PORT of TOWNSVILLE

North Queensland

Section 1
Introduction

Townsville Marine Precinct Project

Environmental Impact Statement

GHD

1. Introduction

1.1 Project proponent

The Port of Townsville Limited (POTL) is the proponent for the commercial marine precinct project (known as the Townsville Marine Precinct Project or the "Project"). POTL is a government owned corporation and a port authority under the *Transport Infrastructure Act 1994*. POTL is responsible for managing and developing the Port of Townsville.

POTL has commissioned GHD Pty Ltd to prepare the Environmental Impact Statement (EIS) for the Townsville Marine Precinct Project (TMPP).

1.2 Project description

The Port of Townsville (the Port) is a seaport located in Townsville, north Queensland (Figure 1-1). The Port is the third largest seaport in Queensland handling exports and imports including, but not limited to, mineral ores, fertiliser, sugar and motor vehicles.

The Townsville Marine Precinct Project (TMPP or the 'Precinct') is proposed to be located on intertidal land to the south-east of existing Port operations. The Precinct seeks to provide a dedicated industrial marine precinct facility at the mouth of the Ross River in the Port of Townsville.

The TMPP will address the ongoing and increasing demand for industrial marine facilities in the region by providing a sheltered, purpose-built precinct for the co-location of similar marine-dependant industries and public facilities currently spread around Ross Creek and South Townsville.

Facilities to be provided within the industrial precinct are detailed in Section 2; in brief these may include:

- Marine industry allotments including maritime infrastructure and vessel fabrication;
- Berth facilities including for 50 trawlers, scientific and tourism vessels, provisioning activities, refuelling and for commercial and recreational users;
- Commercial and recreational chandlery;
- Defence force marine activities, including vessel maintenance
- Seafood industry cold storage and distribution facility;
- Small scale eateries to service industry within Precinct;
- Marine industry training facilities;
- Public and recreational use facilities including provision for 40 pile moorings and a recreational marina.

LEGEND

● Locality — Major Road ▨ Proposed Marine Precinct and Breakwater Option ▭ Local Government Area ▬ Builtup Area

1:40,000 (at A4)

0 250 500 750 1,000

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

N

Port of Townsville
Marine Precinct EIS

Job Number 42-15399
Revision A
Date 01 July 2009

Townsville Port

Figure 1-1

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To provide the dedicated marine precinct facility it is proposed to reclaim approximately 34 hectares of currently intertidal Strategic Port Land (SPL) located to the south-east of existing port operational facilities. Industrial facilities will then be constructed on this reclaimed land. A breakwater will be positioned offshore from the facility to protect it from incident wave activity (Figure 1-2). In addition to needs for land reclamation and breakwater construction, dredging activities will be required to create an inner harbour and swing basin for the facility.

The project has been discussed since the 1970's and in 2007 was identified as a key infrastructure component of the Townsville City-Port Strategic Plan (Department of Infrastructure, 2007). The provision of a new facility to which existing marine industries from around Ross Creek and South Townsville could relocate may trigger redevelopment of the sites vacated by these industries, which are identified in the plan and on Figure 1-3.

The proponent has estimated that the capital expenditure required to deliver the project will range between $100 million to $150 million and that it will employ approximately 500-550 people (Peron 2008, Section 5).

The construction workforce is estimated at approximately 318 direct and 162 indirect employees, including the marketing and construction workforce for redevelopment of upstream vacated sites (refer Section 5). In the economic assessment undertaken for this EIS AEC*group* has calculated that the existing Ross River marine industry currently contributes $113 million annually into the Northern Statistical Division (SD) and $143 million annually into Queensland's economy including direct and flow-on activity (in 2009 dollars). They further estimate that after completion there is the potential to grow the sector by $9 million annually in the SD.

1.3 Project objectives and scope

1.3.1 Objectives and scope

Townsville region is experiencing continued growth. This has resulted in encroachment of residential development on Townsville's waterways and limited 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. An additional catalyst for the development of the Precinct is the Department of Main Roads' Townsville Port Access Road (TPAR), which includes a low-level fixed bridge, 7m at Highest Astronomical Tide (HAT), across the Ross River. This bridge has a programmed construction date of completion of December 2011 and will impose height restricted access to existing upstream marine industrial facilities mid 2011.

LEGEND

Proposed Marine Precinct	Shed	Fuel Berth	Potential Temp. Hardstand Site	Breakwater Option C (Preferred)
Stage 1	Maintenance (Open Hardstand)	Marine Infrastructure	Unloading Berth	Min and Max Option
Stage 2	Industrial Shed	Ramp	Trawler/Commercial Berth	
Stage 3	Barge Berth	Shed - Stage 3	Work Berths	

1:10,000 (at A4)

0 50 100 150 200 250

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

N

Port of Townsville
Marine Precinct EIS

Job Number 42-15399
Revision A
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Marine Precinct and Breakwater Reference Design

Figure 1-2

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Data source: Marine Precinct - ©The State of QLD (Port of Townsville LTD) 2009; Aerial (flown 2004) - ©The State of Queensland (Department of Environment and Resource Management). Created by: TH

1	Australian Defence Force Ten Terminal Regiment	5	Curtain Brothers	9	Sunferries
2	Ross River Marina, commercial trawler fleet and NQ Marine Fresh Seafoods	6	Townsville Water Police	10	Curtain Bros.
		7	Harbourside Coldstores	11	Riverside Marine (Magnetic Is. Car Ferry)
3	Rosshaven Marine	8	Riverside Marine	12	Regional Harbour Master, Townsville MSB
4	Pacific Marine Group				

1:15,000 (at A4)

0 100 200 300 400 500

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

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Port of Townsville
Marine Precinct EIS

Job Number 42-15399
Revision A
Date 01 July 2009

Existing Marine Industries Adjacent to the Precinct Development Site

Figure 1-3

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Key objectives for the Marine Precinct are, therefore, to:

- Co-locate compatible activities in Townsville;
- Increase capacity to service the existing commercial marine activities in the region;
- Grow the local marine industry through the development of a dedicated industrial marine precinct;
- Cater for the industrial marine services that will be required with the anticipated growth in boating in the region;
- Achieve higher standards of marine industry operating practice;
- Provide opportunities to increase competition within the Marine Precinct;
- Deliver a solution that provides an alternative location opportunity for industries currently located elsewhere that may be effected by the TPAR project; and
- Create opportunities to redevelop any Port land vacated by industries that choose to locate within the Precinct facility.

The Environmental Impact Assessment (EIA) that has been undertaken is for the TMPP and has been prepared by GHD Pty Ltd for the POTL. A Terms of Reference (ToR) for this EIA has been developed based on the outcomes of the Initial Advice Statement (IAS), the requirements of relevant government agencies and submissions from stakeholders and the community.

POTL is undertaking a parallel process to that conducted for this EIA to engage a proponent to undertake development and operation of the Marine Precinct. A Reference Design, described in detail in Section 2, has been developed in consultation with developer groups through POTL to facilitate conduct of this EIA. To meet timing needs for development of industrial facilities to service industries effected by the impending TPAR bridge closure the reference design has been developed with staged construction. This is described below.

1.3.2 Staging

The detailed staged development concept for the Marine Precinct has been developed in accordance with the Demand Analysis undertaken as part of the Feasibility Study (Peron Group 2008). This staged delivery allows for the progressive development of the Precinct as demand warrants, whilst allowing for the fast tracked development of Stage 1 to cater for accommodation of required activities prior to the TPAR bridge construction completion in December 2011 (Peron Group 2008) prior to closure of the last span of the TPAR bridge mid 2011.

The development method of all stages of the Marine Precinct will include construction of bunds and rock revetment and the importation of fill from terrestrial sources or the reclamation of material from dredging activities. In brief, studies have assessed material to be dredged for construction processes is potentially unsuitable for reclamation works and contains potential acid sulfate soils.

Stage 1

Due to the construction schedule of the TPAR Bridge crossing and subsequent access restrictions for upstream activities, issues surrounding the continuation of vessel servicing and

fishing fleet activities in Townsville need to be addressed. The Stage 1 concept has been developed to accommodate these activities, essential to the marine industry in the Townsville region, by incorporating the specific functional requirements of these activities in a fast tracked development scenario able to be constructed by the bridge completion date.

To achieve continuous operation of marine industry activities in the Townsville region during the period of TPAR bridge completion, Stage 1 development of the Precinct will support the following capabilities:

- 50 berths, capable of accommodating a fishing trawler up to 15m long;
- Loading, unloading and provisioning wharf for a minimum of 10 vessels;
- Provisioning, sullage and refuelling docks for both recreational and commercial users (minimum of two vessels);
- Maritime fabrication of at least 2 hectares that may be initially located on a temporary hardstand area (on land previously reclaimed by POTL) with access to barge loading facilities;
- Barge berthing facility plus a vehicle ramp;
- General purpose berthing wharf or jetty of 80m; and
- Commercial/larger vessel straddle carrier or travel lift of at least 180t capacity plus hardstand, offices and work sheds.

Stage 1 of the Marine Precinct is expected to be in place and operational by 30 June 2011.

Stage 2

Stage 2 of the concept plan encompasses the reclamation of approximately 12 hectares of land to cater for further marine industries surrounding a seven hectare inner harbour and the progressive development of vessel maintenance and industrial buildings and in-water work berths. In conjunction with development of the industrial Precinct infrastructure there is potential for development of an offshore breakwater to protect the external quayline of the Precinct facility from incident wave action.

This stage of works aligns with anticipated demand growth, utilisation trends and revenue projections (Peron Group 2008). Activities permitted within the facility include:

- Maritime infrastructure fabrication;
- Commercial and recreational vessel construction and maintenance (land-based);
- Work berths within a safe all weather harbour area;
- Commercial and recreational chandlery;
- Tourist vessel berthing;
- Scientific vessel berthing;
- Defence force marine activities, including naval vessel maintenance;
- Seafood industry cold storage and distribution;
- Small scale eateries to service industry within the Marine Precinct;

- Marine industry training facilities;
- Heavy vessel slip or lift;
- Floating dock;
- Recreational boat dry stack storage (covered or uncovered) with associated lift out facilities;
- Recreational marina to accommodate vessels up to maximum 25 metres length; and
- Boat sales.

It is envisaged that Stage 2 will be progressively developed with completion by 30 June 2015, by which time all work areas will be fully utilised with capital injection timed to coincide with market demand (Peron Group 2008).

Stage 3

The Strategic Port Land (SPL) identified for location of the Precinct (Lot 773 of EP2211) encompasses an area of land of approximately 32 hectares of tidal sand/mud flats. The areas to be developed in Stages 1 and 2 do not propose to fully reclaim the site in its entirety. An area of approximately 10 hectares forms Stage 3.

Any further development works for Stage 3 will depend upon market demand and utilisation rates of existing developed areas. It is proposed that the developer will reclaim and construct the necessary usable areas for Stage 3 of the development as the market demands (Peron Group 2008). This activity will be progressive following on from Stage 1 and 2 developments. Industries and uses of Stage 3 will be compatible with the Precinct and relevant planning requirements. It is expected that Stage 3 development will be completed by December 2017.

Redevelopment of Vacated Upstream Lands

The provision of a purpose-built facility with contemporary environmental controls will also allow for remediation of any upstream lands that are subsequently vacated. These waterside sites would be proposed for redevelopment into mixed residential / commercial consistent with the Townsville City Plan.

1.4 Project need, costs and benefits

1.4.1 Overview

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

This section summarises:

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

1.4.2 Justification

The concept of a dedicated marine industrial precinct facility located in the mouth of Ross River has been discussed since the 1970's. The previously considered alternatives are described below in Section 1.5. Since the Precinct was first envisaged new environmental management and marine park legislation have been gazetted and trade and commercial activities in Townsville have grown considerably.

The Townsville City-Port Strategic Plan 2007 revisited need for a marine precinct facility dedicated to Townsville's heavy marine industries and small boating facilities. The Plan also indicated the facility should address pressing need for expansion of Townsville's marine services industry sector by catering for marine activities including shipbuilding, ship repair, commercial fishing, small boat ramps and marine search and rescue services. A necessary element was considered to be a breakwater on the eastern bank opposite the precinct to shelter a number of protected pile moorings for small to moderate sized vessels. With development of the TPAR the Precinct was considered essential for continued capability of providing industrial marine services in the Townsville region.

As noted under Section 1.3.2 the TPAR bridge closure is programmed for mid 2011. This provides impetus for development of a facility to cater for industries and vessels affected by that development. In response the POTL commissioned an assessment of financial, social and environmental impacts of the proposed development to inform the feasibility of the development (Peron Group 2008). This study provided a number of conclusions and recommendations that demonstrated positive benefits to the region, including:

- Potential for economic growth by providing new opportunities for business expansion;
- Potential for job creation through construction and operation of the facility;
- Potential for development of dedicated recreational facilities, including marinas and boat ramps;
- Amelioration of potential social and economic impacts resulting from restricted access to the Ross River by vessels due to the TPAR development;
- Amelioration of potential social impacts resulting from conflicting land uses as residential developments expand to occupy water ways adjacent to existing commercial industry facilities; and
- Reduction of potential for environmental harm by co-locating disaggregated industrial facilities into a modern facility with best practice environmental management infrastructure.

