences of the previous port reclamation works and regulation of flows in the river via weirs and the Ross River dam.

Changes to tidal flows and wave conditions caused by the project would have resultant effects on coastal sedimentation patterns in the study area. This has been investigated in the EIS by interpretation of hydrodynamic modelling results and an investigation of longshore sediment transport along the southern shore of Cleveland Bay. This investigation estimates a potential sediment transport rate of coarse grained material (median diameter of 0.4 millimetres) of approximately 25,000 cubic metres per year in the vicinity of the Ross River entrance.

As a result of this sediment transport and the effect of the tidal flows in the river, a low sand spit has formed near the river entrance. This is a significant local feature and, as discussed below, was found to provide a valuable habitat for migratory shorebirds.

The ‘blocking’ action of the existing port reclamation results in a net deposition of coastal sand in the vicinity of the mouth of the Ross River. The river mouth and channel are regularly dredged by POTL to maintain navigable depths. The EIS reports the average extraction rate from the river was 37,600 cubic metres per year between 1971 and 2006. A large proportion of this extraction has been used in the previous reclamation works in the port.

The ongoing dredging of the river entrance has not had a significant adverse effect on the sand spit. The sequence of historical aerial photographs from 1974 provided in the EIS shows a general trend of accretion in the study area including a trend of accretion in the proposed marine precinct site.

The EIS finds that the project would have an effect on the location and configuration of the sand spit. The ‘shadowing’ effect of the detached breakwater would tend to promote the deposition of coastal sediments in its lee with further accretion extending out to the southeast over time. Figure 3-23 of the EIS shows the predicted sedimentation pattern for the reference project. This shows the generally increased potential for deposition of sandy material. If this was to occur, it would be a continuation of the existing trend in this location.

The EIS predicts that the existing channel dredging would continue at a similar rate to that undertaken in the recent past and may initially decrease as a result of the accretion of sediments in the lee of the breakwater.

It is noted that these effects are attributed to the detached breakwater only and that the proposed marine precinct reclamation has negligible impact. If the breakwater structure is not built then the existing coastal sedimentation processes would continue unaffected.

If a modified version of the detached breakwater was to be constructed its design should be carefully assessed to ensure that it doesn’t cause unwanted effects on coastal sedimentation patterns. In particular, the design should ensure that future maintenance dredging requirements of the project are not significantly increased. Therefore **I have imposed** conditions (Appendix 1, Schedule C, Condition 3) that requires that the effects of the breakwater structure on coastal morphology are adequately addressed.

5.2.2.2 Fine grained sediments

5.2.2.2.1 Potential sea bed scour

Due to the nature of the soft muddy seabed sediments in the project area, changes to flow velocities caused by the project may affect sedimentation patterns. An assessment of these potential changes was undertaken for the EIS utilising a model of bed shear stress.

The model results show scouring potential in the vicinity of the detached breakwater as flows are accelerated around its ends. This effect is more pronounced for flood tide conditions than ebb tide flows. The EIS reports that bed shear stress over the remaining study area would be similar to the existing case.

The EIS finds that the changes to bed shear stress near the breakwater would result in minor changes of the erosional and depositional characteristics for a short period of time as the local sea bed morphology adjusts to the new flow regime. **I am satisfied** that the potential bed scour impacts would be manageable. Following construction of a breakwater, bathymetric surveys should be undertaken to assess the rate and extent of scour. If post construction monitoring indicates it is necessary, impacts should be mitigated by appropriate scour protection measures. To ensure any adverse impacts are addressed **I have imposed** conditions (Appendix 1, Schedule C, Condition 3 b) for appropriate monitoring and mitigation measures.

5.2.2.2.2 Riverine flood deposition

During flood events the Ross River has potential to generate relatively high suspended sediment loads. These sediments, eroded from the catchment and the floodplain, are transported downstream into Cleveland Bay and deposited on the sea bed.

The export of flood related suspended sediments was modelled in the EIS with a sediment deposition model. The model examined a case for Ross River flow rates corresponding to a 100 year ARI flood event and assumed an indicative sediment load of 500 milligrams per litre.

The modelling indicates relatively minor changes from the existing situation although it is noted that the marine precinct basin is predicted to experience siltation in the order of 0.5 metre following an extreme event. No significant impacts are predicted for areas adjacent to the project site.

Concerns were raised in a submission to the EIS that the site of the proposed marine precinct presently acts a trap for muddy sediments during floods and that its reclamation could result in a greater export of sediments to Cleveland Bay. This issue was investigated in the SIR by further examination of the flood deposition modelling results. The SIR finds that the proposed reclamation is not predicted to result in the loss of a significant sediment trap for material exiting the Ross River and is therefore not predicted to result in a large increase in sedimentation of Cleveland Bay. **I am satisfied** with this finding.

5.2.2.3 Conclusions – coastal sedimentation

Hydrodynamic modelling and sediment transport assessments for the EIS indicate that the project would have moderate impacts on the local conditions. **I note** that the majority of these effects are attributed to the detached breakwater structure whereas the proposed reclamation would have only a minor influence. **I also note** that if a breakwater is built, it may be in modified configuration as presented in the EIS. Accordingly, careful assessment of the breakwater would be needed during detailed design considering a number of factors to ensure no significant adverse impacts would result.

5.2.3 Marine water quality

5.2.3.1 Context

5.2.3.1.1 Water quality baseline assessment

The EIS describes a substantial amount of existing information available on the water quality environment, both in the study area and throughout Cleveland Bay. A large proportion of this available data has been recorded by POTL.

In addition to the existing data, a project specific baseline water quality monitoring program was implemented for the EIS. The program involved six months of data collection from fixed data recorders (bottom mounted) and monthly vessel based monitoring. The latter data set was obtained from 12 monitoring sites located within the study area in the tidal section of Ross River, adjacent to the project site and seaward of the port area.

The water quality data were compared with adopted guideline values. These were based on *Queensland Water Quality Guidelines (2006)* and the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000).*

The EIS demonstrates that the existing marine water quality in the study area regularly exceeds guideline values. Monitoring results (monthly and continuous data) confirm that the Ross River estuary and the area immediately offshore from the river mouth frequently experiences high levels of turbidity.

As an example, suspended sediment concentrations at the monitoring site in the seagrass area approximately 1.5 kilometres offshore from the port varied up to 1,490 milligrams per litre and had an average concentration of 119.74 milligrams per litre. This is compared to the guideline value of 15 milligrams per litre.

As a consequence of the large variation in turbidity the seagrass areas in the study area regularly experience low light levels. The EIS reports occasions where turbidity at the deepwater seagrass monitoring site was elevated above 50 NTU for sustained periods (hours and days), resulting in very low or no light availability.

The EIS finds a correlation between increased wave action and increased turbidity within the water column. This is consistent with previous assessments of water quality in Cleveland Bay and is attributed to the effect of wind-wave induced sediment resuspension. Additionally, the outflow of sediments from the Ross River estuary during rainfall events was found to influence turbidity levels throughout the study area. The maximum suspended sediment concentration value of 1,490 milligrams per litre was recorded during a high rainfall event in February 2009.

The EIS assessment also notes elevated levels of nutrients compared to the adopted water quality guidelines in much of the data. The EIS attributes this to an anthropogenic input of nutrients, such as sewage effluent and fertilisers from urban and agricultural sources in the Ross River catchment.

5.2.3.1.2 Sediment quality baseline assessment

Sediment quality is monitored as part of the POTL long term sediment monitoring program. Consequently a substantial amount of information is available on the existing sediment quality environment, both in the study area and throughout Cleveland Bay. In addition, an extensive sediment sampling and analysis program was undertaken within the project area.

The sediment sampling undertaken for the EIS indicated the presence of minor concentrations of a number of anthropogenic contaminants. Polycyclic aromatic hydrocarbons (PAH) were identified in low concentrations—these are commonly associated with incomplete combustion of fuels and oils and are likely to be present in the Ross River estuary as a result of the presence of boat traffic and moorings. Nutrient concentrations in sediments were also higher in the vicinity of the Ross River estuary than monitoring sites further seaward.

Minor concentrations of tributyl-tin (TBT) were identified in two sediment samples. TBT is an antifouling agent that was previously used on ships and boats and is now banned although can be present on some older vessels. The likely sources of TBT are boat maintenance activities within the Ross River and from boats and ships in both Ross River and the adjacent port.

Minor concentrations of herbicides were also identified in the sediments of the study area. As was the case with nutrients, this indicates minor inputs of these anthropogenic contaminants from the Ross River catchment, but no long term build up of these contaminants was evident from the monitoring data.

Overall, the EIS finds that the quality of in situ sediments in the study area is compliant with the *National Assessment Guidelines for Dredging (2009)* and the Environment Investigation Levels (EIL) of the *Draft Guidelines for the Assessment and Management of Contaminated Land*.

5.2.3.1.3 Potential acid sulfate soils

Acid sulfate soils (ASS) are a characteristic feature of low lying coastal environments in Queensland. Undisturbed, these soils can be present in an anaerobic state within marine muds and sands in the form of potential acid sulfate soil (PASS). Actual ASS are the oxidised (disturbed) form, which may occur as the result of natural or anthropogenic disturbance from changes in groundwater levels and/or exposure to oxygen.

ASS in an undisturbed environment may have neutral acidity or be slightly alkaline and no visual appearances indicating its acidic potential. However, when exposed to air either by direct excavation or by indirect changes to the surrounding water table, pyritic material inherent in the soil is oxidised by sulphur oxidising bacteria leading to the formation of sulfuric acid. High concentrations of acid released into receiving waters can potentially cause significant impacts on ecosystem health.

Potential acid sulfate soils (PASS) were detected at over 70 percent of sites examined in the study area. The EIS notes that this would affect the ability to re-use some of the material targeted for dredging for reclamation and construction activities.

5.2.3.2 Potential impacts

The SIR discusses the construction of the project over four stages, with the second stage potentially including the construction of an offshore breakwater on the southern side of the Ross River mouth. The key construction processes that have the potential to impact on water quality within the receiving environment include:

- capital dredging to create the access channel, swing basin and harbour basin
- dredging to remove unsuitable foundation material prior to the construction of the breakwaters and revetments
- placement of rock to construct revetments and the detached breakwater
- placement of material behind revetments to create the reclaimed land with potential release of sediments with the tailwater discharged from the settlement pond(s).

The EIS estimates capital dredging works would require excavation of 951,000 cubic metres. The proposed capital dredging would be undertaken by cutter suction dredge with dredged material transferred to the reclamation area via pipeline. The action of the dredge head has the potential to disturb seabed sediments generating turbid plumes and mobilising sediment contaminants into the water column. Construction works also require the placement of quarry material and armour rock into marine waters.

The key operational processes potentially impacting on marine water quality include:

- maintenance dredging of the access channel, swing basin and harbour basin
- discharge of contaminants from various marine industries due to accidental spills of hydrocarbons and other products, stormwater run off and dust.

Maintenance dredging is likely to be similar to the existing rate of channel dredging, in the order of 37,600 cubic metres per year.

5.2.3.2.1 Turbid plumes generated by dredging and construction operations

The EIS included an assessment of potential sediment plumes generated by dredging and construction. The key potential impacts for the project are the effects of elevated suspended sediment concentrations causing increased light attenuation and sediment deposition on seagrass beds and mangrove communities. Plume modelling was based on water movements associated with tidal effects and background wind-wave conditions. The model assumed the continuous release of sediments by a dredge at a rate of 1.2 kilograms per second over a two month period.

The EIS reports that the dredge plume on the ebb tide travels past the port and generally in the northwest direction, dispersing relatively quickly. Model outputs show suspended sediment concentrations at seagrass sites offshore from the port would reach a maximum of no more than one milligram per litre above background levels. Turbidity at sites closer to the dredge and within the ebb tide plume showed predicted increased concentrations of less than 10 milligrams per litre.

Comparing these results with the levels of background suspended sediment concentrations within the study area, **I am satisfied** that these impacts would be minor.

Modelling also examined the risk of increased sedimentation rates on seagrass communities in the vicinity of the proposed dredging works. Studies for the EIS indicate that when the dredge is positioned in the mouth of Ross River, sedimentation would not exceed one millimetre at the deepwater seagrass bed located offshore of the Ross River mouth over two months of dredging. Given the likelihood that these sediments would be resuspended and further dispersed during conditions caused by strong winds, **I am satisfied** that the predicted level of sedimentation would not have a significant negative impact on the seagrass beds in the vicinity of the project.

5.2.3.2.2 Mobilisation of contaminants into the water column

The sediment quality assessment in the EIS finds that, although minor levels of contaminants were detected, the overall quality of dredged material would be suitable for at-sea disposal and/or fill in the reclamation works. In addition, given the hydrodynamics of the study area causes a relatively rapid dispersal of plumes, **I am satisfied** that the proposed works are unlikely to release quantities of contaminants into the water column that would cause significant adverse impacts.

It is possible that dredging works could result in the introduction of elevated nutrient levels into the water column over short periods. If these periods coincide with favourable conditions (i.e. warm, clearer waters with good light penetration) it may be possible that nuisance algal blooms are triggered. However, the EIS reports that the main forms of nutrients found in sediments were not biologically available forms and nutrients are already present in the water column in significant concentrations. In addition, the EIS observes that algal blooms in the Townsville region have not been correlated with previous dredging events. **I am satisfied** that it is unlikely that dredging activities for the project would promote conditions conducive to algal blooms.

5.2.3.2.3 Management of potential acid sulfate soils (PASS)

Geotechnical and acid sulfate soil investigations for the EIS found some PASS material that may not be suitable for use in construction of the project without treatment and management.

It was originally envisaged that much of the dredged material would be disposed offshore in the POTL Cleveland Bay disposal site thus minimising oxidation of acid sulfate soils. The SIR notes that, due to the reconfiguration of stage one of the project, the majority of capital dredging material is intended to be used in the reclamation, as opposed to ocean disposal.

When disturbing large volumes of PASS there is the potential to cause significant long term environmental harm and corrosion to built infrastructure. Given the extent of PASS identified in the EIS assessment and the proximity of the works to sensitive marine environments, the dredged material will require careful monitoring and management of potential impacts. A draft acid sulfate soil management plan has been developed for the project and was provided in the EIS (Appendix H). POTL has committed to finalising this plan, following completion of the detailed design phase, to satisfy the relevant guidelines.

To ensure the implementation of the management plan and the appropriate management of potential acid sulfate soils, **I have imposed** a condition (Appendix 1, Schedule C, Condition 5) that must be attached to a development permit for the project.

5.2.3.2.4 Management of water discharged from reclamation works

The reclamation component of the project would involve enclosing parts of the site with bund walls and progressively filling the areas using dredged material. The principal management issue in this process is to ensure the discharged tailwater is suitably treated to avoid adverse impacts to receiving waters. The EIS discusses the management of the construction process and provides a number of recommendations to minimise potential for adverse marine water quality. In summary the proposed measures include:

- developing appropriate water quality criteria for all water released from the site
- providing containment ponds within the project site to settle, and treat, water prior to discharge. Treatment may be required to neutralise acidic waters and/or promote flocculation of fine sediments

- compliance testing against approved discharge criteria prior to release
- monitor water quality at sensitive habitats for compliance to site specific water quality objectives. Undertake construction management responses to any observed deviations from water quality objectives
- if turbidity levels exceed allowable thresholds for receiving environment due to dredging effects consider use of silt curtains to contain impacts or adoption of different dredge activity profiles (duration/frequency).

These measures are included in the draft environmental management plan for the project, to be finalised before commencement of construction.

5.2.3.2.5 Operations

The EIS provides details of the likely configuration for stage one of the project. The detailed layout and composition of later stages has not yet been determined and would be developed according to demand and availability of allotments. The principal activities are likely to be based on maritime-related fabrication and maintenance industries along with the operation of a commercial marina. This would include provisioning, refuelling, sullage, small scale retail and seafood industry cold storage and distribution.