The Precinct was considered to be technically feasible, commercially viable, and in accordance with state and local planning objectives for the Townsville region (Peron Group 2008). On this basis POTL has proceeded with the current studies.

In its current proposed form, the Precinct facility proposes consolidation of slipways, vessel maintenance facilities and associated marine service industries that are currently scattered around South Townsville and Ross Creek (refer Figure 1-3).

There is a pressing 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 will provide an opportunity to co-locate

similar marine-dependent industries in the one place and will enable the provision of best practice environmental management infrastructure (GHD 2008).

Because these industries are no longer compatible with inner city residential lifestyles, the potential for conflict between land uses will only increase the longer they remain in the old locations. The region's economic growth extends from its diversified economy. Townsville is the most populated centre in north Queensland and the administrative centre for the region.

POTL may justify capital investment in the proposed development on the basis that the following benefits could be derived:

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

The provision of a purpose-built facility with contemporary environmental controls will also allow for remediation of any upstream lands that are subsequently vacated. Following vacation of this area by commercial operators (and their associated vessels) the on-water environment is expected to be quieter upstream of the bridge. These waterside sites would be proposed for redevelopment into mixed residential / commercial consistent with the Townsville City Plan.

1.4.3 Relationships to other projects

The Project does not directly relate to any other actions being undertaken by the POTL. However, the Project is associated with the Department of Main Roads project (TPAR) for a low-level fixed bridge of 7 m at Highest Astronomical Tide (HAT) across the Ross River, which has a programmed construction of its 'last span' by July 2011. The timeline of the TMPP has been brought forward by the construction of this bridge. The resultant access restrictions imposed on the existing commercial marine activities on Ross River has hastened the requirement for the development of a Precinct to cater for existing industry needs and to provide for the realisation of potential Port growth and further Townsville's status as the North Queensland economic gateway (Peron Group 2008).

A number of other coastal developments are being undertaken in the Townsville region concurrently. These include:

- Investigations related to the Townsville Port Expansion (POTL);
- Development of the Townsville Ocean Terminal (City Pacific Ltd); and
- Development and expansion of Berths 12 ,10 and 8 within the Townsville Port (POTL).

None of these projects is directly related to the Precinct project in regard to construction and development processes. However, there is potential for cumulative environmental impacts to the region resulting from concurrent developments. Any cumulative impacts of relevance to the Precinct have been addressed under the relevant sections of this report.

1.5 Alternatives to the project

1.5.1 Previously considered alternatives

Investigations into the potential for a Marine Precinct in this location have been documented since 1977 when a fishing boat haven development was proposed in the mouth of Ross River to provide:

- An anchorage enclosed by rock breakwaters on three sides (crest RL +4.5 m), with an entrance located to protect the anchorage from prevailing weather;
- Moorings for up to 50 boats of up to 30 m in length at mooring jetties; and
- Service wharf, fuelling pontoon and slipways, with substantial adjacent land area for service buildings.

In 1995 a concept design for a small boat harbour in the mouth of Ross River was developed for the Townsville Port Authority (now POTL; Paterson 1995) and in 1999 a study was undertaken of the minimum development options required to realise a commercial marina development on Ross River (SKM 1999).

Through the Townsville Port Authority's planning review for rationalising the utilisation of Port land and the adjacent waterways the need was continuously recognised for a dedicated marina facility located within the mouth of Ross River on the Strategic Port Land (SPL) currently proposed for development. In 2003 a revised and updated concept plan for a marine precinct was produced (Figure 1-4).

To reflect the needs of the region the 2003 Townsville Marine Port Precinct was proposed to include a slipway, commercial fleet and support maritime industries, concepts that persist to the current proposed development. The concept plan also illustrated the changed and/or new development proposals across a range of Port Lands, including that areas up Ross River currently utilised for commercial purposes be redeveloped into residential lands.

In 2006 the notion of a dedicated marina facility in the mouth of Ross River was revisited in a Prefeasibility Study (Maunsell 2006) that considered viability of the development with inclusion of slipways, barge ramps, ship-lifts, docking and associated mooring facilities, workshop facilities, water and fuel services. Protection of the facility from wind and passing boat wash was to be achieved through construction of a breakwater on the eastern bank of the Ross River that included:

- A northern return to minimise long wave action and afford greater protection;
- A stub-wall at the midpoint to protect the relocated private moorings from long or refractive wave action;
- A stub-wall arrangement at the marina entrance to provide protection to the trawler fleet and other marina users; and

- Connection to the proposed bridge abutment.

The proposed Precinct configuration from this study formed the basis for the concept design provided in the IAS for the present study (refer Appendix B). This Precinct concept was recognised in the 2007 Townsville City-Port Strategic Plan as a facility that should be dedicated to Townsville's heavy marine industries and small boating facilities, and to cater for marine activities including shipbuilding, ship repair, commercial fishing, small boat ramps and marine search and rescue services. A necessary element was considered to be a breakwater on the eastern bank opposite the precinct to shelter a number of protected pile moorings for small to moderate sized vessels. With development of the TPAR the Precinct was considered essential for continued capability of providing industrial marine services in the Townsville region.

In its current form, the Precinct facility proposes consolidation of slipways, vessel maintenance facilities and associated marine service industries that are currently scattered around South Townsville and Ross Creek (refer Figure 1-3). As noted above a new purpose built facility will provide an opportunity to co-locate similar marine dependent industries and enable the provision of best practice environmental management infrastructure.

Figure 1-4 2003 Townsville Marine Port Precinct Concept Plan (reproduced from Maunsell 2003 with permission from POTL)

1.5.2 The 'do nothing' case

The 'do nothing' option increases the potential for social and environmental conflict between land uses. Many of these marine industries are no longer compatible with inner city residential lifestyles and the potential for conflict between land uses will only increase the longer they remain in the old locations. Requirements for more stringent environmental management will continue to increase, which may require some existing industries to upgrade their current facilities to continue to meet environmental controls.

Further, closure of the river access to large vessels resulting from the completion of the bridge will restrict operational capability of existing upstream industries given the expected bridge height restrictions of 6m operational height above HAT. In the extreme this could result in closure of some upriver businesses. This was identified during the assessment of social impacts of the TMPP, through the course of this EIS study (refer Section 4). It was noted that Ross River marine industries and businesses could likely be forced to either close or relocate to other areas within the region if they are not able to occupy the TMPP. Potential for relocation opportunities within Townsville were considered low. As such, under the 'do nothing' option negative impacts on the business and economy of the Townsville region could be expected as a result of direct impacts upon existing Ross River marine industries and businesses that will be effected by the TPAR. Indirectly, this closure could likely have flow-on impacts to local stores, public bars and hotels, maritime equipment suppliers and seafood outlets and potentially schools, given that any family relocation would effect school numbers and potentially staffing within those schools. The Townsville area would, therefore, have a notable negative economic impact resulting from both direct and indirect effects as a consequence of not proceeding with the development of the Precinct despite the completion of the TPAR. This finding is further supported by economic assessments completed during the course of this EIS (refer Section 5).

Alternatives to the location of a public boat ramp were considered in the report SKM 1988 Public boat Ramps North Queensland: Strategic Plan Volumes 1 and 2. Recommendations in the report include upgrades to existing boat ramps in the area and consideration of a new recreational boat ramp location on the leeward side of Kissing Point, a location likely to involve much greater environmental impact than the proposed project location, including potential impact on the Kissing Point Fort, which is listed on the National Heritage Register.

The Precinct is being developed to cater for the needs of commercial marine industries in Townsville and to provide some opportunity for expansion of those industries. Although initial concept plans for a commercial marine precinct in this location indicated the likely incorporation of public boat ramps and parking bays it has become apparent through EIS and other investigations that inclusion of those public facilities in the proposed TMPP could compromise the viability of the TMPP as a commercial marine precinct. The Strategic Port Land identified for location of the Precinct and anticipated need for industrial facilities does not provide adequate land for the recreational boat ramps and parking currently required to address the immediate shortfall in Townsville (estimated to be approximately 20 lanes) without compromising the needs of the commercial marine industries, for whom the Precinct is being developed. Reduction of commercial industrial infrastructure to allow for inclusion of recreational facilities would affect the economic growth ability of the facility and may result in conflicting land uses within the area by co-locating industrial and recreational activities.

In addition, potential development timing for the Precinct, with Stage 1 prioritised and Stage 3 potentially not completed until 2017, timelines for construction of any recreational facilities would not address immediate needs for additional boat ramps in the Townsville region.

The Port of Townsville is committed to participating, with Townsville City Council and Queensland Transport, in a broader examination of potential boat ramp sites in the Townsville region. An initial options analysis, which identified 12 potential sites including a site adjacent to the proposed TMPP, was completed in February 2009. Further investigation of 3-4 of those sites will be undertaken in coming months towards a solution for boat ramp location in the Townsville region. Environmental findings from this study are supporting that process.

Alternatives to the configuration and location of the breakwater were presented in the Feasibility Study and ToR. For this study GHD has undertaken a Breakwater Options assessment, which included an assessment of a 'no breakwater' option. A description of that assessment follows.

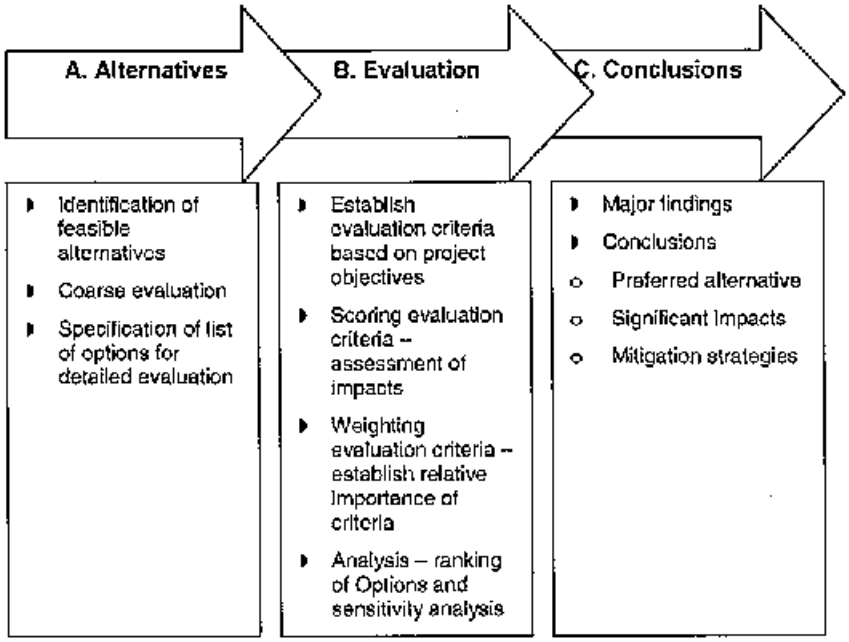
1.5.3 Breakwater Options

1.5.3.1 Overview

Investigation of breakwater options for the Precinct was achieved through a breakwater options assessment undertaken by GHD early in the EIS process. The assessment was comparative across breakwater configuration options, including a no breakwater case, using subjective criteria and rating of potential impacts. The primary aim of the assessment was to select a preferred breakwater configuration that represents the best solution after consideration of the project imperatives of operational, commercial, social and environmental impacts. Selection of a single case provided opportunity for that case to be subject to a rigorous assessment during the course of the EIS studies.

The methodology used in the evaluation was drawn from a multi-criteria assessment (MCA) framework. This framework was used to establish preferences between design options by reference to an explicit set of project objectives. The extent to which the project objectives are achieved by each design option was established by assessing the options against measurable criteria. An overview of the evaluation framework that was used to analyse the options is outlined in Figure 1-5.

Figure 1-5 Breakwater Options Evaluation Methodology



1.5.3.2 Breakwater Options Assessed

Six options were identified in workshops as potentially viable and relevant for assessment in order to select a preferred configuration option. These options included:

- Options identified in the Terms of Reference (ToR)
  - Max - ToR Max Option [Refer ToR Option 1: Longer more distant breakwater option]
  - Min - ToR Min Option [Refer ToR Option 2: Shorter, closer breakwater option]
- No breakwater option
  - No Breakwater - continuous quay line option
- Intermediate refinement of the ToR options
  - Option A – refinement of ToR Option 1 to reduce footprint
  - Option B – Refinement of ToR Option 2 to reduce footprint
  - Option C – hybrid of Options A and B

Each of the breakwater configurations was assessed and considered in conjunction with a continuous quay line reclamation for the purposes of options assessment. Schematics showing the layout of each of the options are provided as Figure 1-6 to Figure 1-11.

Figure 1-6 Max - TOR Max Option [Ref TOR Option 1: Longer more distant breakwater option]

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Option **Max** is characterised by extensive breakwater protection offshore, extending beyond the existing Eastern Reclaim Are

Option **Max** is characterised by extensive breakwater protection offshore, extending beyond the existing Eastern Reclaim Area and to the east of the Marine Precinct development. The option isolates a large expanse of water and the mud flats within the breakwater and provides an obstacle to littoral transport from the beaches to the East of the development.

Figure 1-7 Min - TOR Min Option [Ref TOR Option 2: Shorter, closer breakwater option]

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Option **Min** is characterised by breakwater protection extending alongside the Marine Precinct reclamation with a partial return just beyond the seaward extent of lot 773. The option isolates the Ross River navigation channel from the mud flats to the east and provides an obstacle to littoral transport from the beaches to the East of the development.

Figure 1-8 No Breakwater - continuous quayline option

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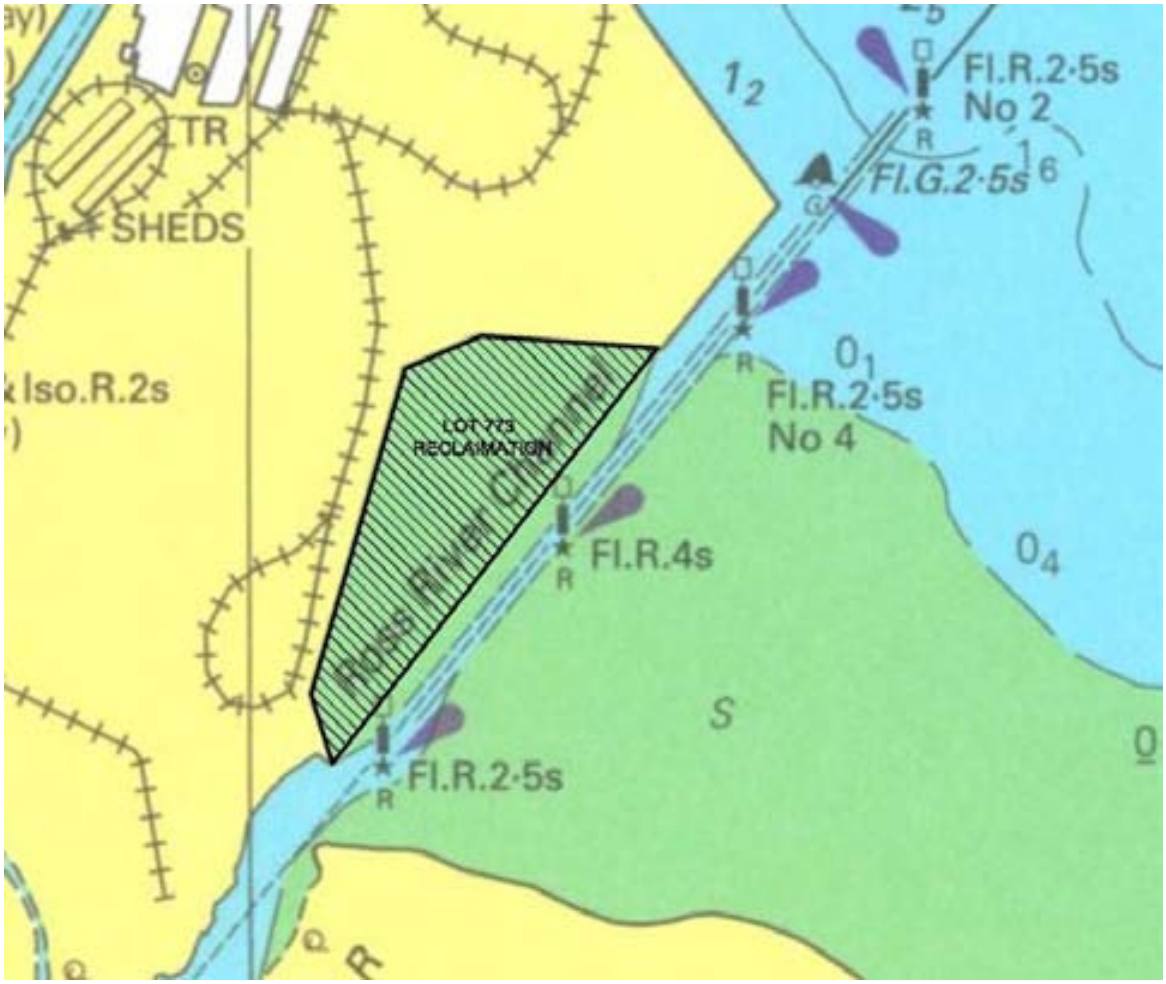

Option **No Breakwater – continuous quayline** is an option which provides a maximum area of reclaimed land within the Precinct area. This option requires the external quayline to be utilised as the "working" face for marine industries within the precinct. The precinct reclamation configuration provided by this configuration has been adopted as the base case for the reclamation configuration in all of the breakwater options assessed.

Figure 1-9 Option A – refinement of TOR Option 1 to reduce footprint

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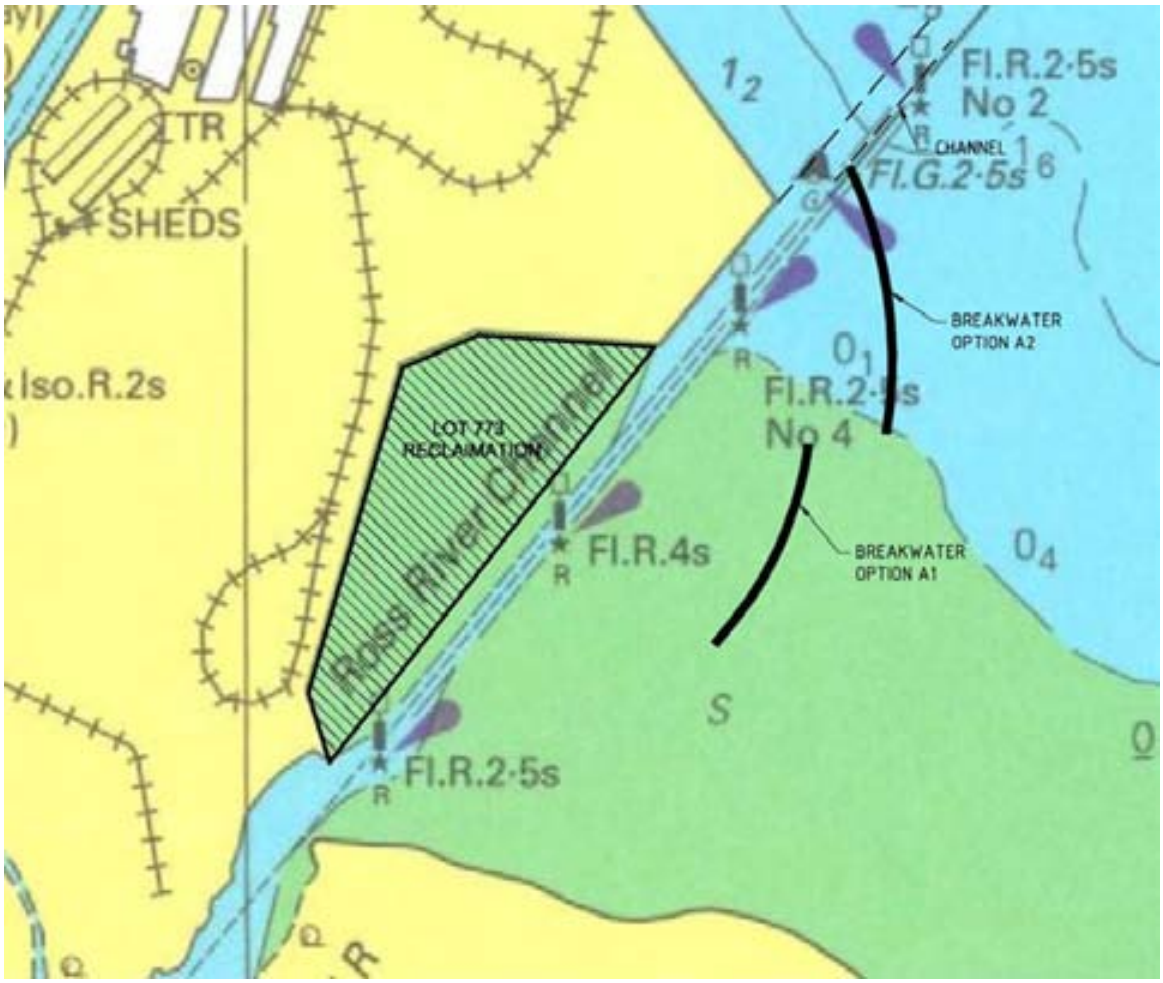

Option A is characterised by extensive breakwater protection offshore, extending beyond the existing Eastern Reclaim Area and to the east of the Marine Precinct development. The option was selected as a refinement of TOR option Max and features a split breakwater resulting in a reduced extent of rockworks and reduced isolation / containment of flows, whilst theoretically maintaining equivalent protection from waves and littoral transport. Option A was assessed in 2 configurations, requiring a refinement during wave modelling to improve performance.

Figure 1-10 Option B – Refinement of TOR Option 2 to reduce footprint

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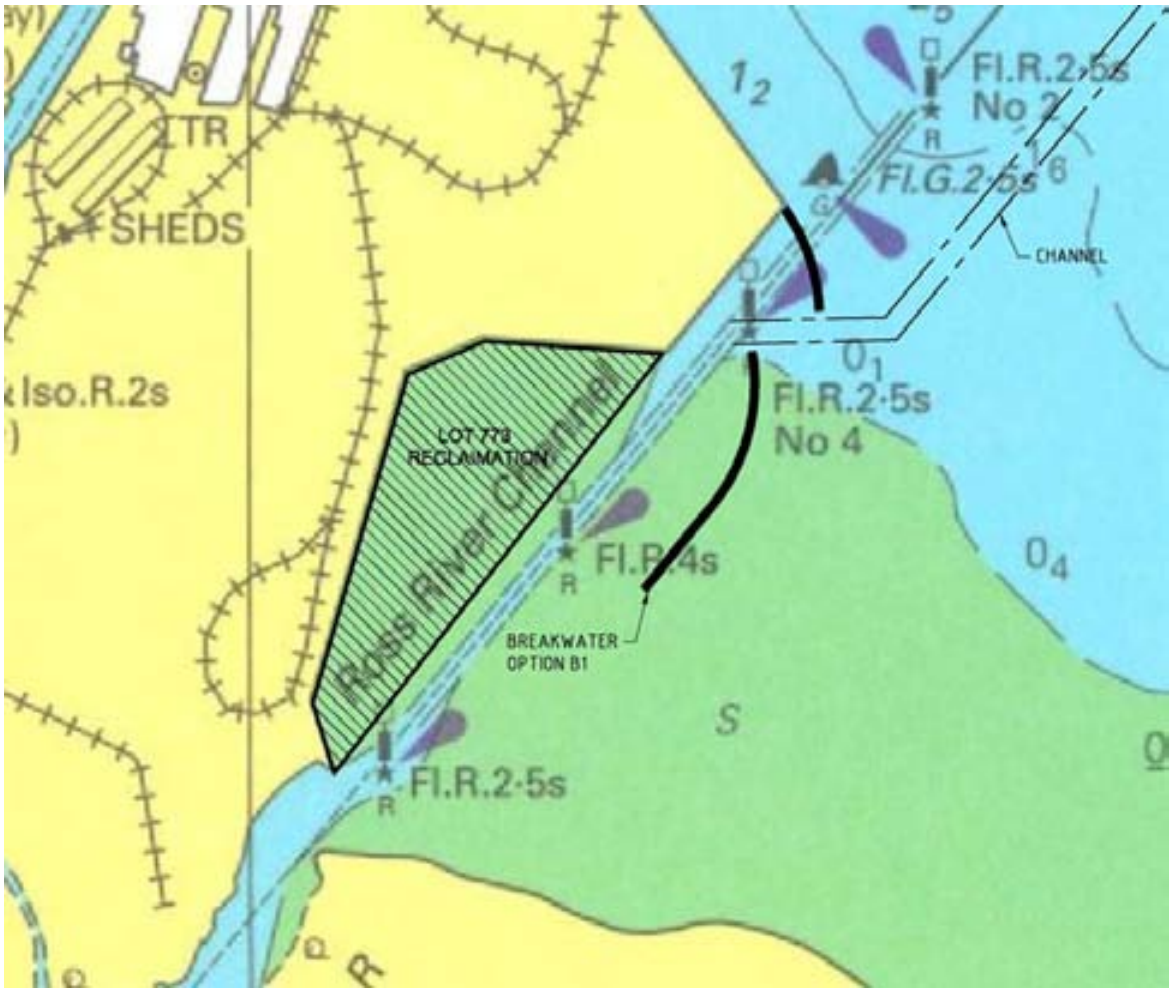

Option B is characterised by breakwater protection extending alongside the Marine Precinct reclamation lot 773 with an additional breakwater extension adjacent the end of the Eastern Reclaim Area. The option was selected as a refinement of TOR option Min and features a split breakwater providing additional protection from the predominant wave direction and reducing the impact on the mudflats to the east of Ross River.