Potential risks of impacts to marine water quality would arise from sources such as stormwater runoff, accidental spills, waste disposal and airborne emissions. The EIS discusses the operational management of the marine industry precinct and provides a number of recommendations to minimise risks of adverse marine water quality. In summary the proposed measures include:

- provision of appropriate waste disposal facilities for moored boats
- install appropriate stormwater management measures
- adequate storage and bunding of potential contaminants
- use dust suppression where required during building and landscaping.

POTL has committed to implement these measures as part of the EMP for the site. At completion of construction, all operational aspects of the project's EMP will be included and maintained as part of the port's environmental management system (EMS). In addition, individual businesses would be required to operate in accordance with a development approval for each ERA that applies.

5.2.3.2.6 Maintenance dredging

Maintenance dredging will be required regularly to maintain the access channel, swing basin and harbour basin to maintain navigational safety. The EIS estimates that, based on current maintenance dredging for the Ross River, it is likely that dredging will be required biannually. Channel dredging would be undertaken by a trailer suction dredger and possibly disposed at POTL's Cleveland Bay disposal site. The EIS predicts that dredging in the harbour basin should not be required as frequently and is likely to be undertaken by a cutter suction dredge.

Maintenance dredging of the marine precinct will be managed as part of the ongoing maintenance program in the port and would be required to operate in accordance with the necessary ERA licence. Sediment quality will be analysed prior to any dredging and appropriate disposal locations identified based on the level of contamination that may be present in the material to be dredged. Impact mitigation measures and monitoring programs to minimise impacts on the receiving environment, in particular water quality, would be implemented in accordance with the required permits.

Disposal of dredged material to the Cleveland Bay disposal site would be subject to the requirements of the permits issued by the Commonwealth Government in accordance with the *Environment Protection (Sea Dumping) Act 1981*.

5.2.3.2.7 Ground water and surface water

During investigations for the EIS, historic groundwater monitoring data for the area was reviewed. Four groundwater bores of relevance to Lot 773 were monitored over a three month period, including

conditions of extensive rainfall and flooding to ascertain ground water flow direction, levels and water quality.

Groundwater impacts from the marine precinct during reclamation works may include an increase in levels and the direction of flow until an equilibrium is reached. Contamination of the watertable is possible if construction is not managed appropriately. Alteration of natural surface water flow directions may also occur if land built barriers are constructed.

The EIS finds that material placed within the reclamation will develop a shallow water table connected to the existing water table in adjacent areas. Groundwater flow through reclamation material is likely to be towards the east or south east towards Cleveland Bay. The EIS acknowledges that design approaches for the project should take into account the ground water flow directions, levels and potential contamination matters, potential cumulative impacts upon these systems.

Given the direction of groundwater flow, additional groundwater bores may be required once the reclamation area is established. Groundwater monitoring for all parameters should be conducted monthly during the construction phase in order to ensure early detection of any adverse impacts.

Soil erosion during construction is to be controlled in accordance with the Environmental Management Plan (EMP) developed for the project and a sediment and soil erosion management.

To minimise potential adverse impacts on marine water quality from contamination of groundwater, **I have imposed** a condition (Appendix 1, Schedule C, Condition 6 f) relating to groundwater monitoring during construction of the project.

5.2.3.3 Conclusions – marine water quality

Water quality monitoring data indicate that the study area, encompassing the project site and the adjoining waters of Cleveland Bay, frequently experiences highly turbid conditions. In addition, elevated levels (compared to the relevant guidelines) of nutrients and other contaminants were observed in the vicinity of the Ross River estuary. Coastal sediments also exhibit some low level contamination (below acceptable limits) in a few locations and, more generally, potential for acid generation.

EIS findings indicate that site specific measures should be developed to manage potential construction water quality impacts. Ongoing monitoring of turbidity and nutrient levels during construction, and for a period post construction, will be required to detect adverse trends in water quality related to dredging and other construction activities. Early detection would enable active management of these impacts prior to their affecting any sensitive ecosystem receptors, including seagrass meadows. The proponent has committed to the management of potential impacts through the implementation of environmental management plans.

I note the extent of similar dredging and reclamation works that have been successfully undertaken by POTL in developing port land and operating the port and **I am confident** that similar, or better, management would be applied in the construction of the project.

To ensure the appropriate management of marine water quality, **I have specified** a range of approval conditions (Appendix 1, Schedule A, Conditions 1-21, and Appendix 1, Schedule B, Conditions 4-6 and 16) that apply to the project.

5.2.4 Marine fauna and flora

5.2.4.1 Context

This section of the EIS evaluation report addresses nature conservation matters relating to Queensland state jurisdiction. Matters of national environmental significance that are controlling provisions under the EPBC Act are discussed further in section 6 of this report.

The principal ecological impacts associated with the project concern marine fauna and flora, and water quality. The EIS recommends a range of actions, including further studies, monitoring, and construction and operational activities intended to avoid or minimise adverse impacts upon the natural values.

The marine precinct project area, Lot 773, is located near the mouth of the Ross River and is approximately 34 hectares of shallow tidal sand/mud flats with an artificial rocky foreshore along the northern edge bounding the eastern reclaim area of the port. A small area (approximately 1.5 hectares)

of non-remnant marine (mangrove) vegetation has recruited at the base of the seawall. The EIS has assessed this vegetated area to be of low ecological integrity and severely degraded with weed infestation.

Investigations for the EIS indicate that the project area supports a range of intertidal and sub tidal soft sediment marine communities. Crabs, snails and worms were commonly found although overall species diversity and abundance were not more significant than adjacent areas.

Seagrasses were found offshore of the project area and mangroves were also common fringing the nearby waterways. Various commercially and recreationally targeted fish and crab species were found throughout the study area but none of these were restricted to the project site.

5.2.4.2 Marine megafauna

Boat-based and aerial marine megafauna survey were conducted for the EIS over a seven month period from September 2008 to May 2009 (EIS Appendix U) and included three days of aerial surveys (two surveys per day, high and low tide) and seven monthly boat-based surveys (not including February and April). Turtles, dugongs, rays, sea snakes and dolphins were observed but none of these were shown to be exclusively using the project area.

The following species listed as threatened under the Queensland *Nature Conservation (Wildlife) Regulation 2006*, pursuant to the *Nature Conservation Act 1992*, were observed within the study are:

- endangered
  - loggerhead turtle (*Caretta caretta*)
  - leatherback turtle (*Dermochelys coriacea*)
- vulnerable
  - dugong (*Dugong dugon*)
  - green turtle (*Chelonia mydas*)
  - hawksbill turtle (*Eretmochelys imbricate*)
  - flatback turtle (*Natator depressus*)
- rare
  - Australian snubfin dolphin (*Orcaella heinsohni*)
  - Indo–Pacific humpback dolphin (*Sousa chinensis*).

The migratory bottlenose dolphin (*Tursiops sp.*) was also observed.

Conservation plans, in accordance with the *Nature Conservation Act 1992*, are in place as follows:

- Nature Conservation (Whales and Dolphins) Conservation Plan 1997
- Nature Conservation (Dugong) Conservation Plan 1999
- Recovery Plan for Marine Turtles in Australia 2003 (national/state).

During studies for the EIS none of the key marine fauna species surveyed were observed within the immediate footprint of the project area, although they were in close proximity (less than two kilometres). The EIS finds that the project area is not an area of high utilisation for marine migratory megafauna species. This was expected as the project area is a shallow tidal sand/mud flat that dries at low tide and does not support preferential feeding or breeding habitat. Seagrasses do not occur within the project area.

Concerns were raised by submissions to the EIS relating to potential marine megafauna impacts. These included:

- direct (reclamation) and indirect (increased sedimentation/degraded water quality) loss of marine megafauna migratory, feeding habitat, including snubfin and Indo–Pacific humpback dolphin habitats in Cleveland Bay
- impacts on marine faunal habitats and usage of habitats resulting from hydrological change in both the Ross River mouth and inshore estuarine area as a result of the development

- increased potential for boat strike of megafauna resulting from increased vessel traffic.

Further discussion relating to dugongs, turtles and dolphins is provided as follows.

5.2.4.2.1 Dugongs and marine turtles

Cleveland Bay is a dugong protection area declared under the *Fisheries Act 1994* and dugongs are relatively abundant, although they are not known to frequent areas close to the Port of Townsville. The EIS (Appendix U) found that dugongs were found in areas with greater concentration of seagrass in Cleveland Bay. They were reported to be most frequent along the south-west shore of Magnetic Island and the eastern and south-eastern shores of Cleveland Bay near Cape Cleveland.

The EIS found that seagrass distribution in the bay is broadly similar between seasons and covers the majority of port limits. This suggests that given the dependence of dugong and green turtles on seagrass as a food resource, their presence in Cleveland Bay would remain relatively unchanged throughout the year.

5.2.4.2.2 Dolphins

The EIS reported that the Australian snubfin dolphin and the Indo–Pacific humpback dolphin are highly mobile and move in and out of Cleveland Bay.

Two snubfin dolphins were observed during the seven month field surveys for the EIS. Based on previous studies snubfin dolphins have been observed to concentrate their activity around two areas, north-west of Cape Pallarenda, and south around Townsville's Port and Ross River mouth.

Humpback dolphins show a similar distribution, concentrating their activities mainly around the dredged channels and breakwaters close to the Port of Townsville, without a clear seasonal pattern.

5.2.4.3 Potential impacts – general

The EIS investigated the following potential impacts to marine fauna and habitat:

- the permanent loss of fish and benthic habitats
- ongoing disturbance within and adjacent to the development from dredging of navigational channels, construction of breakwaters and resulting turbidity, sedimentation and mobilisation of contaminants from sediments
- contamination of marine waters from sediment disturbance, spills of fuel or other chemicals, stormwater runoff animal waste (feline pathogens)—feral or domestic
- trapping of marine fauna by the reclamation works
- injury/mortality to individual animals from direct contact related to construction activities or boat strike
- noise and vibration impacts to marine fauna from in-water construction or ongoing operational activities.
- lighting impacts to nesting turtles and hatchlings in the area (November—April).

The ecological values of the south bank of the Ross River, including an offshore sand bar, and potential impacts to this area as a consequence of the project, were also investigated by the EIS.

5.2.4.3.1 Habitat value of the development site

Potential and probable impacts associated with the reclamation on marine ecological values include removal of benthic organisms, reduced use of the area by marine fauna, and increased disturbance to marine habitats.

The EIS finds that the project area is not considered to be a community or ecosystem of high value either in its own right or as a critical feeding ground for other higher-order species. Loss of this relatively small area of seabed is not expected to have a negative effect on the importance of the benthic marine habitats of the Townsville region. Nor is it anticipated to affect biodiversity of the region or affect the habitat utilisation patterns of marine megafauna within the area.

Creation of interstitial rocky shore habitat both intertidally and sub tidally through provision of rock revetment walls of the precinct and development of the breakwater may also partially mitigate and offset some of the habitat losses associated with direct removal. Accordingly **I have imposed** a condition (Appendix 1, Schedule C, Condition 4 a) to promote the best management of habitat value of marine structures associated with the project.

The hydrodynamic investigation for the EIS indicates local changes to tidal velocities in the immediate vicinity of the detached breakwater. However this would affect the hydrological characteristics of the project area, including the lower estuary and mouth of the Ross River. Sediment transport modelling investigations for the EIS find no significant adverse impacts would occur to marine habitat through degraded water quality or excessive sedimentation.

The Department of Employment, Economic Development and Innovation (DEEDI) has advised that the Queensland Government Environmental Offsets Policy is triggered by the permanent removal of fisheries habitats and ongoing temporary disturbance that will be caused by the project and its operations.

A number of potential offsets were nominated by DEEDI for consideration. However, the government's announced commitment to the expansion of boat ramp facilities in Townsville at the current Rosshaven Marine site and at nearby Barnicle Street has been accepted by DEEDI as an appropriate offset for the project.

In the opinion of DEEDI, these two locations in Ross River are the optimal locations in Townsville to provide for safe, all-tide, all-weather recreational boating facilities and have the least impact on local fish habitats of all the sites investigated in the Townsville area for these facilities. The arrangements for the provision of the recreational boating facilities have been delegated to DTMR.

5.2.4.4 Potential construction impacts

There is no seagrass present within the direct project area, hence any impacts to adjacent seagrasses would be indirectly due to construction and operation (e.g. maintenance dredging) and likely to be minor in relation to the overall extent of dugong seagrass habitat in Cleveland Bay. As discussed in section 5.2.3 of this report, potential sensitive habitat loss due to sedimentation is not considered likely so is not considered to be a threat to megafauna from construction or operation of the project.

Marine fauna are expected to temporarily vacate the surrounding habitats during dredging and reclamation works, therefore trapping and fatalities are unlikely. Furthermore, Lot 773 is largely within the intertidal zone so if construction occurs during the higher tidal range, species will have opportunity to move out of the area or swim away from the stationary dredger. If construction occurs during the lower tidal range, the mouth of the bund can be closed at low tide after fauna have vacated the area to prevent re-entry.

A range of potential mitigation measures are identified in the EIS, including use of fauna spotters and equipment soft-starts to minimise potential impacts to marine megafauna and avoiding marine habitats used frequently by marine fauna during dredging, spoil disposal and construction. These strategies have been incorporated in the draft EMP for the project.

I note that POTL has committed to the following monitoring studies to address impacts to marine habitats and megafauna:

- Monitor the health of adjacent seagrass communities as indicators of water quality impacts and to act as an indicator for potential impacts to marine megafauna.
- Monitoring of temporal and spatial persistence of meadows compared to existing baseline data.
- Consideration be given to ongoing marine megafauna monitoring to assess any influence on habitat utilisation of threatened and listed species. If marine fauna are sighted during dredging activities the dredge should avoid moving into that area if capture or strike is likely.

5.2.4.4.1 Underwater noise

A review of underwater noise impacts studies, in relation to in-water construction works completed for other shallow marine dredging and reclamation works projects (e.g. Gladstone Western Basin Dredging and Disposal Project) are of direct relevance to the marine precinct project. That review examined the acoustic intensity and frequency of noise sources relative to the known sensitivity ranges for marine

mammals. The study indicated that of all potential noise generating activities pile-driving was most likely to have an impact.

Physiological impacts on marine mammals arising from underwater construction noise were assumed to be insignificant as the noise would be detected by the animals well before the animals would reach the distance from the source established as the 'impact zone' (less than five metres). Precautionary mitigation measures, including soft-start pile-driving, use of spotters, no pile-driving if megafauna are observed within five metres, and use of warning noises prior to pile-driving, have been included in the draft EMP for the project.

Subsequent to the EIS, POTL has indicated that additional monitoring and assessment of noise related impacts on marine megafauna would be undertaken during stage one construction works. This would provide a basis for improved practices during the project's construction and would add to the body of knowledge generally.

5.2.4.5 Potential operational impacts

5.2.4.5.1 Boat strike risk

Considered alone, the project is not expected to significantly increase the volume of boat traffic in the area given that the proposed marine precinct facility is primarily designed to relocate existing industrial users from the existing Ross River industry precinct.

Construction of new recreational boat launching facilities in the Ross River, although not an impact associated with the project, would result in a cumulative increase in boat traffic.

Dugongs and turtles are known to be vulnerable to injury or mortality from collisions with fast moving boats. As an example, the Moreton Bay Marine Park has introduced a number of 'go slow' management areas to reduce the incidence of collisions with dugongs and turtles. Dolphins are highly mobile species and not as vulnerable to boat strike injuries as dugongs although, relative to their population size, are more likely to be present in the vicinity of the port environs than dugongs.

The EIS reports that the key marine megafauna species have a higher presence in areas of more suitable habitat, i.e. in deeper water near the port and, for dugongs in particular, seagrass meadows at the southern section of Cleveland Bay. The likelihood of animals transiting between high usage habitat areas was considered. Based on all available information, no distinct transit pathways or migratory pathways for marine megafauna have been discernable either within the vicinity of the project area or the wider Cleveland Bay area.

The risk assessment for marine ecological values undertaken for the EIS (EIS section 3.10 and table 3.55) identifies potential boat strike of marine megafauna as a high risk and proposes additional boat speed restrictions to mitigate impacts. However given the levels of boat traffic already in the port environs and no reported incidences of collision related injuries to dolphins it is unlikely that an increase in traffic would significantly increase the risk to dolphins.