Figure 1-11 Option C – hybrid of Options A and B

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Option C is a hybrid option developed subsequent to the initial ratings workshops and is characterised by a short breakwater extension adjacent the end of the Eastern Reclaim Area and an offshore section to seaward of the Eastern Reclaim Area. The option features a split breakwater, facilitating future port expansion to the north and east of the existing Eastern Reclaim Area, providing protection from the predominant wave direction and minimising impacts on the mudflats to the east of Ross River.

1.5.3.3 Assessed criteria

Criteria were developed in a workshop with POTL to consider the operational, commercial, social and environmental impacts relevant to the project. The criteria adopted for the assessment are shown in Table 1-1 and described in detail below.

Table 1-1 Criteria used for the Breakwater Options Assessment

Capex	Length of Breakwaters
	Capital Dredging
Operational Performance	Wave Agitation
	Shelter during Storms
	Flushing and Water Quality
	Navigation Safety
	Future Port Expansion
	Maintenance Dredging
	Provision of Swing Basin
Construction	Construction Method
	Duration of Construction
Social Impacts	Visual Amenity
	Cultural Heritage
	Fishing
Environmental Impacts	Mega Fauna Habitat Impact
	Marine Flora Issues
	Wading Bird Habitat
	Influence on Longshore Drift
	Dredging Plumes

1.5.3.4 Capex

A measure of the cost of breakwater options was assessed by comparing the length of protective rock structures required. To accommodate the differing effects of wave exposure (either direct attack or angled attack effecting crest height and rock size) and varying water depths a comparative assessment was also made on breakwater civil volumes.

The volume of capital dredging required to establish navigation channels, swing basins and remove potentially unsuitable material underneath breakwater structures was assessed as a measure of capital cost to implement the project. The assessment does not consider common volumes required to develop the marine precinct reclamation.

1.5.3.5 Operational Performance

Provision of shelter during storms and operating wave climate and has been assessed against the Australian Code AS/NZS3962. The classifications for operating wave climate nominated by this code are wave heights to be exceeded once a year;

Moderate = 0.375 m

Good = 0.3 m

Excellent = 0.225 m

An assessment of the operating wave climate has been carried out by modelling the wave penetration under a 1 yr return interval wave case.

The flushing characteristic of the area contained by the breakwater footprint was comparatively assessed against the existing performance (no breakwater/Precinct) through hydrodynamic modelling of the retention time of a conservative constituent.

Navigation safety was subjectively assessed by an experienced mariner, considering required ship manoeuvres, predominant current, wind and wave directions and the provisions for and ramifications of error.

POTL has indicated a future expansion planned to extend the existing Eastern Reclaim Area to the north. An assessment of the implications of this future expansion on the infrastructure and navigational ramifications of the Marine Precinct development was undertaken from the perspective of whether the proposed configuration may constrain or impact upon this future expansion.

A comparative assessment of siltation potential was undertaken by hydrodynamic modelling of bed shear stress impacts as a result of development of the various options. An increase in bed shear stress was taken to indicate an increase in scouring potential and a reduction in the potential to accrete silt. An assessment of each configuration was then made considering localised accretion zones, scour of the navigation channel as well as potential to block potential littoral sources from beaches to the east of the development.

The geometric constraints imposed by configuration of the breakwater options was assessed from the perspective of limitation to vessel manoeuvring and swinging.

1.5.3.6 Construction

An assessment of the dominant form of construction required to establish the breakwater options was incorporated in order to encompass the potential risk, cost and downtime contingencies inherent in offshore works.

An estimate of the duration of construction was determined for the construction of the various breakwaters. For comparison purposes, the analysis adopted transport of armour rock breakwater core material and under footprint replacement material as the principal time constraint. The comparison of construction times was based on the total estimated volume of rock and core material required to be transported to the site

1.5.3.7 Social Impacts

Visual amenity was assessed based on a subjective assessment of the degree of interference with the view toward Cleveland Point from the Benwell Road intersection. This location currently provides the public access point for activities undertaken on Lot 773 and would, therefore, be the perspective from which social impacts were detectable.

The potential to impact cultural heritage sites has been assessed on the basis of infrastructure footprint impact on the mudflats and beach system to the east of Ross River and the degree of increased public access that may be afforded to this area after the construction of the breakwater option.

The positive or negative potential impacts to public access for the purposes of commercial, recreational and indigenous fishing, crabbing and bait sourcing activities was subjectively determined based on the infrastructure footprint impact on the mudflats and beach system to the east of Ross River and the degree of increased public access that may be afforded to this area after the construction of the breakwater option.

1.5.3.8 Environmental impacts

Impact on mega fauna was assessed relative to impacts to the nearshore shallow mudflat area to the east of Ross River. Impacts from construction of the Precinct on Lot 773 are non-differentiating for breakwater configuration and are assessed under the EIS. Footprint impact, division of the habitat by structures and significant changes to the flow regime potentially impacting accretion or scour of the habitat were assessed.

Impact on marine flora was assessed based on impacts to the potential seagrass meadows and coastal mangrove communities located adjacent to and to the north and east of the eastern reclaim area. Footprint impact, division of the habitat by structures (fragmentation) and significant changes to the flow regime potentially impacting accretion or scour of the habitat were assessed.

Impact on wading bird habitat was assessed for the exposed mudflat area to the east of Ross River. Both footprint impact, access by the public and significant changes to the flow regime potentially impacting accretion or scour of the habitat were assessed.

The influence of longshore drift has been assessed by the blocking potential of the structure and the control requirements or opportunities provided by the structures forming part of the development.

An assessment of the control measures or opportunities provided by the structural constraints afforded by the development were assessed from the perspective of impact on the control and management of dredging plumes.

1.5.3.9 Non-differentiating criteria

The assessment workshop proposed and discarded a significant number of criteria as either irrelevant to the selection of the preferred option or as non-differentiating criteria (criteria for which a tangible difference could not be determined for various options).

Non-differentiating criteria considered but not progressed to rating and weighting for the development options included:

- Loss of marine invertebrates;
- Loss of marine vertebrate (non megafauna) biodiversity;
- Wind tranquillity;
- Pile moorings;
- Access to the foreshore area to the east of Ross River; and
- Beach usage activities (including ability to walk dogs).

These criteria were therefore not considered through this process; impacts are being assessed elsewhere in the EIS.

1.5.3.10 Criteria Weighting

Criteria Weighting was undertaken by assessing the relative importance of the scores across the criteria utilising a pair wise comparison where, for each pair of assessment criteria, a more/less important criteria was established leading to a weighting of relative importance for each criterion.

To complete the analysis a weighted average of scores for each of the options over each of the criteria was determined to establish an overall score for the option. The highest scoring options are regarded to be the most suitable and a preferred option has been selected on this basis.

The weighting process was undertaken by representatives of the POTL and GHD with the following focus groups:

- POTL Operations, Environmental, Project / Commercial; and
- GHD Engineering/Operational, Environmental.

A summary of the mean weighting and criteria weighting ranges is provided below in Table 1-2.

Table 1-2 Criteria Weighting

Criteria	Mean Weighting [%]	Range [%]		
Length of Breakwaters	4.4	2	-	8
Capital Dredging	4.3	2	-	7
Wave Agitation	9.0	6	-	11
Shelter during Storms	7.7	3	-	9
Flushing and Water Quality	8.3	7	-	9
Navigation Safety	10.9	10	-	11
Future Port Expansion	6.6	4	-	10
Maintenance Dredging	4.7	1	-	6
Provision of Swing Basin	5.3	2	-	9
Construction Method	3.6	1	-	6
Duration of Construction	4.1	2	-	8

Criteria	Mean Weighting [%]	Range [%]		
Length of Breakwaters	4.4	2	-	8
Capital Dredging	4.3	2	-	7
Visual Amenity	2.0	1	-	4
Cultural Heritage	4.0	1	-	6
Fishing	0.7	0	-	2
Mega Fauna Habitat Impact	6.0	4	-	8
Marine Flora Issues	5.4	2	-	8
Wading Bird Habitat	5.7	3	-	9
Influence on Longshore Drift	3.9	1	-	6
Dredging Plumes	3.9	0	-	6

1.5.3.11 Preferred Option

Options comparison was undertaken by each of the representatives across the performance criteria to establish a preferred option as well as a mean weighting of the criteria across the groups.

The various performance levels were allocated a weighting of:

- Fatal flaw = -10;
- Significant impact requiring significant control measures = 0;
- Non-significant impact able to mitigated = 1; and
- No expected impact = 1.5.

The options were compared utilising a weighted average of scores for each of the options over each of the criteria. The process determined an overall score for the option. The highest scoring options are regarded to be the most suitable and a preferred option has been selected on this basis.

The options scores are tabulated below.

Option Max		Min	No Breakwater	Option A	Option B	Option C
Mean Score	71.4	-94.6	-63	83.6	88.4	118.1
Max Score	82.5	-39.5	-11	94	95	120.5
Min Score	62.5	-114	-87	70	77	113

The preferred breakwater option identified is Option C.

This option was selected as the preferred option unanimously across the various criteria weighting provided by each of the representatives of POTL and GHD.

A discussion of the advantages and disadvantages of the preferred option (Option C) are provided below under each of the assessment criteria.

Criteria		Advantages and Disadvantages of Option C
Capex	Length of Breakwaters	Option C provides the shortest breakwater of the configurations assessed although rock volumes are slightly greater than option B due to water depths for the offshore protection structure.
	Capital Dredging	Dredging requirements to establish the swing basin and navigation channels are relatively consistent across the options assessed and most of the options including option C fall within the range of 250,000 – 300,000 m^3.
Operational Performance	Wave Agitation Shelter during Storms	Options C and B provide superior protection against wave penetration on both an annual and storm basis.
	Flushing and Water Quality	Option C is a relatively open configuration allowing relatively unconstricted flow through the main navigation channel and around the offshore breakwater structure. Flushing is not considered to be adequately impacted by Option C.
	Navigation Safety	Navigation safety is initially considered to be reduced by the constriction between breakwater with some restricted visibility but subsequently significantly enhanced by the protection afforded by the breakwater and the obstacle free area within the breakwater protected zone.
	Future Port Expansion	Due to the channel offset Option C does not constrain the future seaward expansion of the Eastern Reclaim Area.
	Maintenance Dredging	Maintenance dredging requirements are not expected to be significantly impacted by the introduction of the offshore breakwater. Opportunities to block or trap littoral transport behind a groyne structure are not provided by this option, but this is offset against a net benefit of limiting the impact on the dune and mudflat area to the East of Ross River.
	Provision of Swing Basin	The option does not provide any geometric limitations to provision for swinging vessels in a sheltered environment (up to and greater than 75m vessels).
Construction	Construction Method	Construction is partially able to be effected from the Eastern Reclaim area with the offshore breakwater section in deeper water. The draft constraints on offshore work for Option C are considered to be the least constraining of the options considered.
	Duration of Construction	Due to relatively modest quantities of breakwater material required to be transported to site the works are considered to be able to be completed more rapidly than other options assessed.
Social Impacts	Visual Amenity	The offshore structure, remote from the Benwell Road intersection is considered to have the least visual impact of the breakwater options assessed (aside from no breakwater).
	Cultural Heritage	As the option avoids a footprint over the sandbar and mudflats, and does not provide public access to the area to the East of Ross River, this is considered to be the least likely option to have an adverse Cultural Heritage impact.
	Fishing	As the option does not impact the mudflats or sand spit to the East of Ross River, no measurable impact on fishing amenity is expected.

Environmental Impacts	Mega Fauna Habitat Impact	As the option avoids a footprint over the sandbar and mudflats to the East of Ross River, this is considered to be the least likely option to have an adverse Mega Fauna impact.
	Marine Flora Issues	The option may potentially impact ephemeral seagrass beds identified offshore of the Eastern Reclaim Area.
	Wading Bird Habitat	As the option avoids a footprint over the sandbar and mudflats, and does not provide public access to the area to the East of Ross River, this is considered to be the least likely option to have an adverse impact on Wading bird habitat.
	Influence on Longshore Drift	The option is not considered to significantly impede the limited littoral transport currently exhibited.
	Dredging Plumes	The open breakwater configuration is expected to result in similar plume responses to the existing situation.