I have been advised by the Regional Harbour Master that the existing boat speed limits in the Ross River (6 knots applying to all vessels) are likely to be extended to the vicinity of the marine precinct for the purposes of navigation safety. In the event that an offshore breakwater is constructed, it is likely that additional restrictions would apply in the channel to the seaward limit of the breakwater.

5.2.4.5.2 Lighting

Cleveland Bay is not recognised as a major nesting area for marine turtles along the Queensland coast, however low density nesting by flatback turtles and green turtles does occur in nearby locations including The Strand, Pallarenda and Magnetic Island.

No records of turtles nesting on Lot 773 or coming close to the Ross River en-route to nesting beaches have been made. Although no nesting or evidence of nesting turtles has been reported on the western side of Cape Cleveland it is conceivable that turtles may utilise sandy beaches near the mouth of Ross River.

Excessive construction or operational lighting would have the potential to disorient nesting or hatching turtles in the vicinity of the project. The EIS provides a number of mitigation strategies to reduce the risk

of light spill into marine environment. These strategies have been incorporated in the draft EMP for the project.

5.2.4.6 Conclusions – marine megafauna

The construction of the project is not expected to have a significant impact on the key marine mammals and reptile species, either in terms of direct disturbance to important habitat, construction noise, or disruption of transit routes between patches of preferred habitat.

The operation of the marine precinct may alter vessel traffic at the Ross River mouth, however, the project would not generate significant increases in traffic (as the marine precinct caters primarily for the relocation of marine industry business presently upstream in Ross River) and cause an increased potential for boat strike injuries.

The draft EMP has included a number of measures to avoid and minimise potential impacts on marine fauna. These include mitigation of potential impacts from underwater noise (including use of fauna spotters and equipment soft-starts) and design of lighting systems to reduce the risk of light spill on marine fauna. These measures are included in the draft environmental management plan for the project, to be finalised before commencement of construction.

In addition POTL has committed to continuation of seagrass and marine megafauna baseline monitoring and undertaking research on the interaction of marine megafauna with construction noise. **I have imposed** conditions (Appendix 1, Schedule C, Conditions 8-9) to ensure the implementation of these commitments.

Based on the above considerations, **I conclude** that the project does not pose a significant risk to marine fauna in the project area or the wider Cleveland Bay area.

5.2.5 Shorebirds

5.2.5.1 Context

The mud flat and sand bank seaward of the mangroves on the eastern bank of the Ross River provide a critically important wading and migratory bird roosting area of regional significance. This area is highly utilised by species protected under international conservation agreements and under the *Nature Conservation Act 1992* and EPBC Act (see also section 7.2.5 of this report).

A public submission to the EIS expressed concern that the shorebird feeding and roosting habitat on the intertidal area of the east bank of the Ross River would be disturbed by increased visitor access and activities such as dog walking, bait fishing and beach picnicking.

The EIS advises that the critical wading and migratory wader bird habitats on the eastern side of the Ross River should not be impacted by increased visitor access and use. The disconnection of the proposed breakwater from land aims to mitigate against potential disturbance of this area and protect these birds from disturbance. Much of this area is reserved for conservation purposes and no adverse impacts to the site are expected from the project.

Sediment transport modelling for the project indicates the potential for the sand spit at the mouth of Ross River to accrete at a greater rate than current trends. This would not fundamentally alter the character of the area and its value as a shorebird roosting habitat.

5.2.5.2 Conclusions – shorebirds

I am satisfied that the project site, on Lot 773, is not an important or critical habitat for the listed migratory bird species. **I am further satisfied** that the final design of the offshore breakwater structure, and the construction and operation of the project, would not have adverse effects on the listed migratory birds in the vicinity of the project area, in particular the shorebird feeding and roosting habitat on the south-east bank of the Ross River.

5.3 Social, economic and visual impacts

5.3.1 Social

5.3.1.1 Context

Community consultation undertaken for the EIS identified the major activity undertaken in the project area was recreational boating (48%). Other popular public uses of the project area included: walking dogs (20% of all activities), walking or jogging (13% of all activities), fishing (8% of all activities), activities undertaken in cars (e.g. talking, eating meals, enjoying the view) (5% of all activities) and other activities (e.g. taking pictures, kayaking, kids playing) (4% of all activities).

Several public submissions were concerned that the project would result in the loss of mudflats (Lot 773), which has been used by recreational fishers for collection of bait (yabbies, crabs and worms) and by the broader community as an off-leash dog area.

Over 300 submissions were received to the EIS relating to the perceived lack of recreational boating infrastructure in the Townsville region. While outside the scope of the project, the proposed development of a new marine precinct was seen to offer an opportunity to provide new facilities. In its response to the EIS, the Townsville City Council (TCC) also raised concerns about the lack of recreational boat ramps as a key issue.

TCC also indicated concerns with the proposed redevelopment options for existing industry lands upstream of the proposed project site that will be vacated by businesses relocating to the marine precinct. In its submission to the EIS, TCC was concerned that the identification of land redevelopment options was beyond the scope of the project and pre-empted other planning processes.

5.3.1.2 Proponent's response

The EIS, while noting that the project site has been designated for development for many years, acknowledged the loss of public access to the coast and the loss of mudflats for recreational uses.

While it will not be possible to replace the beach environment lost to the development, POTL has sought to identify alternative potential coastal recreation opportunities.

The EIS indicated that upstream industrial lands vacated by industries relocating to the marine precinct may provide opportunities for incorporation of alternative recreation opportunities.

Given the intended staged delivery of the marine precinct, public access to the southern section of the site that comprises the later stages of the project will continue to be available for between five to ten years from commencement of construction. Access may also be available beyond this timeframe depending on future demand for industry land.

The EIS presented conceptual redevelopment options on land upstream of the marine precinct that may be vacated by the relocation of marine industry businesses. Port master planning processes will consider what uses are feasible for these areas once vacated and rehabilitated. POTL has committed to appropriate consultation with TCC and others during this process. **I note** that any future proposals for redevelopment of the upstream lands will occur in accordance with the relevant statutory planning and development approval processes.

Any redevelopment of vacated upstream land would be required to meet the planning objectives for the South Townsville Precinct as identified in the Townsville City Plan. All new development is required to be assessed on a case-by-case basis in accordance with the SPA. **I agree** that the potential redevelopment options identified within the EIS were presented as conceptual only and were not intended to circumvent the appropriate planning and approvals processes.

5.3.1.3 Boat ramp facilities

Although the potential for recreational boat ramps was canvassed in early planning for the marine precinct, the project as currently formulated in the EIS does not contain recreational boat ramps.

POTL considers that the commercial viability of a marine precinct in this location would be compromised by the loss of land to recreational boat ramps and carparks. Also, POTL considers that the interaction of

recreational boating with commercial marine industries would introduce the potential for unacceptable safety risks. **I concur** with POTL's views on this matter.

As a result of general public demand for recreational boating facilities in Townsville, in January 2010 the Queensland State Minister for Main Roads, announced funding to provide 14 new boat ramp lanes for the recreational fishing and boating community. Relocation of current marine businesses will free up land upstream in Ross River that may, in part, be used to create a new recreational boating facility for the community. Funding was also allocated for an additional two-lane boat ramp and 100 additional car trailer parks to be built at the existing Barnicle Street facility.

5.2.4.7 Conclusions – social

Whilst the Queensland Government initiative to provide new public boating recreational facilities in part addresses public and agency concerns raised in submissions to the EIS, **I consider** that the development of new public recreational boating facilities is not a direct consequence of the Townsville Marine Precinct project although it does provide for an acceptable offset to the project's impacts on marine fish habitat. The assessment of new public recreational boating infrastructure is outside the scope of this evaluation report and **I note** that its delivery will be addressed separately through state agencies and TCC.

5.3.2 Economic

5.3.2.1 Context

A number of public and agency submissions to the EIS identified impacts of the TPAR bridge affecting access to the existing marine industry area within Ross River. The concerns were broadly associated with:

- ensuring the full extent of the economic impacts of the proposed relocation of businesses to the new marine precinct was fully understood
- that the facilities in the new marine precinct would be suitable to accommodate existing businesses and also allow for future expansion and consolidation of the industry.

The actual impacts of the TPAR bridge on the existing marine industry in Ross River have been investigated as a part of the planning for the marine precinct project. This has been based on studies undertaken for the EIS and from submissions from industry representatives. The EIS acknowledges the operational constraints on some vessels currently accommodated in Ross River imposed by the limited navigable clearance of the bridge (i.e. 6 metres). In particular, the local trawler fleet could not practically remain based in its present location.

As an adjunct to the EIS process, POTL commenced negotiations with individual upstream business owners with the intent of addressing the majority of their concerns relating to the economic impacts from the project.

In addition, the government announced a funding package for construction of stage one of the project with a timeframe to meet that of the TPAR bridge construction schedule. The objective of the funding is to support the continuation of marine industries affected by the TPAR bridge and minimise any commercial disadvantages.

5.3.2.2 Conclusions – economic

I am confident that POTL has consulted and provided opportunity for individual marine industry businesses to include specific requirements in the design of stage one of the project. The final commercial arrangements are beyond the scope of my assessment of the project.

The breakwater structure is unlikely to be constructed as part of stage one of the marine precinct because a protected berthing environment has been provided within an inner harbour. A breakwater is envisaged to be required only if the external face of the reclamation is to be used for berthing vessels in the later stages of the marine precinct development.

5.3.3 Visual amenity

A visual impact assessment for the project was undertaken and is included as Appendix N of the EIS. The project site is located within an area that has existing industrial development including both port and land-based activities (EIS section 3.3). Therefore the project will contribute to the continued industrialised landscape character of the locality. This is particularly exacerbated by the reclamation of Lot 773, which presently includes frontage to Ross River, albeit itself reclaimed and highly disturbed.

The assessment of visual impacts to the landscape resulting from the project construction (EIS Appendix N) considered those impacts to be of moderate significance.

The visual character of the marine precinct is considered to be consistent and integrated with the maritime industry of the Port of Townsville. The marine precinct is sufficiently removed from residential areas to have little or no visual impact upon residential amenity.

I am satisfied that the visual character of the marine precinct is consistent with the existing marine industry of the Townsville Port, and that the loss of Ross River foreshore associated with the reclamation of Lot 773 does not constitute a significant adverse visual impact.

I am further satisfied that the marine precinct is sufficiently removed from residential areas to have little or no visual impact upon residential amenity.

5.4 Infrastructure and services

5.4.1 State controlled roads

5.4.1.1 Context

The project site currently fronts onto Benwell Road (EIS Figure 3.9). The primary access point for the completed development is intended to be at the southern end of the reclamation opposite Boundary Street. Access for earlier stages would be to the north of Archer Street.

Completion of the first stage of the marine precinct construction is expected in December 2011and completion of the Townsville Port Access Road (TPAR, or 'Eastern Access Road') is expected to by late 2012. Construction and operational traffic to the marine precinct would then be via the TPAR following its completion.

The primary road transport routes through South Townsville, for haulage of construction materials and for operations prior to completion of the TPAR, are shown by the EIS Figure 3-10.

A Traffic Impact Assessment (TIA) was undertaken to provide details of potential traffic and transport infrastructure impact and mitigation measures that may result from the development of the marine precinct (EIS Appendix M). The TIA provides detailed traffic flows and volumes for key road access routes and intersections, and recommends solutions for key intersections to achieve appropriate traffic flow.

The TIA concluded that the generation of traffic related directly to the construction and operation of the project is not considered to have a significant impact on the functionality and performance of the existing road network and infrastructure. The TIA results show the Boundary Street/Saunders Street and Benwell Road/Archer Street intersections may require future upgrading, based primarily on an increased growth in background traffic in the area.

In its response to the EIS, DTMR raised a number of key concerns regarding impacts on state controlled roads:

- the TIA would need to be reviewed and updated for later stages of the project to ensure future traffic demand (trip generation, vehicle types etc) and peak times will be accommodated by the road network
- further detail would be needed on road impacts (safety, efficiency and pavement life) caused by the various activities (dredging, fill, construction, operation) at later stages of the project's development (construction, operation)

- the TPAR includes provision for multiple rail tracks and the access to the marine precinct will require a grade separated crossing of the rail corridor to ensure safe access.

Additional issues and concerns relating to transport and traffic included:

- possible adverse impacts of stormwater flows from the marine precinct on state-controlled road infrastructure, including bridges and culverts upstream
- the possible inclusion of dry berths and private moorings within the project and to ensure adequate parking (on street and off street) facilities and access is provided
- as the marine precinct is a future employment generating hub, public transport facilities (i.e. a traversable public transport bus route and bus stop/s) should be provided
- that the EIS has no analysis of the opportunity to use rail transport in the construction and operation of the marine precinct (e.g. alternative methods of importing fill by road to be examined).

5.4.1.2 Proponent's response

The TPAR rail and road corridor detailed design was not finalised at the time of the EIS. However, the traffic assessment based on the proposed TPAR configuration available at that time concluded that it would be feasible to achieve entry to the marine precinct across the TPAR with appropriate design solutions, and that significant impact to adjacent traffic flows and residential areas would not eventuate.

In its response to the DTMR submission, POTL considered that no further analysis of traffic or road impacts (including pavement conditions) was required because no significant impacts from the construction or operation of the marine precinct on transport corridors and traffic flow were identified.

POTL considers that it can only provide DTMR with finalised design details for identified access roads, intersections and parking at staged intervals, following construction but prior to operation of each stage of the project, based upon the actual occupancy characteristics of the marine precinct.

Rail transport was examined as an alternative to road for fill transport during the EIS but considered unfeasible. There are currently no rail lines adjacent to the marine precinct for unloading and few quarries with rail access. If rail was available at a suitable quarry there would be a need for double-handling of fill—unloading of trains at the nearest siding and reloading into trucks for transport from there to the marine precinct.

The EIS (section 2.2) makes provision for 40 private moorings, for vessels currently on buoy and pile moorings in Ross River, was made within the marine precinct in the lee of the breakwater.

Pile moorings are, however, not expected to be constructed during stage one of the project, and will only eventuate within the marine precinct if a proponent wishes to pursue the implementation of these facilities. The detailed design will not exclude potential for these facilities, however, parking, access and safety for these facilities will be achieved when required.

5.4.1.3 Conclusions – state controlled roads

I am satisfied that the Traffic Impact Assessment undertaken for the EIA has adequately identified that stage one of the project would not generate significant traffic growth nor have a significant impact on the functionality and performance of the existing road network and infrastructure during construction and operation. **I acknowledge** that this assessment will need to be reviewed for the later stages of the project as more detail becomes available on the occupancy of the marine industry land.

Based on discussions with DTMR, **I have imposed** conditions (Appendix 1, Schedule C, Conditions 10-12) to ensure impacts on the state controlled road network are appropriately managed and that other concerns are addressed relating to the rail crossing, stormwater flows, public transport and on-site parking.

5.4.2 Local roads

The EIS reports that the project would not impact upon the local road network. TCC has confirmed that stage one of the project will not create issues for the local road network as it is directly connected to the state controlled network. Council is currently reviewing the road hierarchy in the South Townsville area,

including the use of McIlwraith Street. Consultation with POTL will take place to determine the appropriate long term road hierarchy for this area.

5.4.3 Water, wastewater and other services

The project site is currently an intertidal marine sand/mud flat and there is no existing infrastructure servicing it. New services infrastructure, such as underground electricity, water and telecommunications would need to be provided as part of the project.

TCC raised concerns regarding the connection of power, water, sewerage and stormwater services to Council infrastructure; associated flow volumes of water and sewerage; and the locations of stormwater outlets and discharge to Ross River.

Electricity demand is expected to be substantial but the EIS identifies that adequate infrastructure exists to achieve the required demands (EIS section 2.6.4). An existing Ergon Energy substation located on Hubert Street is expected to meet demand supply needs and POTL is working with Ergon Energy to facilitate routing of this service into the marine precinct.

The EIS identifies that a 300 millimetre diameter AC water main in the Benwell Road corridor has sufficient capacity to service the marine precinct.