A comparative discussion of advantages and disadvantages of all other breakwater configuration options assessed relative to the preferred option (Option C) is provided below;

Criteria		**Advantages and Disadvantages of Option Max compared to Preferred Option C**
Capex	Length of Breakwaters	Option Max is considerably longer (greater than 2x) than the preferred option and rock volumes are likely to be significantly greater.
	Capital Dredging	Dredging requirements to establish the swing basin and navigation channels are consistent with the preferred option.
Operational Performance	Wave Agitation Shelter during Storms	Option Max provides significantly reduced protection than the preferred option due to direct access to the dominant incident wave direction.
	Flushing and Water Quality	Option Max provides a slight flushing restriction compared to the preferred option which is not considered to be significant in terms of water quality impacts.
	Navigation Safety	Navigation safety is considered to be enhanced compared to existing configuration due to sheltering and better than the preferred option due to unrestricted visibility.
	Future Port Expansion	Option Max does not constrain the future seaward expansion of the Eastern Reclaim Area.
	Maintenance Dredging	Maintenance dredging requirements are expected to be less than the existing configuration due to the interruption of any littoral transport from beaches to the east.
	Provision of Swing Basin	The option does not provide any geometric limitations to provision for swinging vessels in a sheltered environment (up to 75m vessels).
Construction	Construction Method	Construction is able to be effected from the shore making Option Max potentially easier to construct than the preferred option.
	Duration of Construction	Due to larger length of breakwater and quantities of breakwater material required Option Max is likely to take longer than the preferred option to complete.

Social Impacts	Visual Amenity	The Option Max structure is considered to have significantly greater visual impact than the offshore, preferred option.
	Cultural Heritage	Option Max requires a footprint over the sandbar and mudflats, providing public access and construction disturbance to the area to the east of Ross River and is therefore considered to be more culturally impacting than the preferred option.
	Fishing	Option Max provides facility for public access and is considered to provide greater recreational (fishing) amenity than the preferred option.
Environmental Impacts	Mega Fauna Habitat Impact	Option Max requires a significant footprint over the sandbar and mudflats to the East of Ross River and potentially disrupts the flow regime. This option is therefore considered to have a more adverse impact than the preferred option.
	Marine Flora Issues	Option Max may fragment the flow regime over the nearshore mudflats with similar potential impacts on offshore seagrass beds and is considered worse than the preferred option.
	Wading Bird Habitat	The option provides a footprint and public access to the sandbar and mudflats to the East of Ross River providing a significantly greater impact on wading bird habitat than the preferred option.
	Influence on Longshore Drift	Option Max is considered to provide some enhanced littoral transport opportunities through containment of the littoral material from beaches to the east when compared to the preferred option.
	Dredging Plumes	The closed breakwater configuration is expected to facilitate containment of the extent of dredging plumes.

Criteria		**Advantages and Disadvantages of Option Min compared to Preferred Option C**
Capex	Length of Breakwaters	Option Min is considerably longer (greater than 1.5x) than the preferred option and rock volumes are likely to be significantly greater.
	Capital Dredging	Dredging requirements to establish the swing basin and navigation channels are consistent with the preferred option.
Operational Performance	Wave Agitation Shelter during Storms	Option Min provides significantly reduced protection than the preferred option due to direct access to the dominant incident wave direction.
	Flushing and Water Quality	Option Min provides enhanced flushing compared to the preferred option which is not considered to be significant in terms of water quality impacts. Some adverse flood attenuation impacts upstream may be experienced from Option Min.
	Navigation Safety	Navigation safety is considered to be consistent with the existing configuration due to sheltering and better than the preferred option due to unrestricted visibility.
	Future Port Expansion	Option Min does not constrain the future seaward expansion of the Eastern Reclaim Area.
	Maintenance Dredging	Maintenance dredging requirements are expected to be less than the existing configuration due to the interruption of any littoral transport from beaches to the east.

	Provision of Swing Basin	Option Min provides geometric constraint to the swinging of vessels and is considered worse than the preferred option.
Construction	Construction Method	Construction is able to be effected from the shore making Option Min potentially easier to construct than the preferred option.
	Duration of Construction	Due to larger length of breakwater and quantities of breakwater material required Option Min is considered to take longer than the preferred option to complete.
Social Impacts	Visual Amenity	The Option Min structure is considered to have significantly greater visual impact than the offshore, preferred option.
	Cultural Heritage	Option Min requires a footprint over the sandbar and mudflats, providing public access and construction disturbance to the area to the east of Ross River and is therefore considered to be more culturally impacting than the preferred option.
	Fishing	Option Min provides facility for public access and is considered to provide greater recreational (fishing) amenity than the preferred option.
Environmental Impacts	Mega Fauna Habitat Impact	Option Min requires a significant footprint over the sandbar and mudflats to the East of Ross River and potentially disrupts the flow regime. Consequently this option is considered to have a more adverse impact than the preferred option.
	Marine Flora Issues	Option Min may fragment the flow regime over the nearshore mudflats but is not expected to impact offshore seagrass beds when compared to the preferred option.
	Wading Bird Habitat	The option provides both a footprint and public access to the sandbar and mudflats to the east of Ross River providing a significantly greater impact on wading bird habitat than the preferred option.
	Influence on Longshore Drift	Option Min is considered to provide some enhanced littoral transport opportunities through containment of the littoral material from beaches to the east when compared to the preferred option.
	Dredging Plumes	The closed breakwater configuration is expected to facilitate containment of the extent of dredging plumes.

Criteria		**Advantages and Disadvantages of Option No Breakwater compared to Preferred Option C**
Capex	Length of Breakwaters	Option No Breakwater is the least expensive option.
	Capital Dredging	Dredging requirements to establish the swing basin and navigation channels are consistent with the preferred option, no material replacement under breakwater footprints will be required and dredging volumes for No Breakwater option are less than the preferred option.
Operational Performance	Wave Agitation	The No Breakwater option does not provide protection to the external quayline of the precinct or the navigable area to the east. The tranquillity environment outside the precinct Inner Harbour does not conform to Australian Standards.
	Shelter during Storms	
	Flushing and Water Quality	Option No Breakwater is not likely to cause any flushing impacts.

	Navigation Safety	Navigation safety for the No Breakwater option is considered to be consistent with the existing configuration with access to the precinct Inner Harbour entrance and external quayline operations less safe than a protected configuration.
	Future Port Expansion	Option No Breakwater does not constrain the future seaward expansion of the Eastern Reclaim Area.
	Maintenance Dredging	Maintenance dredging requirements are not expected to be impacted and are comparable to the preferred configuration.
	Provision of Swing Basin	Option No Breakwater provides geometrically unconstrained swinging for vessels and is comparable to the preferred option.
Construction	Construction Method	Construction of the precinct is contained to the onshore reclamation works and is significantly less than the preferred option.
	Duration of Construction	The No Breakwater option can be constructed more quickly than the preferred option.
Social Impacts	Visual Amenity	The No Breakwater option has no offshore visual impact.
	Cultural Heritage	The No Breakwater option does not impact the sandbar and mudflats and is therefore comparable to the preferred option.
	Fishing	The No Breakwater option does not provide increased fishing opportunities and is comparable to the preferred option.
Environmental Impacts	Mega Fauna Habitat Impact	The No Breakwater option avoids a footprint over the sandbar and mudflats to the East of Ross River and is therefore comparable to the preferred option.
	Marine Flora Issues	The No Breakwater option will not impact seagrass beds identified offshore and is better than the preferred option in this regard.
	Wading Bird Habitat	The No Breakwater option avoids a footprint over the sandbar and mudflats to the east of Ross River and is therefore comparable to the preferred option.
	Influence on Longshore Drift	The option is not considered to significantly impede the limited littoral transport currently exhibited.
	Dredging Plumes	The No Breakwater configuration is expected to result in similar plume responses to both the existing configuration and preferred option.

Criteria		**Advantages and Disadvantages of Option A compared to Preferred Option C**
Capex	Length of Breakwaters	Option A has a breakwater length slightly larger than the preferred option.
	Capital Dredging	Dredging requirements to establish the swing basin and navigation channels are consistent with the preferred option.

Operational Performance	Wave Agitation Shelter during Storms	Option A provides significantly reduced protection than the preferred option due to direct access to the dominant incident wave direction.
	Flushing and Water Quality	Flushing time for Option A is slightly enhanced when compared to the existing and preferred configurations but is not considered to be significant in terms of water quality impacts. Some flood attenuation impacts upstream may be experienced from Option A.
	Navigation Safety	Navigation safety is considered to be consistent with the existing configuration due to sheltering and better than the preferred option due to unrestricted visibility.
	Future Port Expansion	Option A does not constrain the future seaward expansion of the Eastern Reclaim Area.
	Maintenance Dredging	Maintenance dredging requirements are expected to be less than existing due to the interruption of any littoral transport from beaches to the east.
	Provision of Swing Basin	Option A allows unconstrained swinging of vessels and is comparable to the preferred option.
Construction	Construction Method	Construction impacts of the option are considered to be difficult due to draft restrictions assuming access requirements across the sensitive mudflats will be restricted.
	Duration of Construction	A slightly longer construction duration than the preferred option is anticipated due to draft constraints imposed by working in shallow water.
Social Impacts	Visual Amenity	The Option A structure is considered to have slightly greater visual impact than the preferred option.
	Cultural Heritage	Option A requires a footprint over the sandbar but does not facilitate public access and is considered to be more culturally impacting than the preferred option.
	Fishing	Option A does not provide for public access and is consistent with the preferred option.
Environmental Impacts	Mega Fauna Habitat Impact	Option A requires a slight footprint over the sandbar and potentially disrupts the flow regime and is therefore considered to have a more adverse impact than the preferred option.
	Marine Flora Issues	The option may potentially impact ephemeral seagrass beds identified offshore of the Eastern Reclaim Area.
	Wading Bird Habitat	The option provides a footprint but no public access to the sandbar to the east of Ross River. Accretion of the sandbank due to littoral blockage may enhance wading bird habitat.
	Influence on Longshore Drift	Option A is considered to provide some enhanced littoral transport opportunities through containment of the littoral material from beaches to the east when compared to the preferred option.
	Dredging Plumes	The closed breakwater configuration is expected to facilitate containment of the extent of dredging plumes.

Criteria		Advantages and Disadvantages of Option B compared to Preferred Option C
Capex	Length of Breakwaters	Option B has a breakwater length slightly larger than the preferred option.
	Capital Dredging	Dredging requirements to establish the swing basin and navigation channels are slightly larger than the preferred option due to more extensive re-alignment of the navigation channel.
Operational Performance	Wave Agitation	Option B provides comparable protection to the preferred option.
	Shelter during Storms	
	Flushing and Water Quality	Flushing time for Option B is slightly reduced when compared to the existing and preferred configurations but is not considered to be significant in terms of water quality impacts. Some flood attenuation impacts upstream may be experienced from Option B.
	Navigation Safety	Navigation safety is considered to be consistent with the preferred configuration, offering some restricted visibility.
	Future Port Expansion	Option B does not constrain the future seaward expansion of the Eastern Reclaim Area.
	Maintenance Dredging	Maintenance dredging requirements are expected to be less than existing due to the interruption of any littoral transport from beaches to the east.
	Provision of Swing Basin	Option B allows unconstrained swinging of vessels and is comparable to the preferred option.
Construction	Construction Method	Construction impacts of the option are considered to be difficult due to draft restrictions assuming access requirements across the sensitive mudflats will be restricted.
	Duration of Construction	Construction durations consistent with the preferred option are expected.
Social Impacts	Visual Amenity	The Option B structure is considered to have slightly greater visual impact than the preferred option.
	Cultural Heritage	Option B requires a footprint over the sandbar and is considered to be more culturally impacting than the preferred option.
	Fishing	Option B does not provide for public access and is consistent with the preferred option.
Environmental Impacts	Mega Fauna Habitat Impact	Option B requires a slight footprint over the sandbar and potentially disrupts the flow regime. This option is therefore considered to have a more adverse impact than the preferred option.
	Marine Flora Issues	The option is less likely than the preferred option to impact ephemeral seagrass beds identified offshore of the Eastern Reclaim Area.
	Wading Bird Habitat	The option provides a footprint but no public access to the sandbar to the east of Ross River. Accretion of the sandbank due to littoral blockage may enhance wading bird habitat.

	Influence on Longshore Drift	Option B is considered to provide some enhanced littoral transport opportunities through containment of the littoral material from beaches to the east when compared to the preferred option.
	Dredging Plumes	The closed breakwater configuration is expected to facilitate containment of the extent of dredging plumes.

1.5.3.12 Summary

The Multi Criteria Analysis completed for the assessment of the breakwater options evaluated the performance of six Breakwater options, including a no breakwater option, against a number of criteria including cost, operational performance, construction, social and environmental impacts.

Using the weighting system determined through workshops the strongest performing option was Option C. Option C is a second stage refinement of options following on from the initial screening and weightings workshop and has been designed to optimise operational performance whilst minimising footprint impacts on the area to the east of Ross River.

Option C breakwater configuration has been adopted for the EIS studies.

1.6 The environmental impact assessment process

1.6.1 EIA process and methodology of the EIS

On 22 August 2008, the Coordinator-General (CG) declared the Project to be a 'significant project' for which an EIS was required pursuant to section 26(1)(a) of the *State Development and Public Works Act 1971* (Qld) (SDPWOA).

On 3 November 2008, the Australian Government Minister for the Department of the Environment, Water, Heritage and the Arts (DEWHA) determined that the Project is a 'controlled action', which requires assessment and approval under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBCA). The controlling provisions are:

- Listed threatened species and communities (sections 18 & 18A);
- Listed migratory species (sections 20 & 20A);
- Wetlands of international importance (section 16 & 17B);
- World Heritage properties (section 12 & 15A);
- National Heritage places (section 15B &15C).

The statutory impact assessment process under the SDPWOA is also the subject of a bilateral agreement between the Queensland and the Commonwealth Governments in relation to environmental assessment under the EPBCA. Pursuant to the bilateral agreement this EIS addresses the requirements of both State and Commonwealth legislation.

The Department of Infrastructure and Planning will manage the EIS assessment process on behalf of the Coordinator-General. A draft Terms of Reference (ToR) has been prepared as the first stage of the EIS process. The Coordinator-General invited comments on the draft ToR for the EIS process. Submissions on the draft ToR closed on 5 pm Monday 22 December 2008.

Submissions on the draft ToR were considered and, where appropriate were incorporated into the final ToR. A copy of the final ToR for the Project included as Appendix C[1].

The EIS has been developed in the following phases:

- **Data Collection and Review:** This included collation of all available relevant data for the Project area from previous studies specific to the development and general studies within the region. New data was also collected were existing references were insufficient.
- **Specialist Studies:** Several specialist studies were undertaken to provide input into the EIS. These included:
  - Sediment sampling and analysis;
  - Hydrodynamic and water quality modelling;
  - Sampling of water quality;
  - Flora and Fauna assessments, including terrestrial and aquatic systems;
  - Noise and Air Assessments;
  - Cultural Heritage Assessment
  - Social Impact Assessment; and
  - Economic Impact Assessment.
- **Description of the Environment Values:** Based on the data collection and specialist studies conducted for the Project, a detailed description of the existing environment values was prepared. The purpose of this phase is to provide a baseline from which to determine potential impacts associated with the Project.
- **Description of Potential Environmental Impacts:** The identification and quantification of potential impacts that may result from development of the Project is based on an analysis of known impacts associated with the proposed works, from previous knowledge and experience, and the characteristics of the areas to be impacted. From this analysis, potential impacts can be identified and quantified (where possible) and possible mitigation strategies developed where necessary to minimise the potential impacts.
- **Development of the Environmental Management Plan:** The Environmental Management Plan details the implementation strategies for the development of the Project to achieve the mitigation strategies identified to minimise potential impacts.

1.6.2 Objectives of the EIS

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

The EIS should be a self-contained and comprehensive document that provides sufficient information for an informed decision on the potential impacts of the project and the

[1] The ToR were developed with knowledge of the EPBC Referral for the project, which forms Appendix D.

management measures employed to mitigate adverse impacts. The EIS document should provide information for the following persons and groups, as the project "stakeholders":

- Interested persons and bodies as a basis for understanding the project, prudent and feasible alternatives, affected environmental values, potential impacts that may occur and measures to be taken to mitigate potential adverse impacts;
- Groups or persons with rights or interests in the land as an outline of the potential effects of the project on that land including access arrangements;
- Government agencies as a framework for decision-makers to assess the environmental aspects of the project with respect to legislative and policy provisions and based on that information to make an informed decision on whether the project should proceed or not and if so, on what conditions, if any;
- The Commonwealth Minister for the Environment, Heritage and the Arts as information to determine the extent of potential impacts of the project on matters of national environmental significance, in particular the controlling provisions under the EPBCA: sections 12 and 15A (world heritage properties), sections 18 and 18A (listed threatened species and communities) and sections 20 and 20A (listed migratory species);
- The proponent as a mechanism by which the potential environmental impacts of the project are identified and understood and information is provided to support the development of management measures including an environmental management plan (EMP), to mitigate the adverse effects of residual environmental impacts of the development.

1.6.3 Submissions

The EIS will be publicly notified to enable the public to review and make submissions in relation to the findings of the EIS. Each submission will be reviewed by POTL and taken into account in finalising the EIS. Submissions on the EIS may be made to the Coordinator-General during the submission period set by the Coordinator-General.

For an environmental impact statement, a properly made submission means a submission that:

(a) Is made to the Coordinator-General in writing;

(b) Is received on or before the last day of the submission period;

(c) Is signed by each person who made the submission;

(d) States the name and address of each person who made the submission; and

(e) States the grounds of the submission and the facts and circumstances relied on in support of the grounds.

Properly made submissions must be considered by the Coordinator-General alongside the environmental impact statement and other material relevant to the project. Written submissions on the EIS should be provided to:

The Coordinator-General

C/- EIS Project Manager: Townsville Marine Precinct project

Significant Projects Coordination

Department of Infrastructure and Planning

PO Box 15009

City East QLD 4002 Australia

Fax : +61 7 3225 8282

Email : townsvillemarine@dip.qld.gov.au

Submissions received during the submission period, which will be advertised with the release of the EIS for public comment, will be collated by the Department of Infrastructure and Planning and where additional information is required to address the submissions, response requirements will be issued to the proponent, which will be addressed in a supplementary report, as outlined under Section 1.8.3.3 The supplementary report together with the EIS will constitute the final report considered by the Coordinator-General.

1.7 Public consultation process

1.7.1 Overview

Community engagement has informed the development of the EIS. From the outset, community input was sought to inform the EIS studies and to identify community issues and opportunities. Environment and Behaviour Consultants (EBC) were specifically engaged by POTL to work with GHD in this regard.

EBC delivered the community consultation and social impact assessment components of the EIS. EBC has acted as an independent consultant during the consultation process and was bound by POTL protocols and policies. All consultation materials produced throughout the project have been approved and endorsed by POTL. Full details of the community consultation process are included in Appendix E.

Community awareness of the Precinct was already high given its interrelationship with the TPAR project. EBC had involvement in the community consultation process for the TPAR and drew upon their extensive stakeholder database for the Precinct consultation process.

Key stakeholder groups were contacted and the broader community informed through the use of newsletters, letter box drops, targeted interviews and information days. The approach to engagement has facilitated relationship building with stakeholders, which has been maintained throughout the program.

The aim of the community engagement process was to:

- Ensure the community was aware of the EIS process;
- Inform the community about the key components of the EIS and how the EIS would be formulated;
- Provide a range of opportunities for community feedback and input into the EIS; and
- Deliver community feedback to the EIS technical study team to inform the final EIS report.

1.7.2 Stakeholders

At the outset of the project 'community' in the context of the TMPP included property owners, businesses and residents with geographic proximity to the project and those with an interest in the project generally including residents of Townsville, community interest groups, traditional owners, regional industry and businesses, state government agencies and departments, commonwealth authorities and local government.

The suburbs of South Townsville, Railway Estate, Oonoonba and Cluden are located in proximity to the lower reaches of the Ross River. Residents of South Townsville generally have an interest in the activities at the mouth of the Ross River from an employment, recreation and amenity perspective. Residents of the broader Townsville area have an interest in the commercial and employment opportunities relating to marine industries operating from Ross River.

There are a number of marine based industries which operate on the north bank of the Ross River upstream of the future TPAR bridge which may be affected by any restrictions to vessels accessing the river upstream from the bridge. The TMPP provides an opportunity for these businesses to relocate.

These businesses include:

- Townsville Ross River Marina and commercial trawler fleet (marina facilities for the commercial trawler fleet, including a seafood outlet NQ Marine Fresh Seafoods);
- Rosshaven Marine (slipway and hard-stand facility for commercial and recreational vessels, including a chandlery);
- Pacific Marine Group (commercial marine construction and maintenance);
- Riverside Marine (Palm Island barges and Australian Institute of Marine Science (AIMS) research vessels);
- Harbourside Coldstores; and
- Curtain Brothers.

The Australian Defence Force Ten Terminal Regiment also operates from Ross River, as does the Townsville Region Water Police.

There are a number of community groups who have shown an interest in the TMPP from an environmental or community amenity perspective. These include:

- North Queensland Conservation Council;
- Coastal Dry Tropics Landcare Inc.;
- SUNFISH (recreational fishing);

- Commercial Fishers Association;
- Townsville Bird Observers' Club;
- Townsville Local Marine Advisory Group (to the Great Barrier Reef Marine Park Authority);
- Seagrass Watch;
- Wildlife Preservation Society of Queensland (NQ Branch);
- Townsville Wildlife Carers;
- Birds Australia NQ; and
- Sea Turtle Foundation.

River users with a direct interest in the project included:

- Owners and operators of vessels currently occupying pile moorings, including commercial and pleasure-craft;
- Owners and operators of vessels undergoing maintenance and repairs at Rosshaven Marina;
- Owners and operators of vessels located at Fisherman's Wharf;
- Owners and operators of recreational vessels using public boat ramp facilities in both Ross River and Ross Creek (inc. speed boats, jet skis, trailer-sailers);
- Owners and operators of kayaks and other water sports equipment;
- Recreational users of the Benwell Road beach; and
- Townsville Wooden Boat Club.
- In addition to the interest groups identified above, there were also a number of additional key stakeholders with an interest in the project. These included:
- Burdekin Dry Tropics NRM;
- Aboriginal traditional owners; and
- Members of the Port of Townsville's Community Partnerships Forum.

Key project partners for the project are primarily state government agencies and authorities, and local government. These included:

- Townsville Enterprise Limited (TEL);
- Townsville City Council (TCC);
- Queensland Department of Main Roads (QMDR);
- Queensland Rail (QR);
- Queensland Transport (QT);
- Queensland Department of Infrastructure and Planning (DIP); and
- Department of Employment, Economic Development and Innovation (DERM) (formerly Queensland Department of Tourism, Regional Development, and Industry (QTRDI)).

There were also a number of other government agencies and authorities, both state and federal, who have an interest in the project either directly through statutory approval

responsibilities or from an interest in the integrity of adjacent land or marine environments. These included:

- Department of Natural Resources and Environment (DERM) (formerly Department of Natural Resources and Water (NRW);
- Department of Employment, Economic Development and Innovation Queensland Department of Primary Industries and Fisheries (DEEDI formerly DPI&F);
- Queensland Department of Employment and Industrial Relations (DEIR);
- Maritime Safety Queensland (MSQ);
- Queensland Department of Communities (Communities);
- Queensland Department of Local Government, Sport and Recreation (DLGSR) (formerly Queensland Department of Local Government, Planning, Sport and Recreation (DLGPSR));
- Queensland Health (Health);
- Great Barrier Reef Marine Park Authority (GBRMPA);
- Department of Defence (Defence); and
- Commonwealth Department of Environment, Water, Heritage and the Arts (DEWHA).

1.7.3 Methodology

The consultation process will be delivered through two stages which include (i) consultation during the development and preparation of the EIS (November 2008 to March 2009); and (ii) consultation undertaken on the release of the EIS for public comment[3].

The objectives of the community consultation are to:

- Implement a consultation process that was fair, equitable and transparent;
- Build relationships with the community and stakeholders based on trust, openness and respect;
- Provide opportunities for all members of the community to provide meaningful input at appropriate intervals in the EIS;
- Ensure the community (the broader Townsville community and stakeholders, as well as the communities and stakeholders directly affected by the project) are well informed about the TMPP and the EIS. Including the relationship between the TMPP and the broader context of port development and contribution to the regional economy;
- Assist and encourage relevant members of the EIS team to gain an understanding of community issues and concerns with regards to potential social and environmental impacts;
- Facilitate the use of local community knowledge and expertise in the EIS and project design;
- Provide appropriate and timely feedback to participants and the community generally on the outcomes of the consultation process, including how community issues are being used and addressed.

[3] This consultation is yet to occur. Key team members from GHD's and EBC's research teams will partake in this activity. GHD team members are noted under Appendix F.

A number of community involvement techniques were identified and used in the project. These included:

- Dedicated telephone number, website and email address providing information regarding the project, the consultation process and avenues for obtaining further information;
- Project fact sheets which were distributed via mail and email contacts and displayed at public places and on notice boards;
- Project advertorials including newspaper advertisements to advise of details regarding the project and consultation avenues;
- Call cards, which were distributed through door knock consultations and included summary information regarding the project and avenues through which further information could be sought;
- Questionnaires, six of which were issued, targeted at stakeholder groups to seek dedicated feedback on particular issues of concern; and
- Project covering letters to accompany all correspondence.

These techniques were selected as they enabled the consultation objectives to be achieved and facilitated the involvement of the different stakeholder and special interest groups (identified above) in the project. The area doorknocked for targeted one-on-one interviews included the entirety of Boundary Street, Seventh Street and surrounding streets from Victoria Park back towards the Precinct. To capture areas not doorknocked a letter was sent to residents in Cluden, Oonoonba, Railway Estate and South Townsville inviting them to participate in the consultation process.