No sewerage treatment plant would be provided on site. Sewerage from the marine precinct would be connected to TCC mains infrastructure at an agreed connection point. The EIS identifies a 150 millimetre diameter sewer main on the southern side of Boundary Street. However, it is believed that in order to service the marine precinct, at least one pump station and rising main will be required to convey the sewage to the connection point with TCC infrastructure. Potential impacts of this additional infrastructure will be considered during the detailed design of the marine precinct for each industry on site, and will be discussed with TCC where plans involve connection to TCC infrastructure.

The EIS reports that extensive discussions have been held between the proponent and TCC on the matter of providing adequate water and sewerage services to the site. The EIS concludes that augmenting the existing infrastructure is manageable and similar to works required for other new developments. TCC has advised that the water and wastewater infrastructure required for the development has not been included within Council's headworks policy and must be provided at the proponent's expense.

I am confident that adequate services can be provided to the marine precinct project.

5.4.4 Stormwater

Stormwater management for the marine precinct and surrounding lands will be considered during the detailed design phase. Consideration is being given to channelling all stormwater culverts through one discharge point into the Ross River. Consideration is also being given to the interaction of stormwater management options with the TPAR.

Stormwater runoff will need to be managed in accordance with best practice water sensitive urban design to ensure adverse impacts to receiving waters are avoided and minimised. Stormwater discharges must be designed to avoid local flooding impacts.

I note that POTL has commenced discussions with TCC in relation to stormwater outlets and the desired solution for discharge of stormwater to Ross River. POTL has also committed to liaise with TCC so that any potential future Council upgrades to its stormwater outflow down Archer Street can be taken into account in the design of stormwater outlets to Ross River; and provide TCC a stormwater management plan to support the final design.

I have imposed conditions (Appendix 1, Schedule C, Condition 6 b) to ensure that a stormwater management plan will be finalised as part of the EMP for the project.

5.5 Environmental management of site

5.5.1 Air emissions

5.5.1.1 Context

When considering the predominant easterly wind directions, the project site is located on the 'upwind' side of the port. The nearest sensitive receptors to the marine precinct are residential areas of South Townville located more than 350 metres away.

There is potential for air emissions from on-site operations to have impacts on the surrounding environment. Air emissions from potential operational activities within the marine precinct have been assessed in the EIS utilising appropriate quality modelling. Results indicate that the 'worst case' un-mitigated operational activities considered (abrasive blasting, fuel storage and emissions from moored vessels) would not have a significant impact on any nearby sensitive receivers. The EIS recommends that actual operations to be established on the site with potentially higher emissions than considered in the modelling would need to go through individual assessment on a case-by-case basis.

All businesses that subsequently take up residency in the marine precinct must obtain all relevant development approvals, as applicable, and must have an environmental management plan that is integrated with the port's overarching EMS.

The EIS also presented results of modelling of 'worst case' dust emissions and dispersion to give an indication of the likely impacts of earthworks and other construction activities on nearby sensitive receptors. The modelling shows that, for the assumed default and uncontrolled emissions, dust concentrations will likely exceed the criteria at adjacent residential areas. The EIS concludes that, provided appropriate management procedures included in the EMP are implemented, construction related dust emissions would be reduced to levels that would not significantly impact on the amenity of sensitive receivers. Recommended mitigation measures include, but are not limited to, watering of all exposed surfaces and sealing of access roads.

Several public submissions raised concerns about potential construction and dredging noise and lighting impacts from the project on the surrounding environment and local residential area. Specific concerns raised in submissions include:

- The air quality models used in the EIS over-predict the settling rate of dust and under-predict the atmospheric pollution plume that may potentially be generated from the marine precinct therefore airborne pollutants may travel much more than 500 metres (possibly several km) down-wind of the port.
- Queensland Health recommended that POTL be required to carry out proactive monitoring of particulate matter emissions to confirm the effectiveness of its mitigation measures and compliance with relevant Queensland health-based standard, including the 24 hour PM10 concentrations in the *Environmental Protection (Air) Policy 2008*.

As reported in the EIS, DERM maintains an air quality monitoring network of five sites in Townsville. Results from this monitoring, along with additional industry monitoring from the Townsville Port Authority and Sun Metals Corporation, are reported on monthly and annually basis. This reporting indicates that lead is not required to be monitored because "pollutant levels are reasonably expected to be consistently below the relevant [National Environmental Pollution Monitoring] standard".

5.5.1.2 Conclusions – air emissions

I am satisfied that the air quality modelling provides an adequate indication of worst case scenarios. In addition, **I am confident** that the appropriate control of construction dust and the regulation of ERAs within the project site would minimise risks of unacceptable levels of air emissions associated with the marine precinct affecting nearby areas.

The draft EMP includes requirements for dust monitoring during construction. **I have imposed** a condition (Appendix 1, Schedule C, Condition 6 e) that requires additional monitoring if activities on the site have potential to generate air emissions greater than those considered in the EIS.

5.5.2 Noise and vibration

The EIS identifies a range of potential noise and vibration sources from construction works and ongoing operational activities. These include pile driving, construction machinery and heavy vehicles. Cumulative noise impacts from the project in conjunction with the TPAR corridor were also considered.

Potential noise impacts on sensitive receptors, including the residential areas adjacent to the development, were assessed for both construction and operational phases of the project. This included monitoring activities at the sensitive receptors over a period when construction and port traffic movements were occurring.

In situ monitoring and modelling of data conducted for the EIS have demonstrated that construction related noise and vibration from the marine precinct will not significantly impact on the amenity of sensitive receivers provided appropriate management procedures are implemented. This includes adopting appropriate work hours for pile-driving and management of potential for sleep disturbance of trawler occupants during staged construction.

Noise impacts due to dredging for the project are not considered to be significant, as construction would require small dredging plant, due to draft (depth) restrictions, and maintenance dredging in the marina basin would use similar cutter-suction or backhoe plant to that currently used. The EIS notes that POTL has received only one public complaint about noise from dredging activities in the last seven years. This includes maintenance dredging of Ross River, which occurs approximately every two years including dredge operations adjacent to the project site in 2009.

Environmental impacts associated with noise on marine fauna are addressed in section 5.2.4 of this report.

Noise mitigation measures have been included in the EMP for the project. These include:

- specified working hours
- specified transport activity hours
- installation of noise silencers where appropriate
- removal and replacement of any equipment that is producing excessive levels of noise
- residents surrounding the port are to be notified of the construction timetable
- all complaints are to be taken into consideration and investigated accordingly.

Within the EMP for the project, POTL has committed to the following measures to address noise impacts:

- Log any received complaints regarding noise.
- Upon receipt of a noise complaint undertake monitoring within 3 to 5 working days.
- If exceedances are detected, the source should be investigated and equipment and operational procedures reviewed to identify means of reducing noise to acceptable levels.

These measures are included in the draft environmental management plan for the project, to be finalised before commencement of construction.

5.5.3 Lighting

Environmental impacts associated with lighting during construction and operation of the marine precinct relate mainly to disturbance to marine fauna (such as the disorientation of green and flatback turtle hatchlings), and local residential area. Lighting impacts to marine fauna are addressed in section 5.2.4 of this report.

Mitigation of potential lighting impacts on the surrounding environment and suburbs has been identified in the draft EMP.

Key measures include appropriate lighting design to ensure the site is not over-lit as well as restricting the potential light spill on surrounding environment through sensitive light placement and specification of lighting.

5.5.4 Hazard and risk

A detailed hazard and risk assessment conducted for the EIS identified the nature and scale of hazards that may occur during the design and construction, operation and decommissioning of the marine precinct. High risks include dredging impacts, strain on existing infrastructure, member/s of public entering the site intentionally to cause harm, increased traffic, disturbance of potential acid sulfate soils, vessel collision and tropical cyclone related hazards. Opportunities to manage these potential risks, and others identified, include development of a suitable dredging management plan, liaison with local government regarding infrastructure upgrade requirements, development of an acid sulfate soil management plan and an emergency management plan to deal with situations related to intruders, vessel collision and tropical cyclones.

The EIS finds that, based on the assessments conducted, there are no hazards which have offsite impacts. The controls identified for the marine precinct construction and operation are considered to adequately safeguard against any safety and environmental consequences from hazards associated with the marine precinct.

5.5.5 Health and safety

The EIS (section 3.16) identifies air quality and noise levels as the main community values for public health and safety that may be affected by the construction, operations and decommissioning of the marine precinct. The implementation of workplace health and safety procedures and the EMP management plans aims to minimise the potential risks to acceptable levels.

In a submission to the EIS, the Department of Community Safety queried whether design of the buildings and structures of the marine precinct would include acceptable fire safety systems. It was also suggested that the possibility of marine craft incidents should be assessed in further detail.

All infrastructure to be constructed as part of the marine precinct will be required to meet all applicable building codes and fire safety standards.

In a submission to the EIS, DTMR raised concerns that the preferred offshore breakwater configuration would affect vessel manoeuvrability and safety related to cross currents, back eddies, approach visibility and increased tidal flow. Matters relating to navigation safety of the proposed detached breakwater in are addressed in section 5.2.1 of this report.

6. Environmental management plan

Potential environmental issues requiring attention have been identified during the impact assessment process. The purpose of the EMP is to detail the actions, procedures and responsibilities to be carried out during the implementation of the project in order to mitigate adverse and enhance beneficial environmental and social impacts.

The objectives of the EMP are to provide:

- a practical framework for establishing best practice environmental management standards and guidelines to mitigate potential environmental harm for each activity
- a mechanism to assist managers, supervisors and construction crews to comply with current legislation
- a means of identifying environmental issues and to provide general procedures which must be considered when undertaking construction and operational activities
- a mechanism to reduce the potential impacts of construction and operational activity
- a preliminary basis for establishing environmental due diligence during the construction and operational phases.

The EMP establishes the framework, including environmental protection objectives, standards, measurable indicators and control strategies (i.e. to demonstrate how the objectives will be achieved), to ensure that the measures are implemented during each stage of the project.

This is also achieved by specifying the monitoring, reporting and auditing requirements, with nominated responsibilities and timing, to ensure that the commitments are met. The EMP also identifies corrective actions if monitoring indicates that the performance requirements have not been met.

A draft environmental management plan (EMP) has been prepared by POTL for the construction and operation of the project (EIS chapter 8). The draft EMP outlines commitments to protect the environmental values potentially affected by the construction and operation of the marine precinct.

The draft EIS (chapter 8.7) presented an EMP covering 15 ‘elements’ for the management of:

- marine water quality
- surface and ground water
- terrestrial flora and fauna
- marine and intertidal terrestrial flora and fauna
- storage and handling of hazardous substances
- waste management
- noise
- air quality
- environmental emergency procedures
- visual and amenity
- traffic and site access
- management and staff responsibilities
- staff environmental training
- cultural heritage
- greenhouse gas management.

I note that with regard to the cultural heritage element of the EMP, a draft Cultural Heritage Management Plan has been completed for the project site to fulfil the requirements of the *Aboriginal Cultural Heritage Act 2003*.

The EMP is structured as follows:

- relevant statutory obligations and regulatory framework within which the project will be required to progress
- management structure and general project responsibilities for staff involved in the project
- environmental management objectives for particular environmental aspects
- subsequent stages of the environmental management process during the detailed design, construction and operational stages of the project.

The structure of the EMP includes:

EMP Element Component	**Description of Content**
Element	The environmental aspect of construction or operation requiring management consideration. Includes potential impacts
Policy	The guiding operational policy that applies to the element. Includes performance objectives
Policy Implementation	The mechanisms and actions through which the policy will be achieved. Includes management actions for construction and operation, and responsibility (i.e. agent)
Performance Requirements	The criteria by which the success of the implementation of the policy will be determined. Includes performance indicators
Monitoring and Reporting	The process of measuring actual performance, or how well the policy has been achieved, including the format, timing and responsibility for reporting and auditing of the monitoring results.
Corrective Action	The action to be implemented and by whom in the case where a performance requirement is not met.

The construction contractor is responsible for preparation of a detailed construction phase EMP (EMP (Construction)), which must address the requirements set out in this draft EMP.

The EMP (Construction) will take into consideration the specific construction methods proposed, including capital dredging, and tailor appropriate mechanisms, monitoring and reporting requirements to these methods. For the purposes of this EMP, construction is taken to include all land and marine based construction activity, including dredging.

Operational phase environmental management will be addressed by POTL as part of the port's Environmental Management System (EMS). Operational requirements of the EMP will be incorporated into the EMS.

The EMP for the project is required to be finalised prior to commencement of works and must include all relevant approval conditions arising from the project's approval and subsequent permits, authorities and/or licences. **I have imposed** conditions (Appendix 1, Schedule C, Conditions 6-7) to ensure the draft EMP is carried forward for the construction phase and its operational elements are included within the port's EMS.

7. Matters of National Environmental Significance

7.1 Project assessment and approvals

The project was referred to the Commonwealth Minister for the Environment, Heritage and the Arts on 7 October 2008 to determine whether the project constituted a 'controlled action' with respect to potential impacts on matters of national environmental significance (MNES) under sections 75 and 87 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act).

On 3 November 2008, the project was determined to be a controlled action (reference number EPBC 2008/4497). The controlling provisions are:

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

As a result, the project requires assessment and approval under the *Environment Protection and Biodiversity Conservation Act 1999* before it can proceed. The state's EIS process is accredited under a bilateral agreement with the Commonwealth Government ensuring the EIS provides the necessary information for the Commonwealth Government to make its decision on the project.

The controlled action may be considered for approval under section 133 of the EPBC Act once the Commonwealth Minister has received the Coordinator-General's EIS evaluation report from the EIS process prepared under section 35 of the SDPWO Act.

This section of the report provides the state's evaluation of the potential impacts of the project on those MNES determined as controlling provisions under the EPBC Act.

Chapter 7 of the EIS address MNES, and support information is provided by POTL in an additional information report on MNES for the Townsville Marine Precinct project EIS (GHD report reference number 42/15399/00/399586, January 2010).

7.2 Potential impacts and mitigation measures

7.2.1 World Heritage properties

7.2.1.1 Context

The project's proposed marine structures and dredging activities will be located within the Great Barrier Reef World Heritage Area (GBRWHA) but are outside the Great Barrier Reef Marine Park (GBRMP).

The Great Barrier Reef, one of Australia's first World Heritage properties, was inscribed on the World Heritage List in 1981 in recognition of its outstanding natural universal values. The relevant World Heritage criteria are:

- to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance
- to be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features

- to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals
- to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

As the project site is within the GBRWHA, all of the above criteria for which the GBRWHA was listed are applicable to the assessment. However **I note** that the project area is a disturbed site immediately adjacent to the Townsville urban area and the Port of Townsville – the majority of which is built on reclaimed land. The proposed development is generally compatible with the existing industrial landscape is therefore not expected to impact on the natural beauty of the GBRWHA areas containing superlative natural phenomena.

7.2.1.2 Potential impacts

7.2.1.2.1 Geomorphic and physical coastal features

In addition to the previous reclamation works for the Port of Townsville, the entrance channel to the Ross River has been extensively modified by past dredging and material extraction activities. Despite these disturbances, a prominent sand spit has formed near the southern bank of the Ross River entrance. This feature has local significance, particularly as a roost site for shorebirds.

Coupled hydrodynamic, wave and sediment transport modelling was undertaken in order to describe the existing hydrodynamic characteristics of Cleveland Bay, and in order to assess potential impacts associated with the construction of the project and associated breakwater.

A range of hydrodynamic modelling scenarios was also investigated in order to provide an assessment of the combined impacts of tides, waves and winds and a 100 year average return interval flood event in the vicinity of the proposed marina and channel dredging works.

An analysis of coastal (geomorphic) processes affecting the site was also undertaken.

The key conclusions derived from the studies include:

- There is no significant impact on ambient water levels in Ross River as a result of the proposed project under the driving forces of tide and wave (both prevailing and 1 year storm wave) conditions.
- Current velocity magnitudes are expected to be slightly reduced at the proposed marine industry site while an increase in current speeds between the breakwaters is predicted. Under flood conditions, bed shear stresses could potentially increase by 5–8 N/m2 in the entrance and at the tail of the eastern breakwater. This imposes a risk of additional local scour, which will need to be monitored post-construction.
- The coastal processes in the vicinity of the project are influenced by the breakwater structures proposed in the EIS (option C) in a number of ways. However, the processes are capable of moving sandy sediments at only relatively slow rates due to the low wave climate and hence any changes will take time to develop and will be restricted to the local area. Therefore the EIS finds that it is unlikely that there will be any significant effects on coastal processes from the breakwater structures beyond the areas immediately adjacent to the breakwater. Significant erosion, disturbance or loss of the sand spit at the Ross River entrance is not expected.

It is noted that the detached breakwater investigated in the EIS is not proposed for construction in stage one of the project. A structure of that scale may be built as part of a later stage and would be subject to further detailed design investigation. The SIR describes a smaller structure that may potentially be included in the second stage of the project and suggests a minimal wave screen rather than a rubble mound breakwater structure.

The impacts associated with the breakwater structure, as presented in the EIS, represent the maximum impacts for any proposed breakwater, that is, a 'worst-case scenario'. Conditions imposed in this report (Appendix 1, Schedule C, Conditions 1-3) set out the performance requirements for any breakwater or wave screen structure that must be satisfied. These performance requirements are necessary to ensure

the environmental impacts associated with any offshore breakwater structure are no more than that considered in the EIS.

These include an investigation into impacts on the coastal (geomorphic) processes in the vicinity of the Ross River entrance.

7.2.1.2.2 Coastal and marine ecosystems

Direct, indirect, permanent and temporary impacts on the benthic marine systems within the GBRWHA are expected from construction and operation of the project. The majority of the impacts involve the removal of an area (approximately 34 hectares) of intertidal sand/mud flat on the western bank of the Ross River that forms Lot 773 and the loss of seabed (approximately 2 hectares) associated with the footprint of the breakwater.

7.2.1.2.2.1 Permanent loss of seabed

Potential and probable impacts associated with the reclamation on marine ecological values include removal of benthic organisms, reduced use of the area by marine fauna, and increased disturbance to marine habitats.

Investigations for the EIS indicate that the project area supports a range of intertidal and sub tidal soft sediment marine communities. Crabs, snails and worms were commonly found although overall species diversity and abundance were not more significant than adjacent areas. It is not considered to be a community or ecosystem of high value either in its own right or as a critical feeding ground for other, higher-order, species. Loss of this relatively small area of seabed is not expected to have a negative effect on the importance of the benthic marine habitats of the Townsville region. Nor it is anticipated to affect biodiversity of the region or affect the habitat utilisation patterns of marine megafauna within the area.

The permanent loss of seabed and the small area of marine plants (mangroves) is partly balanced by the creation of new rocky substrate habitat and sheltered/shaded waters in the constructed basin. **I note** the government's commitment to constructing recreational boating facilities in Ross River is considered an appropriate offset for the remaining impacts of the project on marine fish habitat.

7.2.1.2.2.2 Impacts on water quality

Temporary impacts expected as a result of construction activities include disturbance of sediments and underwater noise impacts.

Mitigation measures identified in the EIS include the use of dredge and waste management approaches to reduce potential for indirect impacts.

Potential impacts on water and sediment quality include stormwater run off, accidental spills of hydrocarbons and other products, and dust.

The potential impacts of construction and operation of the project on water quality are:

- generation and migration of turbid plumes from capital and maintenance dredging. The proposed dredging would be undertaken by a cutter suction dredge therefore seabed sediments may be disturbed by the action of the dredge head or sediments may be released with the tailwater discharged from the reclamation settlement pond.
- mobilisation of contaminants into the water column (including nutrients and acid sulfate soils) during capital and maintenance dredging
- discharge of contaminants from various marine industries into Ross River.

Results of turbidity and suspended solids monitoring indicate that the Ross River estuary and the area immediately offshore from the river mouth is a naturally turbid system (average 35 NTU) and that turbidity is fairly uniform through the water column. These conditions are associated with sediment re-suspension (caused by the action of wind-waves) in Cleveland Bay and runoff from the Ross River catchment during to high rainfall events.

Studies indicate that seagrasses in the vicinity of the Townsville port are likely adapted to the naturally occurring high turbidity for the area and also in response to existing levels of maintenance dredging and

shipping activities. These compounding influences on turbidity are, however, recognised to be short-lived to which the seagrass meadows have resilience.

The area to be dredged and reclaimed for the project is a shallow water environment which does not support seagrasses. The closest adjacent meadows are approximately 1 kilometre from the project site.

In addition, modelling undertaken for the project shows that the dredging plant to be used and the approach of direct reclamation reduces the potential for mobilisation of sediments or contaminants into the water column and, hence, reduces the potential for smothering effects to adjacent sensitive habitats.

The results of turbidity modelling outlined in this report suggest that it is unlikely that dredging will result in increases in turbidity significantly above background levels at the sensitive sites that are of ecological significance and that any increase is likely to be over one tidal cycle only.

Therefore, the project is not expected to impact upon seagrasses and hence not impact on the preferred feeding habitat of listed marine megafauna including the dugong.

7.2.1.2.2.3 Sediment quality

Overall, the quality of sediments in the project area is compliant to the National Assessment Guidelines for Dredging (NADG, 2009) and the Environment Investigation Levels (EIL) of the Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland (DERM, 1998). Therefore it is not expected that dredging would result in the release of contaminants to the water column.

Potential acid sulfate soils (PASS) were detected at over 70 percent of sites examined in the study area. The EIS notes that this would affect the ability to re-use some of the material targeted for dredging for reclamation and construction activities.

Given the extent of PASS identified in the EIS assessment and the proximity of the works to sensitive marine environments, the dredged material will require careful monitoring and management of potential impacts. This will be controlled by an acid sulfate soil management plan that is required as part of the overall construction environmental management plan.

7.2.1.2.2.4 Marine pests

The project area was assessed for the presence of marine pests as part of the survey of sub tidal and intertidal habitats. No marine pests of concern for the Townsville region were detected in any of the samples collected during this survey.

The proposed marine industry precinct is intended primarily to relocate existing industries from other locations in Townsville therefore no significant additional risk of marine pest incursion would be anticipated. The precinct will not be the first port of call for international vessels and, hence, will not act as an area for quarantine clearance of vessels. Consistent with the overall operation of the Port of Townsville, national and state biofouling and ballast water management guidelines and requirements for both domestic and international shipping traffic will be implemented.

7.2.1.3 Conclusions – World Heritage properties

I consider that the hydrodynamic modelling undertaken for the project demonstrates that water levels, flushing characteristics and sedimentary processes of the Ross River are not significantly altered by the construction and operation of the project, including the proposed breakwater option presented in the EIS (option C), and that that its impact on water quality of adjacent World Heritage coastal waters would also be acceptable.

I consider that the EIS and EMP (subject to finalisation and approval by relevant agencies) for the proposed project are satisfactory for the stage one construction of the marine precinct, including reclamation of Lot 773, and sufficient to avoid or minimise adverse impacts to the World Heritage values for which the GBRWHA is listed.

Any Commonwealth approval for the project would be based on the revised concept drawing provided in the SIR (specifically figure SK034—reproduced as figure 2 in this report), which includes all stages of the proposed marine precinct project. The overall extent (footprint) of the marine precinct is as presented in the EIS. The likely industries that will occupy subsequent stages of the marine precinct will be similar in scale and activity to stage one, and each will be subject to development assessment against the Port of Townsville Land Use Plan and all other statutory requirements.

The offshore breakwater structure, as presented in the EIS, represents the maximum impacts for any proposed breakwater, that is, a 'worst-case scenario'. Therefore, any offshore breakwater structure that is designed, built and operated to a smaller scale should result in less impact than the structure that was considered in the project EIS.

Approval for any breakwater structure requires that its design and construction must satisfy the performance requirements set out as conditions imposed in this report (Appendix 1, Schedule C, Conditions 1-3). These performance requirements are necessary to ensure its effects on hydrodynamics and sedimentation are no greater than that considered in the EIS.

State approval for the construction of any breakwater structure will be subject to further modelling of final design options to ensure that all relevant adverse impacts are identified and avoided or satisfactorily mitigated to the performance required by the conditions imposed in this report.

I conclude that the potential for significant impacts on the values for which the GBRWHA was listed is unlikely, and that the mitigation measures considered for the project are adequate to avoid or minimise potential adverse impacts to the World Heritage values to an acceptable level.

7.2.2 National heritage places

7.2.2.1 Context

The GBRWHA is a place of national heritage significance, within which the project area lies, and has been addressed in section 7.2.1 of this report.

7.2.2.2 Conclusions – national heritage places

I consider that the EIS and EMP (subject to finalisation and approval by relevant agencies) for the proposed project are sufficient to avoid or minimise adverse impacts to the national heritage values of the GBRWHA.

I conclude that the potential for significant impacts on the national heritage values of the GBRWHA is unlikely, and that the mitigation measures considered for the project are adequate to avoid or minimise potential adverse impacts to the national heritage values to an acceptable level.

7.2.3 Wetlands of international importance

7.2.3.1 Context

Townsville has one Ramsar-listed wetland—the lowland section of Bowling Green Bay National Park, between Alligator Creek and Cape Bowling Green, approximately 10 kilometres south-east of Townsville. Bowling Green Bay is also listed in the DEWHA Directory of Important Wetlands in Australia (Qld. Ref. No. BBN002QL).

A number of other wetlands, such as the Townsville Town Common to the north-west of the Port of Townsville, are considered locally important. The project is generally downstream of these and is not considered likely to have an impact.

Coastal wetlands immediately south of the Ross River are designated as being within an area of high ecological significance (HES) in the Draft Queensland Coastal Plan—Draft State Planning Policy Coastal Protection (2009), under the *Coastal Protection and Management Act 1995*, by virtue of their listing within the Directory of Important Wetlands.

7.2.3.2 Potential impacts

Studies in the EIS demonstrate the prevailing tidal and wind-driven water movements in Cleveland Bay and in the project area. Hydrodynamic modelling for the project indicates that movement of any suspended sediments generated by the construction or operation of the project would generally be in a north-westerly direction (i.e. past the port and toward The Strand), away from the Ramsar wetland and the wetlands south of the Ross River.

Furthermore, modelling indicates that the impact to coastal habitats north-west of the project area due to any sediment movement resulting from the project is negligible compared with the current prevailing pattern of sedimentation.

Findings from the coastal processes and ecological assessments conducted during the EIS further indicate no impacts to the Ramsar wetlands will occur as a result of the project.

7.2.3.3 Conclusions – wetlands of international importance

I consider that the Bowling Green Bay Ramsar wetland is sufficiently remote from the project site to be impacted, during construction and operation, by suspended sediments from the dredging or dewatering of the reclamation area.

I consider that the impact to coastal habitats north-west of the project area due to any suspended sediment movement resulting from the project would be negligible.

7.2.4 Listed threatened species and communities

7.2.4.1 Context

Commonwealth Recovery Plans has been developed for the following marine species identified as potentially occurring within the project area or adjacent waters:

- marine turtles
- humpback whale
- whale shark.

Recovery plans set out the research and management actions necessary to stop the decline, and support the recovery, of listed threatened species or threatened ecological communities.
The aim of a recovery plan is to maximise the long term survival in the wild of a threatened species or ecological community.

7.2.4.2 Listed threatened species

7.2.4.2.1 Birds

Five threatened terrestrial bird species listed as protected matters under the EPBC Act were identified as potentially occurring within the project area. These are (with EPBC status):

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

Habitat suitable for each of these species, with the exception of the star finch, was found within the study area. None of these species were identified during the field surveys conducted for the EIS.

The majority of the impacts would be associated with the removal of a small area (approximately 1.5 hectares) of low integrity marine vegetation adjacent to Benwell Road on Lot 773. The offshore breakwater option was selected to provide wave protection for the marine precinct and not disturb the habitat for migratory bird species located on the sand spit and mudflats of the eastern Ross River mouth. No removal of vegetation or disturbance of fauna habitats is proposed for the south-eastern bank of Ross River, much of which is now reserved for conservation purposes.

Therefore the project is expected to have very limited impacts on the ecological values of the listed threatened terrestrial bird species.

7.2.4.2.2 Marine turtles

The EIS, Appendix U (Marine Megafauna), section 3, table 1, identifies listed threatened marine megafauna potentially found within the project area. Five turtle species listed as protected matters under the EPBC Act were identified as potentially occurring within the project area. These are (with EPBC status):

- flatback turtles—*Natator depressus* (vulnerable)
- green turtles—*Chelonia mydas* (vulnerable)
- loggerhead turtles—*Caretta caretta* (endangered)
- olive ridley turtle—*Lepidochelys olivacea* (endangered)
- hawksbill turtle—*Eretmochelys imbricate* (vulnerable)
- leatherback turtle—*Dermochelys coriacea* (endangered).

Cleveland Bay is not recognised as a major nesting area for marine turtles along the Queensland coast, however low density nesting by flatback turtles and green turtles does occur in nearby locations including The Strand, Pallarenda and Magnetic Island.

No records of turtles nesting on Lot 773 or coming close to the Ross River en-route to nesting beaches have been made. Although no nesting or evidence of nesting turtles has been reported on the western side of Cape Cleveland it is conceivable that turtles may utilise sandy beaches near the mouth of Ross River.

The EIS identifies that, in a regional context, Halifax, Cleveland and Bowling Green Bays are all important feeding sites where green turtles graze on the seagrass beds and flatback and loggerhead turtles forage for invertebrates.

Megafauna sightings during boat and aerial investigations for the EIS confirmed the importance of Cleveland Bay for turtles. This survey data also demonstrates the lack of turtle visitation to the project area, and that there are no consistent migratory/habitat usage pathways evident for these species within the project area.

Migratory pathways occur considerable distances from the project area within the wider Cleveland Bay area and are not expected to be impacted by the project.

The EIS identifies a range of potential and probable direct and indirect impacts to marine turtles. A range of potential mitigation measures is also identified, including use of fauna spotters and equipment soft-starts to minimise potential impacts to marine megafauna, adoption of lighting appropriate to minimising impact upon marine fauna, and avoiding marine habitats used frequently by marine fauna during dredging, spoil disposal and construction.

Excessive construction or operational lighting would have the potential to disorient nesting or hatching turtles in the vicinity of the project. The EIS provides a number of mitigation strategies to reduce the risk of light spill into marine environment. These commitments have been specified in conditions (Appendix 1, Schedule C, Condition 6) set out in this report.

7.2.4.2.3 Reptiles

The yakka skink (*Egernia rugosa*—vulnerable) has not been recorded in the project area previously and the habitat on the project site is considered to be unlikely to offer high quality habitat for this species. It is considered highly unlikely that this species will be impacted by this project.

7.2.4.2.4 Terrestrial mammals

Two threatened terrestrial mammal species are identified as potentially occurring within the study area. These are the spectacled flying fox (*Pteropus conspicillatus*—vulnerable) and the false water rat (*Xeromys myoides*—vulnerable). Neither species was observed during field surveys.

Although the project site does contain several fruiting trees (mangroves) it is unlikely to serve as an important food source for the spectacled flying fox and it is considered highly unlikely that this project will impact on this species.

Suitable intertidal habitat for the false water rat is present in the project areas. The project proposal will mostly impact on the western edge of the foreshore, with some degraded mangrove areas to be cleared. However, permanent removal of habitat for this species will be minimal (< 1.5 hectares), and, if it is present, impacts are unlikely to be significant. This location is already subject to human disturbance hence the actual occurrence of the false water rat is unlikely.

7.2.4.2.5 Marine mammals

Humpback whales (*Megaptera novaengliae*—vulnerable) generally occur in offshore areas and are observed off Magnetic Island. Given the inshore location of the project and the shallow waters of the area (< 10 metres) it is unlikely that the project will have any effect on this species.

Potential impacts on dugongs and dolphins are addressed in section 6.2.4 of this report.

7.2.4.2.6 Sharks

The whale shark (*Rhincodon typus*—vulnerable) has been identified as potentially occurring within or adjacent to the project site. No whale sharks have previously been recorded in the port limits and their presence is highly unlikely. The project is unlikely to affect this species as they are widespread, migratory and unlikely to venture into the project area.