A separate Indigenous Cultural Heritage Report has been prepared for the EIS by Northern Archaeology Consultancies and Segue Pty Limited. The report presents the results of an indigenous cultural heritage investigation for the TMPP and port expansion development areas at Ross River and Ross Creek. Section 3.15 of this EIS discusses cultural heritage aspects of the Precinct.

Additionally traditional owners requested that they have the opportunity to provide feedback as part of the wider community consultation process for the TMPP. Subsequently EBC prepared a short questionnaire and provided it to the Endorsed Aboriginal Parties. This consultation was undertaken in addition to that included in the development of the Cultural Heritage Management Plan for the Precinct.

Nine responses to the questionnaire were received. This was a 50% response rate by members of the Endorsed Aboriginal Parties. Several traditional owners indicated they did not live locally and therefore should not complete the questionnaire.

At the time of consultation, artist impressions and detailed layouts of the project (as they appear throughout this EIS report) were not available, and an early conceptual diagram was used to assist community and stakeholders visualise the likely layout and footprint of the project (see Appendix E). It is therefore likely that on review of more detailed visual representations of the project, there may be some changes to the type and extent of issues and concerns identified by community and stakeholders to date.

Community and stakeholders will have an opportunity to review artist impressions and more detailed layouts of the project when the EIS report is released for public comment and during the public displays that will be held as part of that process.

Appendix E provides a summary of the materials produced and used throughout the consultation process. It also provides a summary of the consultation methods used for each stakeholder group. Details of all consultations are available on request.

1.7.4 Attitudes towards the TMPP

In general there was some division in the community about the benefits the TMPP would provide to them as residents and the South Townsville area in general.

While 46% of residents were in favour of the TPAR, as they believed there would be some reduction in heavy vehicle traffic on Boundary Street, they were uncertain about the impacts of the TMPP. This was partly due to the belief that the TMPP would affect the recreational opportunities provided by the beach in South Townsville and the belief that South Townsville was already over industrialised.

Another 26% remained uncertain, with much of the uncertainty based around the conceptual design of the TMPP. Without knowing what activities and businesses would be located in the precinct, with little knowledge about the appearance of the precinct and public access to the precinct, it was difficult for most residents to make an informed decision.

There was some acknowledgement of the potential the Precinct could bring in relation to new employment opportunities and increased competition for industry. However resident beliefs about impacts on their lifestyle due to the potential loss of the beach and beliefs about increased pollution and road traffic, often outweighed the positive impacts associated with employment and industry development.

46% of surveyed residents believed the TMPP was “a good idea”. Comments from the 28% of South Townsville residents who did not believe the TMPP was a good idea included:

- Dredging will be terrible. The community use the beach, where is the community good.
- Will increase traffic and can't access the beach.
- Should put in an opening bridge so the beach can be used for tourism. Marine businesses fine tucked away in river.
- Depends what goes in and where. Lots of people I know come to walk their dogs. I would like to see beach stay.
- If it was nice and not commercial I wouldn't mind.
- Rather it not be there, put it around the corner facing north.
- Area is becoming too industrial with associated pollution and noise.
- Not good environmentally or socially. This area is hemmed in by development. For example Palmer St, the port and the V8's.
- Opening bridge would be better. Too much expense for tax payers. Perhaps not right place. Should go on the reclaim near the casino.

- Kills yabbie banks.

Some 26% of residents surveyed were uncertain about the TMPP. Uncertainties were generally based in a lack of knowledge about the facilities the Precinct may provide and the positive and negative benefits on traffic corridors and commerce for the area.

The majority of respondents believed upstream businesses should be provided opportunity to relocate to alternative facilities to avoid impact to industry from the TPAR. Community recreational facilities, eateries and low density residential blocks were preferred development options for upstream lands that would be vacated by relocating industries.

Beach users provided mixed responses with approximately 50% of respondents indicating they "would be upset if they could no longer access the beach". 25% of respondents were uncertain.

There was general acknowledgement that the Precinct facility was to be an industrial commercial area and some suggestions were provided in regards to recreational facilities that may be compatible with the environment, including provision of boardwalks and cafes. Only 25% of residents believed boat ramps should be included in the TMPP. However, 85% of boat ramp users believed boat ramps should be provided in the TMPP to meet current shortfalls of ramp numbers in the Townsville region. The provision of boat ramps is addressed under Section 1.5.1.

Local industries noted concern regarding economic flow on effects for the region if the Precinct was not constructed.

Pile mooring respondents indicated concern about safe shelter locations in the event of severe storms or cyclones with the removal of ability to access upstream in Ross River. A suitably designed breakwater, artificial bank or mangrove area was preferred so as to provide shelter. Other suggestions were to include enough space between buoys to manoeuvre boats in rough or windy conditions and the use of flood netting to prevent debris running into moored boats.

Consultation was undertaken with upstream businesses, with the objective of providing information on the project; receiving feedback about the requirements of businesses in a new precinct and identifying any issues of concern.

Many upstream businesses were concerned about the timing for the development of the TMPP and the need to have sufficient time to relocate their businesses. They were also concerned that businesses had currently not been given an indication they would be relocated into the TMPP and that they may have to compete with other businesses for space within the TMPP. In addition some businesses complained about the accuracy of the information circulated to the public about the TMPP, including issues relating to timing and relocation of businesses.

A full description of all responses and consultations is provided under Appendix E.

1.8 Project approvals

1.8.1 Relevant legislation and policy requirements

This section provides an explanation of the legislation and policies controlling the approvals process for the project. The approval process resulting from the gazettal of this project as a

'significant project' pursuant to the SDPWOA is described and an outline of the linkage to other relevant state and Commonwealth legislation is provided.

The public notification and appeal rights processes are outlined. Local government planning controls, local laws and policies applying to the development are described, and a list is provided of the approvals required for the project and the expected program for approval of applications.

1.8.2 Commonwealth legislation

1.8.2.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBCA)

The *Environment Protection and Biodiversity Conservation Act 1999* is the legislation applicable to developments that may have an impact at the Commonwealth level on matters protected under the Act. The object of the EPBCA is to protect the environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (ecologically sustainable development).

In accordance with the requirements of the EPBCA an approval from the Department of the Environment, Water, Heritage and the Arts (DEWHA) was sought prior to undertaking of any development, as it was determined that the development was likely to have a significant impact (as defined in the Act) on a matter/s of National Environmental Significance (NES). The EPBCA provides automatic protection for World Heritage Properties by ensuring that an Environmental Impact Assessment (EIA) process is followed for proposed actions that will, or are likely to, have a significant impact on World Heritage values of a declared World Heritage property.

The development approval sought takes into account the following Matters of National Environmental Significance, which are expected to be impacted:

- Sections 12 and 15A (World Heritage properties);
- Sections 15B and 15C (National heritage places);
- Sections 16 and 17B (Wetlands of international importance);
- Sections 18 and 18A (Listed threatened species and communities); and
- Sections 20 and 20A (Listed migratory species), of the EPBCA.

Following referral to the DEWHA, the Project was determined to be a "controlled action" requiring a form of environmental assessment (including an EIA) and approval at the Commonwealth level.

On 22 August 2008, the CG declared the Project to be a "significant project" for which an EIS was required according to section 26(1)(a) of the *State Development and Public Works Act 1971* (Qld) (SDPWOA).

The statutory impact assessment process under the SDPWOA is also the subject of a bilateral agreement between the Queensland and the Australian Governments in relation to environmental assessment under the EPBCA. In accordance with the bilateral agreement, this EIS addresses the requirements of both State and Commonwealth legislation.

The Queensland Department of Infrastructure and Planning will manage the EIS assessment process on behalf of the CG.

Matters of National Environmental Significance

The Queensland EIS process is accredited under a bilateral agreement with the Commonwealth therefore, it is necessary to address potential impacts on the matters of national environmental significance that have been identified in the "controlling provisions" for the project. In this case the matters are as follows:

- Sections 12 and 15A (World heritage properties);
- Sections 15B and 15C (National heritage places);
- Sections 16 and 17B (Wetlands of international importance);
- Sections 18 and 18A (Listed threatened species and communities); and
- Sections 20 and 20A (Listed migratory species).

These matters of national environmental significance (NES) are in a stand-alone report included as Section 7. This stand-alone report includes:

- A description of the affected environment relevant to the matters protected including:
  - the current status of the matters protected under the EPBCA, described in sufficient detail, to inform the analysis of the impact from the proposed works on these matters; and
  - for listed threatened and migratory species, a description of the environment including:
    - the current species distribution;
    - relevant information about the ecology of the species (habitat, feeding and breeding behaviour etc);
    - information about any populations of the species or habitat for the species in the area affected by the proposed works; and
    - current pressures on the species, especially those in the area to be affected by the proposed works relevant controls or planning regimes already in place.
- An assessment of relevant impacts and mitigation measures, including:
  - impacts and potential impacts on the matters protected;
  - an analysis of possible mitigation measures for each impact;
  - the relative impacts of alternatives;
  - compensatory measures to offset unavoidable residual impacts; and
  - sufficient justification for all conclusions reached on specific impacts.

The following potential impacts will be addressed in this EIS. The impacts are provided as a guide for specific matters of national environmental significance.

- Impact on listed threatened species (potential impacts vary depending on whether the species is extinct in the wild, endangered or vulnerable):
  - lead to long term decrease in the size of a population;
  - reduce the area of occupancy of the species;
  - fragment an existing population into two or more populations;

- adversely affect habitat critical to the survival of the species;
- disrupt the breeding cycle of a population;
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- result in invasive species that are harmful to the species becoming established;
- interfere with the recovery of the species; or
- consistency with recovery plans.

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

Great Barrier Reef Marine Park Act 1975

Activities which have direct or indirect impacts on the Great Barrier Reef Marine Park (GBRMP) are required under the *Great Barrier Reef Marine Park Act 1975* (GBRMP Act) to obtain a Marine Parks Permit prior to undertaking development. The Great Barrier Reef Marine Park Authority (GBRMPA) considers the *Great Barrier Reef Marine Park Regulations 1983, Sea Dumping Act 1981*, *National Ocean Disposal Guidelines for Dredged Material 2002* and any GBRMPA policies when assessing an application made under the GBRMP Act.

The Townsville Port is excluded from the GBRMP, however should any development within the boundaries of the GBRMP, the GBRMP Act will apply. Despite the Townsville Port exclusion from GBRMP, the GBRMPA has been consulted and informed of progress throughout the planning and investigative stages of the project.

Environment Protection (Sea Dumping Act) 1981

The *Environment Protection (Sea Dumping) Act 1981* (Seas Dumping Act) was enacted to fulfil Australia's international responsibilities under the London Convention of 1972 and has been amended to implement the 1996 Protocol to the London Convention (ratified by Australia in 2001). Under the protocol, Australia is obliged to prohibit ocean disposal of waste materials considered too harmful to the marine environment and regulate the permitted dumping of wastes at sea to ensure that environmental impact is minimised.

The Sea Dumping Act is administered by DEWHA and applies in respect of all Australian waters (other than waters within the limits of a State or Territory), from the low water mark out to the limits of the Exclusive Economic Zone. The Sea Dumping Act regulates the deliberate loading and dumping of waste materials and other matter at sea. It applies to all vessels, aircraft or platforms in Australian waters and to all Australian vessels or aircraft in any part of the sea.

The *National Ocean Disposal Guidelines for Dredged Material* establishes a procedure to determine if material is suitable for unconfined disposal at sea. Only uncontaminated dredged material is deemed suitable for confined disposal at sea.

A sea dumping permit will be required under the *Sea Dumping Act 1981* to enable disposal of dredge spoil from the works associated with the construction of the Project.

Native Title Act 1993

The *Native Title Act 1993* (NT Act) recognises the rights and interests over land and water of Australian Indigenous people in accordance with traditional laws and customs.

The objectives of the NT Act are:

- To provide for the recognition and protection of native title;
- To establish ways in which future dealings affecting native title may proceed, and to set standards for these dealings;
- To establish a mechanism for determining claims to native title; and
- To provide for, or permit, the validation of past acts and intermediate acts, invalidated because of the existence of native title.

A "Native Title Tribunal" has been established in accordance with the provisions of the NT Act. The tribunal prescribes processes for the determination of native title rights and interests over land and water.

During the establishment of the perpetual lease for Lot 773, Native Title was determined to have been suppressed in accordance with the non-extinguishment principle. Provided the existing tenure arrangements (perpetual lease) are maintained, the Project may be carried out and maintained in accordance with the purpose of the lease.

Should the POTL wish to freehold Lot 773, the process will involve surrender of the current perpetual lease and, subsequently, the re-emergence of Native Title rights and interests over the area. Any freeholding application will need to address native title rights and interests under a future act provision of the NT Act, and may involve entering into a Land Use Agreement with relevant indigenous parties.