7.2.4.3 Listed threatened ecological communities

No threatened ecological communities were detected within the footprint of the project area.

7.2.4.4 Conclusions – listed threatened species and communities

I consider that the project will not have significant impact on the feeding, nesting or migratory behaviours of the listed threatened species in the vicinity of the project area.

Based on the EIS, draft EMP and SIR, **I have imposed** conditions of development concerning marine flora and fauna (see section 5.2.4).

7.2.5 Listed migratory species

7.2.5.1 Migratory birds

The south-east bank of the Ross River, directly across the river from the project area, is used by marine wading and migratory birds, with over 1000 individual birds using this area during low tide.

Studies indicate this area is an important habitat for species protected under international conservation agreements between Australia and three countries (China, Japan and Republic of Korea) and protected under the Nature Conservation Act and EPBC Act.

Species of relevance found to be using the area include the lesser sandplover, eastern curlew, beach stone curlew, whimbrel, great knot, red-necked stint and little tern.

These species were not found to commonly occur on Lot 773 as it is a disturbed habitat, adjacent to an urban area and used for recreational activities including dog walking. The south-east bank area is not easily accessible by recreational users and provides adequate habitat to accommodate any shorebirds displaced by removal of Lot 773 habitat.

The EIS notes the trend of accretion of the sand bank and the potential for a higher rate of accretion caused by the 'wave shadow' effects of the detached breakwater. This should lead to a general enhancement of its habitat value for migratory birds.

7.2.5.1.1 EIS submissions

Concerns were raised by a public submission to the EIS regarding threats to shorebirds feeding and roosting habitat on the south-east bank of the Ross River, opposite the project area, due to increased ability to access this area by dog walkers and beach picnickers, and over-fishing of bait species.

Both the Wading and Migratory Bird Report (EIS Appendix V) and EMP recognise the significance of the existing shorebird feeding and roosting habitat on the south-east bank of the Ross River opposite Lot 773.

The reports identified that by disconnecting the proposed breakwater from land, which is the design adopted under the EIS (option C), the risk of increased access to the roosting area by terrestrial predatory pest species or by increased visitation and hence disturbance of the birds by people, is avoided.

The breakwater design presented in the EIS was selected to avoid impacting the area utilised by migratory birds by avoiding removal of seabed or disturbance of marine habitats on the south-east bank area of the Ross River.

7.2.5.2 Conclusions – migratory birds

I am satisfied that the project site, on Lot 773, is not an important or critical habitat for the listed migratory bird species.

I am further satisfied that the final design of the offshore breakwater structure, and the construction and operation of the project, would not have an adverse effect on the listed migratory birds in the vicinity of the project area, in particular the shorebird feeding and roosting habitat on the south-east bank of the Ross River.

7.2.5.3 Migratory mammals

Boat-based and aerial marine megafauna survey findings over a seven month period from September 2008 to May 2009 (EIS Appendix U) identified the following listed migratory marine mammal species:

- dugong—*Dugong dugon*
- Indo–Pacific humpback dolphins—*Sousa chinensis*
- Australian snubfin dolphin—*Orcaella heinsohni*
- bottlenose dolphins—*Tursiops sp.*

The design of the field survey program was based on previous studies within the region and advice from local researchers experienced in similar work in Cleveland Bay.

During studies for the EIS none of the key marine fauna species surveyed were observed within the immediate footprint of the project area, although they were in close proximity (< two kilometres). The project area is not an area of high utilisation for marine migratory megafauna species. This was expected as the project area is a shallow tidal sand/mud flat that dries at low tide and does not support preferential feeding or breeding habitat.

The EIS reports that these key marine fauna species have a higher presence in areas of more suitable habitat, i.e. in deeper water near the port and, for dugongs in particular, seagrass meadows at the southern section of Cleveland Bay. The likelihood of animals transiting between high usage habitat areas was considered in the supplementary information report to the EIS. Based on all available information no distinct transit pathways or migratory pathways for marine megafauna have been discernable either within the vicinity of the project area or the wider Cleveland Bay area.

7.2.5.3.1 EIS submissions

Concerns were raised by EIS submissions relating to potential marine megafauna impacts. These included:

- direct (reclamation) and indirect (increased sedimentation/disturbance) loss of marine megafauna migratory, feeding habitat, including snubfin and Indo–Pacific humpback dolphin habitats in Cleveland Bay
- impacts on marine faunal habitats and usage of habitats resulting from hydrological change in both the Ross River mouth and inshore estuarine area as a result of the development
- increased potential for boat strike of megafauna resulting from increased vessel traffic.

In response to the EIS submissions, a supplementary information report was provided by POTL to address the issues raised.

Fauna are expected to temporarily vacate the surrounding habitats during dredging and reclamation works, therefore trapping and fatalities are unlikely. Furthermore, Lot 773 is an intertidal plot. So if construction occurs during the higher tidal range (wet), species will have opportunity to move out of the area or swim away from the stationary dredger. If construction occurs during the lower tidal range (dry), the mouth of the bund can be closed at low tide after fauna have vacated the area to prevent re-entry.

Maintenance dredging will be required on a schedule and scale similar to that which currently exists to maintain the existing Ross River channel. To date, no adverse impacts of these operations on marine megafauna have been reported.

Sedimentation predicted from the hydrodynamic modelling, and potential for sediment deposition as a consequence of the development on critical marine megafauna habitat, including seagrass meadows and algal assemblages in Cleveland Bay, was considered under the megafauna risk assessment process.

Potential sensitive habitat loss is not considered likely due to sedimentation and, hence, is not considered to be a risk or threat to megafauna from construction or operation of the project.

7.2.5.3.2 Underwater construction noise

A review of underwater noise impacts studies, in relation to in-water construction works completed by for other shallow marine dredging and reclamation works projects (e.g. Gladstone Western Basin Dredging and Disposal), are of direct relevance to the marine precinct project. That review examined the acoustic intensity and frequency of noise sources relative to the known sensitivity ranges for marine mammals. The study indicated that of all potential noise generating activities pile driving was most likely to have an impact.

Physiological impacts on marine mammals arising from underwater construction noise were assumed to be insignificant as the noise would be detected by the animals well before the animals would reach the distance from the source established as the 'impact zone' (< five metres). Precautionary mitigation measures, including soft-start pile driving, use of spotters, no pile driving if megafauna are within 5 metres, and use of warning noises prior to pile driving, are to be included in the finalised EMP for the project.

7.2.5.3.3 Potential boat strike impacts

The risk assessment for marine ecological values undertaken for the EIS (EIS section 3.10 and table 3.55) identifies the potential for boat strike impacts on marine megafauna although it is noted that no major problems have been observed to date.

Vessel traffic likely to be housed within the marine precinct currently utilises the Ross River from upstream industry areas. It is mostly slow moving commercial vessel traffic, travelling in a designated channel in Ross River. Other than normal growth expected with the growth of Townsville's economic activity, commercial vessel traffic associated with the marine precinct is not expected to increase in volume from that currently accessing upstream industry areas.

The SIR presents additional mitigation measures, adopting a precautionary approach, to decrease the potential for impacts on megafauna. Benefits may also result from the likely extension of the boat speed restrictions, which currently exist in the Ross River, to the navigation channel in the vicinity of the marine precinct (as advised by the Regional Harbour Master).

As a result of general public demand for recreational boating facilities in Townsville, in January 2010 the Queensland State Minister for Main Roads, announced funding for a project, independent of the marine precinct project, to provide 14 new boat ramp lanes for the recreational fishing and boating community in the Ross River.

This may result in an increase in recreational boat traffic in the Ross River, however this initiative, and any subsequent cumulative impacts that may result, would require a separate assessment and approval process against the provisions of the *Sustainable Planning Act 2009*.

7.2.5.3.4 Dugongs

Cleveland Bay is a dugong protection area declared under the *Fisheries Act 1994* and dugongs are relatively abundant, although they are not known to frequent areas close to the Port of Townsville.

The EIS (Appendix U) found that dugongs were found in areas with greater concentration of seagrass in Cleveland Bay. They were reported to be most frequent along the south-west shore of Magnetic Island and the eastern and south-eastern shores of Cleveland Bay near Cape Cleveland.

The EIS found that seagrass distribution in the bay is broadly similar between seasons and covers the majority of port limits. This suggests that given the dependence of dugong and green turtles on seagrass as a food resource, their presence in Cleveland Bay would remain relatively unchanged throughout the year.

Furthermore, there is no seagrass present within the direct project area, hence any impacts to adjacent seagrasses would be indirectly due to construction and operation (e.g. maintenance dredging) and likely to be minor in relation to the overall extent of dugong seagrass habitat in Cleveland Bay.

Dugongs are known to be vulnerable to injury or mortality from collisions with fast moving boats. As an example, the Moreton Bay Marine Park has introduced a number of 'go slow' management areas to reduce the incidence of collisions with dugongs and turtles.

The project is not expected to significantly increase the risk of boat strike injury to dugongs given that the proposed marine precinct facility is primarily designed to relocate existing industrial users from the existing Ross River industry precinct and therefore does not fundamentally change the levels of commercial boat traffic in the vicinity of the port.

In addition, dugongs do not frequently occur within the environs of the port.

There may be an increase in recreational boat traffic entering and exiting Ross River associated with new boat ramp facilities. These vessels are likely to be subject to boat speed limits while in the entrance channel adjacent to the proposed marine precinct.

7.2.5.3.5 Dolphins

The EIS reported that the Australian snubfin dolphin (*Orcaella heinsohni*) and the Indo–Pacific humpback dolphin (*Sousa chinensis*) are highly mobile and move in and out of Cleveland Bay.

Snubfin dolphins were observed to concentrate their activity around two areas, north-west of Cape Pallarenda, and south around Townsville's Port and Ross River mouth.

Humpback dolphins show a similar distribution, concentrating their activities mainly around the dredged channels and breakwaters close to the Port of Townsville, without a clear seasonal pattern.

Dolphins are highly mobile species and not as vulnerable to boat strike injuries as dugongs although, relative to their population size, are more likely to be present in the vicinity of the port environs. Given the levels of boat traffic already in the port environs and no reported incidences of collision related injuries to dolphins it is unlikely that an increase in traffic would significantly increase the risk. Any increase in boat traffic would not be directly associated with the proposed marine precinct but may be generated by expanded boat ramp facilities in Ross River.

7.2.5.4 Migratory reptiles

Occasional sightings of estuarine crocodiles (*Crocodylus porosus*) occur in Cleveland Bay. Suitable habitat for this species is present within the mouth of the Ross River and along the adjacent foreshore. Given the highly mobile nature of the species, the very small area of habitat to be affected, the disturbed/urban nature of the site and ongoing presence of marine vessel traffic, the project is considered unlikely to affect this species.

A sea snake was observed at the mouth of the Ross River. Sea snakes are listed as other protected matter species in the EPBC Act. Given the highly mobile nature of sea snakes, and the very small area of habitat to be affected, it is considered that there is a negligible risk that sea snakes will be affected by the project.

7.2.5.5 Conclusions – migratory mammals and reptiles

I consider that the construction of the project is not expected to have a significant impact on the key marine mammals and reptile species, either in terms of direct disturbance to important habitat, construction noise, or disruption of transit routes between patches of preferred habitat.

Based on the EIS, draft EMP and SIR, **I have imposed** conditions of development concerning marine flora and fauna (see section 5.2.4).

The operation of the marine precinct would reduce the volume of traffic, however, the project would not generate significant increases in commercial vessel traffic at the Ross River mouth as the marine precinct caters primarily for the relocation of marine industry business presently upstream in Ross River) and cause an increased potential for boat strike impacts.

I note the Queensland Government initiative to provide new public boating recreational facilities in Ross River that addresses a significant local public concern, including a number of submissions to the EIS. The demand for new boating facilities is independent of, and not a consequence of, the outcomes of the Townsville marine precinct project.

The assessment and approval of new public recreational boating infrastructure in the Ross River would be subject to a separate assessment and approval process and is outside the scope of my evaluation.

Therefore **I conclude** that the marine precinct proposal does not pose a significant risk to populations of dugongs, dolphins and other marine megafauna such as turtles in the project area or wider Cleveland Bay area.

7.2.6 Potential environmental offsets for MNES

7.2.6.1 Context

The draft Commonwealth policy statement "*Use of environmental offsets under the Environment Protection and Biodiversity Conservation Act 1999*" provides guidance on projects that may trigger consideration of an offset by the Commonwealth Government. The policy states:

"Environmental offsets are not applicable to all approvals under the EPBC Act. Each approval must be assessed on a case-by-case basis and must take into account the scale and intensity of impact from the development on the site and the potential for conservation outcomes through offsets. They should not be applied when the impacts from the development are considered to be minor in nature or could reasonably be mitigated."

Based on the findings of the EIS, **I consider** the proposed project has largely avoided or mitigated all potential impacts on matters of national environmental significance relating to the project area. However **I note** the Commonwealth Government may require an offset for the residual impacts, including the net loss of benthic habitat within the reclamation area.

As part of the EIS, POTL investigated and calculated a series of offset opportunities in the local area for loss of marine fish habitat associated with the project, and having regard to existing approved land uses. These potential offsets are discussed in section 2.5.4 of the supplementary information report (SIR) and included as Appendix D of the SIR.

In 2009, POTL transferred 200 hectares of port land for incorporation into an Environmental Reserve associated with the new Townsville Port Access Road (TPAR). On the basis that the transfer was far in excess of any contribution required for the TPAR project and given that the need for the marine precinct is linked to the TPAR, POTL considers that a portion of the transferred land should be available to be considered as an offset for the 24.2 hectares of net habitat loss associated with the Townsville marine precinct project.

I acknowledge the land transfer made by POTL of port land to Environmental Reserve but consider this as the contribution made by POTL to the resolution of approval and offset requirements for the Townsville Port Access Road development.

In addition to the previous compensatory actions, POTL has committed in the project EMP to additional monitoring of seagrasses and marine megafauna (EIS section 8.7.4.5). These commitments include continuation of a seagrass monitoring program and the marine megafauna monitoring work undertaken for the EIS.

To confirm POTL's commitments **I have imposed** conditions concerning seagrass and marine megafauna monitoring in Cleveland Bay (Appendix 1, Schedule C, Condition 8). In addition **I require** the proponent to undertake an assessment of noise related impacts on marine megafauna during the

stage one construction works (Appendix 1, Schedule C, Condition 9). This would provide a basis for improved practices during the project's construction and would add to the body of knowledge generally.

These commitments form the basis of POTL's megafauna management plan, to be included in the EMP for the project. The studies include (but are not limited to) the following:

- Continue annual long term seagrass monitoring surveys of seagrass distribution and abundance in the Port of Townsville. Appendix C of the MNES Report for the Townsville Marine Precinct project EIS (GHD, January 2010) includes a long term seagrass monitoring report, and a long term seagrass monitoring proposal for the Port of Townsville that provide detail to the seagrass monitoring component.
- Undertake ongoing marine megafauna monitoring during the first stage of the marine precinct construction to assess marine megafauna inhabitation of Cleveland Bay. The extent, methods and timing of monitoring should be similar to the programs undertaken for the EIS.
- Monitor underwater noise impulse (e.g. pile driving, construction dredging, bund wall construction) during the first stage of the marine precinct construction and conduct research on the effects of noise on marine megafauna.

7.2.6.2 Conclusions – potential environmental offsets for MNES

I consider that the marine megafauna management plan would additionally mitigate and/or offset potential impacts on matters of national environmental significance relating to the project.

8. Conclusion

Having regard to the documentation provided during the EIS process for the Townsville Marine Precinct project, **I am satisfied** that the requirements of the Queensland Government for impact assessment in accordance with the provisions of part 4 of the SDPWO Act have been met.

The EIS process has provided sufficient information to the state government and the community to allow evaluation of potential environmental impacts that could be attributed to the project.

I am satisfied that careful management of the key construction and operational activities, and adoption of the redesign criteria for any proposed additional works, including any offshore breakwater structure, I have recommended, should ensure that potential environmental impacts will be minimised or avoided.

POTL has made project commitments throughout the EIS and, during the subsequent review of the EIS, has made additional commitments in response to issues raised. These commitments have been included in the imposed conditions for the project (Appendix 1, Schedule C)

Furthermore, POTL has developed an EMP (which will be progressed further to detailed planning and design) to address specific environmental issues identified during the EIS process associated with the construction and operation of project. POTL has committed to finalising the project EMP in consultation with other relevant agencies.

In reaching a conclusion on the acceptability or otherwise of the management of potential impacts of the project, **I have considered** these project commitments and the EMP.

Where necessary, **I have set conditions** and made recommendations that POTL and other relevant entities are to implement.

On the basis of the information provided, including that from advisory agencies, **I am satisfied** that the adverse environmental impacts associated with the project are able to be addressed through:

- implementation of recommended conditions listed in Appendix 1 Schedule A of this report, as conditions for aspects of the project that are subject to a development approval under the SPA for operational works within the Port of Townsville Strategic Port Land
- obtaining a development approval and registration certificate from DERM under the EP Act for ERAs, based on draft conditions listed in Appendix 1 Schedule B of this report
- implementation of conditions listed in Appendix 1 Schedule C of this report, as imposed conditions for aspects of the project that are not within the Port of Townsville Strategic Port land including finalisation and implementation of the project EMP.

I consider that, on balance, the proposed marine precinct would provide improved facilities for those marine industries relocating from the upstream reaches of the Ross River and new businesses aiming to establish in the precinct. The proposed marine precinct would enable the consolidation and orderly future development of maritime industries and services in the Port of Townsville. Overall, there is a significant economic and environmental benefit for the Townsville and North Queensland regions to be derived from the project.

Therefore, **I recommend** that the Townsville Marine Precinct project, as described in detail in the EIS and summarised in section 2 of this report, can proceed, subject to the conditions contained in Appendix A of this report and the project commitments made by POTL contained in Appendix B.

In the event of any inconsistencies between the EIS documents and the recommended requirements in this report, the recommended requirements in this report prevail.

POTL and its agents must implement the conditions and recommendations of this report and all commitments presented in the EIS, SIR and EMPs.

In accordance with section 17(2) of the SDPWO Regulation, a copy of this report will be provided to the Commonwealth Minister for the Environment, Heritage and the Arts to enable a decision to be made under part 9 of the EPBC Act.

Under the provisions of part 9 of the EPBC Act, the Commonwealth Minister may approve or refuse the taking of the proposed action. In approving a proposed action, the Commonwealth Minister may attach conditions to the approval if he is satisfied that the condition is necessary or convenient to protect a matter of national environmental significance, or to repair or mitigate damage to a matter of national environmental significance.

Copies of this report will be issued to:

- Port of Townsville Limited, in accordance with section 35(5)(a) of the SDPWO Act
- the Commonwealth Minister for the Environment, Heritage and the Arts to make an assessment of the controlled action for the purposes of the EPBC Act.

Copies of the report will be also issued to agencies responsible for implementation of conditions including:

- the Department of Environment and Resource Management
- the Department of Employment, Economic Development and Innovation
- the Department of Transport and Main Roads
- the Townsville City Council.

Other advisory agencies who participated in the EIS process will be notified about the availability of this report.

In accordance with section 35(5)(b) of the SDPWO Act, a copy of this report will also be made available to the public on the DIP significant projects web site at:

www.dip.qld.gov.au/projects/transport/harbours-and-ports/townsville-marine-precinct.html

9. Acronyms and abbreviations

The following acronyms and abbreviations have been used in this report:

AHD	Australian height datum
ARI	average return interval
ASS	acid sulfate soils
CAMBA	China–Australia Migratory Birds Agreement
CCA	chromated copper arsenate
CG	The Coordinator-General of the State of Queensland
CHMP	Cultural Heritage Management Plan (under the *Aboriginal Cultural Heritage Act 2003*)
DEEDI	Department of Employment, Economic Development and Innovation
DERM	Department of Environment and Resource Management
DEWHA	(Commonwealth) Department of the Environment, Water, Heritage and the Arts
DIP	Department of Infrastructure and Planning
DTMR	Department of Transport and Main Roads
EIA	environmental impact assessment
EIL	environmental investigation levels
EIS	environmental impact statement
EMP	environmental management plan
EMS	Environmental Management System
ERA	Environmentally Relevant Activity
EP Act	*Environment Protection 1994*
EPBC Act	*Environment Protection and Biodiversity Conversation Act 1999* (Cwth)
EPP	Environmental Protection Policy
EP Reg	*Environmental Protection Regulation 1998*
GBRMP	Great Barrier Reef Marine Park
GBRWHA	Great Barrier Reef World Heritage Area
HAT	highest astronomical tide
IAS	initial advice statement
IDAS	Integrated Development Assessment System (of the *Sustainable Planning Act 2009*)
JAMBA	Japan–Australia Migratory Birds Agreement
MNES	matters of national environmental significance
NAGD	National Assessment Guidelines for Dredging (DEWHA, 2009)
NC Act	*Nature Conservation Act 1994*
NTU	nephelometric turbidity unit
PASS	potential acid sulfate soils
POTL	Port of Townsville Limited (the proponent)
QASSMAC	Queensland Acid Sulfate Soil Management Advisory Committee
RHM	Regional Harbour Master
RIA	Road Impact Assessment
RMP	Road Management Plan
SDPWO Act	*State Development and Public Works Organisation Act 1971*
SIR	supplementary information report (GHD, January 2010)
SPA	*Sustainable Planning Act 2009*
SPL	strategic port land
SPP	State Planning Policy
SPR	*Sustainable Planning Regulation 2009*
TCC	Townsville City Council
TIA (1)	Traffic Impact Assessment
TIA (2)	*Transport Infrastructure Act 1994*
TMP (1)	Townsville Marine Precinct (the project)
TMP (2)	Traffic Management Plan
TOR	terms of reference
TPAR	Townsville Port Access Road
VM Act	*Vegetation Management Act 1999*

Appendix 1. Conditions

Schedule A – Coordinator-General's recommended conditions for the Townsville Marine Precinct project

Schedule B – Draft conditions for a development approval for environmentally relevant activities for the Townsville Marine Precinct project

Schedule C – Coordinator-General's imposed conditions for the Townsville Marine Precinct project

Schedule A – Coordinator-General's recommended conditions

Schedule A contains recommended conditions that would attach to a development permit for operational works issued under the *Sustainable Planning Act 2009* for the project. The conditions are taken to be draft concurrence agency conditions for:

- tidal works
- work within a coastal management district.

Agency Interest: Coastal – operational work that is tidal work

Condition 1 The works must be carried out in accordance with the Environmental Management Plan provided with the Environmental Impact Statement, or any subsequently endorsed amendments to that plan.

Condition 2 An appropriate dredge management plan, including detailed monitoring and weather conditions must be endorsed by the administering authority prior to the commencement of works.

Condition 3 The development must be constructed, installed and maintained:

(a) to maintain the local and regional drainage or hydrological systems
(b) to ensure that changes in water chemistry will not impact on ecological values on or off site
(c) to ensure that any changes in surface water hydrology do not impact on any natural wetlands, habitat values, rare and endangered species as listed under the *Nature Conservation Act 1992*.

Condition 4 The proponent must ensure that the construction of the works is carried out only by means of suitable plant and equipment and that measures are taken to minimise turbidity in tidal waters.

Condition 5 An ASS Management Plan tailored to the proposed management method(s) must be endorsed by the administering authority prior to the commencement of operational works.

Condition 6 Works must comply with 'Instructions for the Treatment and Management of Acid Sulfate Soils, 2001, Queensland Government Environmental Protection Agency', or any updates of them as they become available, hereafter referred to as the ASS Instructions.

Condition 7 ASS must be managed to ensure that contaminants are neither directly nor indirectly released from the works to any waters unless otherwise authorised under a condition of this approval.

Condition 8 A water quality monitoring program incorporating response thresholds for all waters must be implemented to identify and monitor changes in the receiving environment.

Condition 9 Methods of water quality sampling must comply with that set out in the latest edition of the Department of Environment and Resource Management's Water Quality Sampling Manual.

Condition 10 All monitoring results required by this approval must be submitted in the specified format to the administering authority when requested.

Condition 11 No contaminants may be released from the site to any waters or the bed and banks of any waters (including groundwater) unless otherwise authorised.

Condition 12 Sediment management must avoid their release to waters or build up in any stormwater drain.

Condition 13 Complaint response
The operator of the ERA must record the following details for all complaints received and provide this information to the administering authority on request:
a) time, date, name and contact details of the complainant
b) reasons for the complaint
c) any investigations undertaken
d) conclusions formed
e) any actions taken.

Agency Interest: Coastal - Tidal work in, on, or above tidal waters

Condition 14 All rock, stone, gravel, sand or other material used in the construction of the revetment walls and breakwaters must be:

(a) suitable for the purpose having regard to the location of the site and its proposed use
(b) free from contaminants.

Condition 15 All treated timber (creosote and/or CCA) used in or adjacent to tidal land or waters must comply with Australian Standard 1604.1-2000.

Condition 16 All timber treated with creosote and/or CCA, including any double treated timber piles must be washed of all excess preservative prior to its use. Contaminated wash waters must not be deposited into tidal waters or cause contamination to land. All treated timber must be sawn or drilled over a catchment sheet or other surface suitable to catch waste materials and the waste materials must be disposed of in a licensed waste facility.

Condition 17 Any material that is deposited outside the alignment of the works area, or any debris that falls or is deposited on tidal lands or in tidal waters during the construction of the works must be removed by the proponent at its cost prior to the practical completion of the works.

Condition 18 Stormwater drainage systems must be designed and constructed to include water quality improvement devices (e.g. sediment removal, gross pollutant traps) to ensure that stormwater can be effectively managed, used or discharged without causing adverse impacts on the wetlands adjoining the subject land.

Condition 19 Any stormwater outlet from the site must be constructed and maintained to prevent or minimise localised erosion, or scouring and any erosion or scouring that occurs must be rectified as soon as reasonably practicable after its occurrence.

Condition 20 All temporary works associated with the construction of the project are to be removed from the site prior to completion of the works and all wastes must be disposed of at a licensed waste facility.

Condition 21 All reasonable and practicable measures must be taken to prevent pollution as a result of silt run-off, oil and grease spills from machinery, concrete truck washout and the like. Concrete agitator wash out must be conducted only in a specified area to facilitate the removal of waste concrete from the area to landfill.
Wastewater from cleaning equipment must not be discharged directly or indirectly to any watercourses or stormwater system.

Condition 22 Any erosion or loss of sand that occurs because of the works must be rectified.

Agency Interest: Coastal - Reclaiming land under tidal water

Condition 23 The reclamation is limited to the boundaries of the site described as Lot 773 on Plan EP2211 in the County of Elphinstone, Parish of Coonambelah.

Condition 24 All rock, stone, gravel, sand or other material used in the reclamation must be suitable for the purpose having regard to the location of the subject land and to the proposed use of the land after reclamation.

Condition 25 All rock, stone, gravel, sand or other material that has slipped or been deposited outside the reclamation area and that is causing an obstruction in a waterway must be removed from the waterway.

Condition 26 Details of the source, quantity and type of material to be used in the reclamation must be submitted to the administering authority.

Condition 27 The reclamation of the subject land must be completed within ten (10) years of the date of this approval.

Condition 28 The finished level of the proposed subject reclamation land should be specified to be RL4.15m (i.e. 2 m above the HAT) on Australian height datum, unless a detailed risk analysis indicates otherwise, to render it fit for the purpose of the reclamation.

Advice

The assessment manager will require reports from a registered professional engineer of Queensland to be submitted within three (3) months of the date of completion of the works, certifying that the works (including any other associated works) have been constructed in accordance with the approved drawings and conditions and

- are structurally adequate for anticipated usage
- comply with all relevant codes
- the bed and banks of the waterway for a distance of 15 metres around the site of the works are clear of all debris.

END OF COORDINATOR-GENERAL'S RECOMMENDED CONDITIONS SCHEDULE A

Schedule B – Draft conditions for environmentally relevant activities

Schedule B contains recommended conditions that would attach to a development permit for an environmentally relevant activity issued under the *Sustainable Planning Act 2009* for the dredging components of the project.

The conditions are taken to be draft concurrence agency conditions for:

- ERA 16 'extractive and screening activities' consisting of dredging a total of 1000 tonnes or more of material from the bed of naturally occurring surface waters in a year.

Condition 1: This approval is granted for the environmentally relevant activity of dredging for the purpose of construction and maintenance of lawful structures associated with the Townsville marine precinct project.

Condition 2: The Port of Townsville Limited must maintain direction of any operator carrying out an activity authorised by this permit.

Condition 3: A person conducting dredging authorised under this permit must not cause serious or material environmental harm to occur outside the footprint of the lawful structures.

Condition 4: Management System:
Any dredging conducted under this approval must comply with a Site Based Management Plan (SBMP).

Condition 5: The SBMP must include:
(a) An Ecological Health Monitoring Program (EHMP) as described under the Healthy Waterways Estuarine/Marine EHMP methods or equivalent.
(b) Specify events when dredging operations must be varied or ceased to prevent an adverse impact on the environment or ecosystem health, and the actions required to be taken.
(c) A plan for the lawful disposal of the dredged material.

Note: The SBMP may be a part of another management system that applies to the activity or the business of the port authority generally.

Condition 6: The SBMP must achieve the following outcomes:
(a) Material intended to be dredged under this permit is tested and analysed in accordance with the National Assessment Guidelines for Dredging 2009 as updated from time to time.
(b) Significant and sensitive receptors (including for example wetland and ecosystem features) in the port area are identified and mapped.
(c) Risks to environmental values are identified and managed.
(d) Control measures for operations to minimise likelihood of environmental harm are in place.
(e) The impacts of dredging operations are monitored through the EHMP as approved
(f) Contingency plans and emergency procedures are in place.
(g) Organisational structure and responsibility is recorded.
(h) Effective communication both internally and with the administering authority and other stakeholders.
(i) Staff are trained and aware of their responsibilities.
(j) Appropriate records are kept.
(k) Environmental performance is reviewed periodically and continual improvement measures applied accordingly.

(l) Data collected under the SBMP, including the results of testing and monitoring, must be submitted to the administering authority when any of the following occurs:
  (i.) A test indicates the presence of a contaminant under the National Assessment Guidelines for Dredging 2009 as updated from time to time
  (ii.) An EHMP event occurs
  (iii.) With the annual return.

Condition 7: Equipment

Any dredging conducted under this approval must use equipment that is equal to or better than the following equipment (the minimum technical standard).

(a) Trailing Suction Hopper Dredge – minimum technical specification
  (i.) Below keel discharge of tailwaters via an anti-turbidity control valve.
  (ii.) Vessel must have on-board systems for determining solids to water ratio or density of dredged material.
  (iii.) Vessel must have electronic positioning system for defining the location and depth of dredging activities. Dredge heads must be capable of, and have fitted, fauna exclusion devices (e.g. turtle deflectors).
  (iv.) Vessel must be registered and in survey with the International Maritime Organisation (IMO).

(b) Cutter Suction Dredge – minimum technical specification
  (i.) Vessel must have electronic positioning system for defining the location and depth of dredging activities. Vessel must have a continuous connection (e.g. floating or submerged pipeline) to an approved placement site.
  (ii.) Vessels must have a system or process to ensure the delivery system integrity is maintained at all times.
  (iii.) Vessel must have systems for determining solids water ratio or density of dredged material during operations. Vessel must be registered and in survey with the International Maritime Organisation (IMO).

(c) Grab Dredge – minimum technical specification
  (i.) Vessel must have electronic positioning system for defining the location and depth of dredging activities.
  (ii.) Vessel must be registered and in survey with the International Maritime Organisation (IMO).

Condition 8: Maintenance of Measures, Plant and Equipment

The registered operator of the ERA to which this development approval relates must:

(a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this approval
(b) maintain such measures, plant and equipment in a proper and efficient condition
(c) operate such measures, plant and equipment in a proper and efficient manner.

Condition 9: The operator must maintain a record of sites where dredging is carried out and the volumes of material removed, and submit them to the Port of Townsville Limited on completion of each dredging program authorised under this approval.

Condition 10: The Port of Townsville Limited must keep the records provided to it under condition 9 and attach them to the annual return or deliver them to the administering authority upon request from the administering authority.

Condition 11: Disposal of Dredge Spoil

Dredging must not commence until provision has been made to lawfully place or dispose of the dredge material.

Condition 12: Material dredged under this approval must not be placed at sea except at a disposal site lawfully authorised under an authority, licence or other permit issued by either, or both, the Commonwealth or Queensland government to receive material dredged from the construction of the structures.

Condition 13: Material dredged under this approval must not be placed on land:
(a) except in accordance with the requirements of the State Planning Policy for Planning and Managing Development Involving Acid Sulfate Soils and the associated guideline
(b) if the placement would result in the concentration of contaminants in the soils exceeding the Health Investigation Levels (HILs) for Exposure Setting A (Standard settings), provided in Table 5-A "Soil Investigation Levels (mg/kg)' of Schedule B(1) of the National Environmental Protection (Assessment of Site Contamination) Measure 1999.

Condition 14: Material dredged under this approval must not be placed on land, except in a containment area (the containment area) that:
(a) is structurally sound
(b) is designed for the purpose of preventing emissions from the containment area that may cause environmental harm
(c) has been certified as fit for purpose by a registered professional engineer of Queensland
(d) is maintained to the condition certified in (c).

Condition 15: A person placing material dredged under this approval into the containment area must not cause or allow structural or functional failure of the containment area.

Condition 16: Any direct or indirect discharge, including water and anything in water, from the containment area must not cause any or all of the following:
(a) environmental harm
(b) adverse impacts on water quality objectives that apply to the area surrounding the containment site
(c) sediment build up or erosion of any land including the bed of any receiving waters.

Condition 17: Any incident of environmental harm (including a reasonable suspicion that environmental harm has or is likely to have occurred) outside the footprint of the lawful structure must be reported as soon as practicable to the administering authority via the 24 hour hotline (1300 130 372).

Condition 18: Dredging activities must not cause damage to banks or other natural coastal features.

Condition 19: The release of airborne contaminants from the activity must not cause environmental nuisance.

Condition 20: Noise from the activity must not cause environmental nuisance.

Condition 21: All dredging plant personnel must be made aware of the conditions of this approval.

Condition 22: Complaint Response
The operator of the ERA must record the following details for all complaints received and provide this information to the Port of Townsville Limited and/or the administering authority on request:
(a) time, date, name and contact details of the complainant
(b) reasons for the complaint
(c) any investigations undertaken
(d) conclusions formed
(e) any actions taken.

END OF COORDINATOR-GENERAL'S RECOMMENDED CONDITIONS SCHEDULE B

Schedule C – Coordinator-General's imposed conditions

Imposed conditions provided by the Coordinator-General pursuant to part 4 division 8 of the *State Development and Public Works Organisation Act 1971* for aspects of the project that are not subject to a development approval within the Port of Townsville Strategic Port Land.

In accordance with section 54A and 54B of the *State Development and Public Works Organisation Act 1971*, **I nominate** that the following imposed conditions apply to the project to the extent that:

(a) the project does not involve a material change of use that, under the *Sustainable Planning Act 2009*, is impact assessable

(b) division 4, subdivision 2 and divisions 5, 6, 6A, and 7 of the *State Development and Public Works Organisation Act 1971* do not apply to the project.

Condition 1: Detached breakwater – flooding impacts

An application for a development permit for construction of a detached breakwater must be accompanied by an assessment report prepared by a suitably qualified and experienced engineer demonstrating non-worsening of flooding impacts in the Ross River floodplain for rainfall events up to and including the 100 year average recurrence interval (ARI) storm event. This is not required if the breakwater configuration is no different to option C described by figure 1-11 of the EIS.

The Chief Executive of TCC is the entity with jurisdiction for this imposed condition.

Condition 2: Navigation safety

A. Safety of navigation must be maintained during all stages of development. Navigation aids are to be provided as specified by the Regional Harbour Master.

B. The final breakwater design must address navigation safety requirements to the satisfaction of the Regional Harbour Master including, but not limited to, the following:

   1) A dredged safety basin shall be provided to widen the navigation area at internal and external entrances to the chicane. The purpose of the dredged safety basin is to provide a safety margin in the event that more than one vessel is in the channel and to allow for the swept path of tug and tow vessels

   2) The final design shall allow clear visibility for recreation vessels. A minimum visibility distance of 225m is to be maintained to the greatest extent practicable from the marine precinct entrance through the breakwater opening. If unable to be applied for the full distance, other management strategies are to be implemented.

   3) If hydrodynamic modelling indicates that peak tidal velocities (for average spring tides) in the marine precinct entrance channel would increase by more than 10% above existing conditions, a current monitoring facility is to be located at the entrance to the marine precinct basin so appropriate advice can be provided to mariners.

The Chief Executive of DTMR is the entity with responsibility for this imposed condition.

Condition 3: Detached breakwater – sedimentation impacts

(a) An application for a development permit for construction of a detached breakwater must be accompanied by an assessment report prepared by a suitably qualified and experienced engineer predicting impacts on coastal sedimentation and estimating dredging requirements for maintenance of navigation channels. This is not required if the breakwater configuration is no different to option C described by figure 1-11 of the EIS.

(b) Submit a hydrographic survey report to DERM that quantifies any changes to the sea bed in the vicinity of the breakwater between 12 and 18 months of completion of its construction.

The Chief Executive of DERM is the entity with responsibility for this imposed condition.

Condition 4: Marine fish habitat

(a) Where practicable, the final design of all coastal structures should incorporate fish-friendly structures using Fisheries Queensland's "Fisheries Guidelines for Fish Friendly Structures".

(b) Fisheries Queensland must be consulted in completing the environmental management plans for all works that may impact on fish habitats or fishing activities during construction and operation of the project.

(c) The construction EMP must include measures to:

- Minimise the number of motile marine biota trapped when the project area is enclosed.
- Provide for the rescue, and maximise the survival, of marine biota trapped within the project area.

The Chief Executive of DEEDI (Fisheries Queensland) is the entity with responsibility for this imposed condition.

Condition 5: Acid Sulfate Soils Management Plan

A. Prior to commencement of construction finalise a site-specific Acid Sulfate Soil Management Plan. Additional ASS investigations and management plan preparation must be conducted in accordance with:

1) State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils

2) the SPP 2/02 Guideline: Acid Sulfate Soils, and with reference to the Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland (Ahern et al. 1998)

3) the Queensland Acid Sulfate Soil Technical Manual: Soil Management Guidelines (Dear et al 2002).

B. The proponent must conduct all works to ensure that no environmental harm as defined under the Environmental Protection Act 1994 is caused.

The Chief Executive of DERM is the entity with responsibility for this imposed condition.

Condition 6: Environmental Management Plan

Prior to commencement of operational works, finalise an Environmental Management Plan for the project. The plan must be based on the preliminary Environmental Management Plan (provided as section 8 of the EIS). Specific requirements must be included for:

(a) provision of appropriate waste disposal facilities for moored boats, ensuring that facilities (including sewage pump out systems) are fully operational prior to commencement of use

(b) appropriate stormwater management utilising best practice water sensitive urban design to ensure adverse impacts to receiving waters are minimised and that stormwater discharges avoid local flooding impacts

(c) appropriate storage of fuel, oil and other potential contaminants on site, including bunding, to avoid accidental spills affecting marine waters

(d) dust suppression during initial construction (earthworks), building and landscaping works

(e) where activities on-site have potential to generate air emissions greater than those considered in the EIS, install proactive monitoring of particulate matter emissions near adjacent sensitive receivers to confirm compliance with relevant Queensland health-based standards

(f) a groundwater quality monitoring program for existing and future monitoring bores, and corrective actions generally in accordance with section 3.7.4 of the EIS

(g) lighting, light screens and other measures that avoids light spill affecting the marine environment.

The Chief Executive of DERM is the entity with responsibility for this imposed condition.

Condition 7: EMP operational requirements

All components of the EMP that relate to the operational phase of the marine precinct must be incorporated into the Port of Townsville environmental management system.

The Chief Executive of DERM is the entity with responsibility for this imposed condition.

Condition 8: Megafauna and seagrass monitoring

In conjunction with monitoring required for the Environmental Management Plan for the project, additional monitoring shall include (but are not limited to) the following:

(a) In conjunction with DEEDI (Fisheries Queensland), continue annual long term seagrass monitoring surveys of seagrass distribution and abundance in Cleveland Bay generally as described in Appendix C of the MNES Report for the Townsville Marine Precinct project EIS (GHD, January 2010).

(b) Undertake marine megafauna monitoring to assess marine megafauna inhabitation of Cleveland Bay. The extent, methods and timing of monitoring shall be generally similar to the programs undertaken for the EIS and shall continue through the construction of the first stage of the project and an additional 12 months of its operation.

The Chief Executive of DERM is the entity with responsibility for this imposed condition.

Condition 9: Interaction of marine megafauna with construction noise

In conjunction with monitoring required for the Environmental Management Plan the proponent shall monitor underwater noise impulse levels (e.g. pile driving, construction dredging, bund wall construction) during construction of stage one of the project and undertake an assessment of its effects on marine megafauna.

The Chief Executive of DERM is the entity with responsibility for this imposed condition.

Condition 10: State controlled roads – conditions for stage one

A. One month prior to the commencement of haulage of fill, the proponent shall provide to the Department of Transport and Main Roads (DTMR) an amended Traffic Impact Assessment (TIA) using the following parameters:

    1) using 98th percentile queue lengths

    2) using the following directional splits for analysis

        i) 0% of traffic using TPAR during construction of stage one

        ii) 60% of traffic using Boundary Street and Archer Street and 40% of traffic using TPAR once TPAR has opened

The amended TIA shall form part of an overall Road Impact Assessment as outlined below.

B. The proponent shall submit to the DTMR a Road Impact Assessment (RIA) for stage one. The RIA shall examine and detail the nature and extent of all likely safety, efficiency and road pavement impacts by project-related traffic on the state-controlled network for each of following aspects of each stage of the development:

    1) the haulage of fill

    2) any haulage of dredged material, where it is anticipated that removal of dredged material from the site will exceed 10,000 tonne during the life of the project.

C. Due to the current uncertainties surrounding source location, possible changes in the quantity of fill, and to ensure the DTMR is able to assess and manage any impacts on the affected network, the applicant shall include in the RIA a list of suppliers of fill for the project together with quantities of fill. The list shall include:

    1) location of quarry of fill material

    2) quantity to be supplied by each supplier

    3) contact details of each individual supplier.

D. The RIA shall be prepared in accordance with the DTMR's *Guidelines for the Assessment of Road Impacts of Development* and in consultation with the DTMR's Northern Regional Office. Once completed, the RIA shall be submitted to the Director of that office for approval.

E. From the information obtained through the RIA process, the proponent shall produce a Road-use Management Plan (RMP) for stage one. The RMP shall be prepared to detail mitigation strategies for traffic impacts on state controlled roads that the proponent will implement prior to the construction and operation phases of each stage of the development. The RMP will provide traffic generation information such as volumes, proposed transport routes, vehicle types, hours of haulage or construction and so on. It will detail any required road infrastructure maintenance and/or upgrades that may be required to mitigate road impacts and outline any necessary conditions about access, transport scheduling, dust control and road safety and so on. The DTMR must give consideration to and written approval of the RMP prior to the RMP's implementation.

F. The RIA and RMP must be completed and approved by the DTMR prior to commencement of haulage of fill or removal of dredged material.

The Chief Executive of DTMR is the entity with responsibility for this imposed condition.

Condition 11: State controlled roads - conditions for all development stages

A. The proponent shall provide a B-Double turning opportunity, where B-Doubles can turn without entering the secure area, prior to the haulage of fill or removal or dredged material. This turning facility must be retained for the life of the development.

B. Prior to the construction of rail infrastructure directly adjacent to any stage of the marine precinct, a permanent, two-way, grade-separated vehicle access to the marine precinct shall be designed and constructed, in accordance with DTMR and QR standards.

C. The proponent shall provide a traversable public transport bus route and bus stop/s through the completed development in accordance with the DTMR's guidelines, policies and regulations current at the time of completion of development. Bus indent bays shall be designed and incorporated into the internal road network at operational works stage.

D. Where dry berths and/or moorings facilities are provided, sufficient parking and turning opportunities for vehicles towing boat trailers must be located within the marine precinct.

The Chief Executive of DTMR is the entity with responsibility for this imposed condition.

Condition 12: State controlled roads - conditions for all stages other than stage one

A. Prior to the commencement of construction of a development stage other than stage one, the proponent shall provide to the DTMR, a Traffic Impact Assessment using the following parameters, unless otherwise specified by the department:

    1) using 98th percentile queue lengths

    2) using the following directional split for analysis

        i) 100% of traffic using Boundary Street and Archer Street if TPAR is not complete

        ii) 60% of traffic using Boundary Street and Archer Street and 40% of traffic using TPAR once TPAR has opened

    3) be based on a 10 year planning horizon from the proposed date of completion of the proposed development and include the following scenarios

        i) Without development

        ii) With cumulative development (cumulative development, for the purposes of the TIA, shall be understood as the proposal that is the subject of the development application, plus those precincts previously applied for/approved.)

        iii) With full development.

    The amended TIA shall form part of an overall Road Impact Assessment as outlined below.

B. Prior to the commencement of construction of a development stage other than stage one, the proponent shall provide to the department, a Road Impact Assessment (RIA). The RIA shall examine and detail the nature and extent of all likely safety, efficiency and road pavement impacts by project-related traffic on the state-controlled network for each of following aspects of each stage of the development:

   1) the haulage of fill

   2) any haulage of dredged material, where it is anticipated that removal of dredged material from the site will exceed 10,000 tonne during the life of the project

   3) construction.

C. To ensure the DTMR is able to assess and manage any impacts on the affected network, the applicant shall include in the RIA a list of suppliers of fill for the project together with quantities of fill. The list shall include:

   1) location of quarry of fill material

   2) quantity to be supplied by each supplier

   3) contact details of each individual supplier.

D. The TIA and RIA shall be prepared in accordance with the DTMR's *Guidelines for the Assessment of Road Impacts of Development* and in consultation with the Director of the DTMR's Northern Regional Office. Once completed, the RIA shall be submitted to the Director of that office for approval.

E. From the information obtained through the RIA process, the proponent shall produce a Road-use Management Plan (RMP). The RMP shall be prepared to detail mitigation strategies for traffic impacts on state controlled roads that the proponent will implement, three months prior to commencement of operational works, for the construction and operation phases of each subsequent stage of the development. The RMP will provide traffic generation information such as volumes, proposed transport routes, vehicle types, hours of haulage or construction and so on. It will detail any required road infrastructure maintenance and/or upgrades that may be required to mitigate road impacts and outline any necessary conditions about access, transport scheduling, dust control and road safety and so on. The DTMR must give consideration to and written approval of the RMP prior to the RMP's implementation.

F. The RIA and RMP must be completed and approved by the DTMR prior to commencement of each stage of operational or building works or removal of dredged material.

G. For development stages other than stage one, the proponent shall enter into an agreement with the DTMR to formalise mitigation strategies. The agreement will include:

   1) any necessary road maintenance and upgrades identified in the finalised RMP to ameliorate any adverse impacts of the road use by the marine precinct on state controlled roads based on a ten year design horizon from full development of each stage and at ultimate development of the marine precinct

   2) staging and form of grade-separated access

   3) staging of public transport infrastructure

   4) provision of any boating facility parking (if required).

H. An agreement between the proponent and the DTMR must be entered into prior to the commencement of any development stage other than stage one. If the agreement is not concluded within three months of the submission of the RMP, the parties shall refer the matter to the Coordinator-General.

The Chief Executive of DTMR is the entity with responsibility for this imposed condition.

END OF COORDINATOR-GENERAL'S IMPOSED CONDITIONS SCHEDULE C

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