1.8.3 State legislation

1.8.3.1 State Development and Public Works Organisation Act 1971

The Project has been declared a "Significant Project" under section (26)(1)a of the *State Development and Public Works Organisation Act 1971* (SDPWOA). The CG will facilitate and coordinate the assessment process including an evaluation of the EIS and the preparation of a report. Under the SDPWOA the CG is empowered to make certain recommendations, as well as, to state conditions of approval that must be imposed under certain approval processes.

1.8.3.2 Bilateral agreement

The EPBCA Bilateral Agreement between Queensland and the Australian Government came into effect on 13 August 2004. It is commonly referred to as the Bilateral Agreement however, the full title is *An Agreement between the Australian Government and the State of Queensland*

under Section 45 of the Australian Government Environment Protection and Biodiversity Conservation Act 1999 Relating to Environmental Assessment.

The purpose of the agreement is to avoid assessment process duplications for proposals that:

- are deemed “controlled actions”;
- require assessment under Part 8 of the EPBCA; and
- are undergoing an EIA process under State legislation.

The Bilateral Agreement applies only to three classes of actions, specifically those assessed by an EIS under:

- Chapter 3 of the *Environmental Protection Act 1994*;
- Part 4 of the SDPWOA; or
- Chapter 5, Part 5.8 of the *Integrated Planning Act 1997*.

This Project will require an EIS process under Part 4 of the SDPWOA.

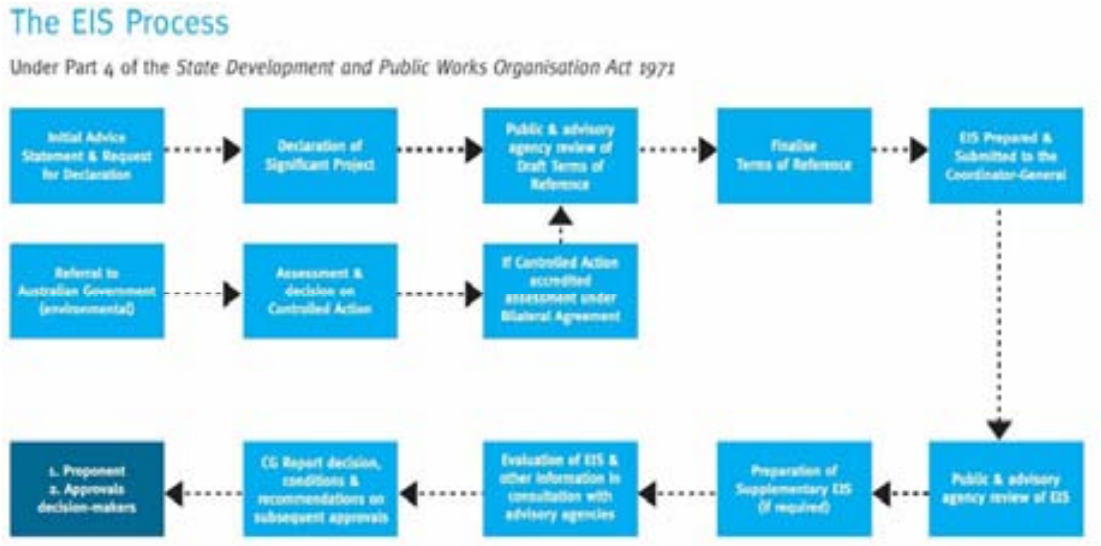
1.8.3.3 EIS under SDPWOA

The process for undertaking an EIS under the SDPWOA is illustrated in Figure 1-12 and outlined below:

1. The environmental impact assessment process for a significant project is commenced by the CG advising the developer that an EIS is required for the project.
2. The CG then prepares and publicly notifies a draft terms of reference for the EIS. During the notification period, comments are invited from the public.
3. To assist in the preparation of the EIS, the CG may also refer the details of the project, the initial advice statement from the developer and the terms of reference to any entity.
4. The EIS prepared by the developer must address the terms of reference to the satisfaction of the CG.
5. If the CG is satisfied with the EIS, the developer must publicly notify the EIS for a period (the submission period) set by the CG, during which a submission may be made by the public.
6. The CG must accept a properly made submission during the submission period.
7. The CG must, after the close of the submission period, consider the EIS, all properly made submissions and any other material the CG considers relevant.
8. The CG must then prepare a report evaluating the EIS and forward a copy of that report to the developer and the Assessment Manager. The report may include conditions which should be imposed on the project.

The EIS for the Project will be submitted to the CG for evaluation and for administering the EIS process. Detailed information in regards to where CG involvement occurs in the IDAS process is detailed under the following sub heading titled *Integrated Planning Act 1997*.

Figure 1-12 The EIS Process



1.8.3.4 Integrated planning act 1997

The Integrated Planning Act 1997 (IPA) forms the legislative framework for the preparation of planning instruments, development assessment (through the Integrated Development Assessment System (IDAS)) and planning dispute resolution in Queensland. The purpose of the IPA is to seek to achieve ecological sustainability by coordinating planning at all levels of government and by managing the development process and the impacts of development.

IDAS allows for the assessment of development proposals by multiple agencies to be integrated into one overall application process. It is a four stage assessment process including:

- Application Stage;
- Information and Referral Stage;
- Notification Stage; and
- Decision Stage.

Not all stages apply to all applications. Schedules 8 and 9 of IPA prescribe certain development types to be assessable, self-assessable or exempt. A development application is triggered under IPA if the proposed development is identified as assessable in Schedule 8 or 9 or the relevant local government's planning scheme (assuming that the development is subject to assessment against the planning scheme).

The IDAS process requires that applications are referred to individual "Referral Agencies" if referral to those agencies is triggered by the characteristics of the proposed development and/or the subject site. A Referral Agency has jurisdiction, relevant to the matter triggering referral, to assess applications, provide advice (if an Advice Agency) and impose requirements or direct refusal (if a Concurrence Agency).

Section 5.8.14 of the IPA sets out how the IDAS process applies for development that is the subject of an EIS as follows:

(a) Where the development application is for a development that is the subject of the EIS, the following apply:

- the EIS and EIS assessment report are part of the supporting material; and
- sections 3.3.6 (Information Request Stage) to 3.3.9 (Referral Agencies advise the Assessment Manager that they have received the applicant's response to the Information Request) and the Notification Stage do not apply; and
- for development requiring impact assessment, a properly made submission about the draft EIS is taken to be a properly made submission about the application; and
- if there is a referral agency, the referral agency's assessment period does not start unless the Chief Executive gives the referral agency the material under section 5.8.13; and
- if there is no referral agency, the decision stage does not start unless the Chief Executive gives the Assessment Manager the material under section 5.8.13; and
- if the application is changed in a way that the development is substantially different, the EIS process starts again for the development.

Material Change of Use

The *State Development and Public Works Organisation Act 1971* (SDPWOA) contains provisions which outline the relationship with the IPA if a proposal triggers an application for Material Change of Use under the IPA and associated legislation (refer to Part 4, Division 4 of the SDPWOA).

The EIS process prescribed by the SDWPO Act replaces the Information and Referral Stage and the Notification Stage of the IDAS process for Material Change of Use applications. At the completion of the EIS process, the CGs Evaluation Report will be taken as being a Concurrence Agency response under IPA and will be provided to the Assessment Manager to consider and incorporate into the Decision Notice.

The above applies only to assessable development.

A material change of use on SPL that is inconsistent with the Port Authority's land use plan is assessable development under Schedule 8 of IPA.

The *POTL Land Use Plan 1996* designates the land proposed for the marine precinct and the breakwater as "*port-dependent Industry*". The purpose of this designation is to provide for:

"uses which are not part of the core port operations as described above but which are intimately associated with and dependent upon being conducted in proximity to the land/sea interface and core port operations. They include stockpiles, granaries, silos and container storage. Facilities included in this category are those which;

- *handle bulk material either sourced by sea transport or dispatched by sea transport*
- *generate such significant sea trade as to positively enhance the usage of the port".*

The Project is consistent with this land use designation as the marine precinct will not provide core port operations but will enhance the usage of the port by relocating existing marine industries, storage for sea transport and opportunities for new marine related industries that will.

The land included in the *Townsville Port Authority Land Use Plan 1996*, may require an application to be made under IPA for a Material Change of Use to allow for the specific proposed uses, however this will need to be confirmed with POTL.

Operational Works

In accordance with section 1.3.5 of the IPA, the following constitutes Operational Works (amongst others):

- tidal works; or
- work in a coastal management district; or
- constructing or raising waterway barrier works; or
- performing work in a declared fish habitat area; or
- removing, destroying or damaging a marine plant.

In terms of Schedule 8A of the IPA, the Chief Executive administering the *Coastal Protection and Management Act 1995* is the Assessment Manager for tidal work or work within a coastal management district for operational work that is:

a) tidal work not in a Port Authority's strategic port land tidal area or in local government's tidal area; or

b) work carried out completely or partly within a coastal management district; and

c) does not involve other assessable development.

In the event of the work being defined as prescribed tidal works, section 3.1.7(3) states the following:

(3) If a local government is the Assessment Manager for development not completely within the local government's planning scheme area—

(a) subsection (1) applies despite the Local Government Act 1993, section 25; and

(b) to the extent the application is for development for prescribed tidal work, the local government has the jurisdiction to assess the application in addition to any other jurisdiction it may have for assessing the application.

The Environmental Protection Agency's Guideline for "Making an Application for Prescribed Tidal Work" identifies that the Assessment Manager for these applications is the relevant local government. In the case under consideration, the proposed works are in the Townsville Port Authority's Area, and immediately adjacent areas, identified as "Strategic Port Land".

In terms of schedule 4A of the *Coastal Protection and Management Regulation 2003,* Prescribed Tidal Work is tidal works that is completely or partly within a local government tidal area. Schedule 10 of the IPA defines a "tidal area" as follows:

***tidal area**, for a local government—*

1 Tidal area, for a local government, means—

(a) to the extent both banks of a tidal river or estuarine delta are in the local government's area, the part of the river or delta below high-water mark that is—

(i) from the mouth of the river or delta as far up the river or delta as the spring tides ordinarily flow and reflow; and

(ii) adjacent to the local government's area; and

(b) to the extent 1 bank of a tidal river or estuarine delta is in the local government's area, the part of the river or delta between high-water mark and the middle of the river or delta that is—

(i) from the mouth of the river or delta as far up the river or delta as the spring tides ordinarily flow and reflow; and

(ii) adjacent to the local government's area; and

(c) if the boundary of the local government's area is the high-water mark or is seaward of the high-water mark—the area that is seaward and within 50m of the high-water mark.

2 Tidal area, for a local government, does not include a tidal area for strategic port land.

***tidal area**, for strategic port land, means—*

(a) to the extent both banks of a tidal river or estuarine delta are part of the strategic port land, the part of the river or delta below high-water mark that is—

(i) from the mouth of the river or delta as far up the river or delta as the spring tides ordinarily flow and reflow; and

(ii) adjacent to the strategic port land; and

(b) to the extent 1 bank of a tidal river or estuarine delta is part of the strategic port land, the part of the river or delta between high-water mark and the middle of the river or delta that is—

(i) from the mouth of the river or delta as far up the river or delta as the spring tides ordinarily flow and reflow; and

(ii) adjacent to the strategic port land; and

(c) if the boundary of the strategic port land is the high-water mark or is seaward of the high-water mark—the area that is seaward and within 50m of the high-water mark.

In accordance with 2(b)(ii) above, the tidal area for strategic port land extends to the middle of the river or delta adjacent to the strategic port land.

In accordance with IPA Schedule 8, Table 2, the Assessment Manager for the application will be POTL because:

- (ref. 2a) The site for the Marine Precinct is completely in a single port authority's strategic port land *(Lot 773 on EP2211*); and
- (ref. 2c) The breakwater *(preferred Option C)* constitutes tidal work partly in a single port authority's strategic port tidal area and in no Local Government tidal area or another port authority's strategic port land tidal area.

Under the *Coastal Protection Act 1995* the proposed works are defined as tidal works. Approval is required for the dredging and disposal of solid waste material in tidal water. The application will require referral to the Department of Natural Resources and Environment (DERM) (formerly Environmental Protection Authority (EPA)) who will assess the proposed development against the *Coastal Protection and Management Act 1995* (Coastal Act) and the provisions of the State Coastal Management Plan – Queensland's Coastal Policy (2001) and relevant regional coastal management plans.

The application for tidal work must be lodged with POTL as Assessment Manager for the TMPP. The application will trigger referral to the following Referral Agencies:

- Department of Natural Resources and Environment (DERM) as Concurrence Agency.
- Department of Employment, Economic Development and Innovation Queensland Primary Industries and Fisheries Queensland Primary Industries and Fisheries (DEEDI, formerly DPI&F) as Concurrence Agency.
- Department of Infrastructure and Planning (DIP) as Advice Agency.

Other Development

Other development made assessable through Schedule 8 also applies on SPL. This includes, for example, a material change of use for an Environmentally Relevant Activity (ERA) or operational works for clearing native vegetation on freehold land (unless the clearing is an exception under Part 1, Schedule 8). Reconfiguration of a lot on SPL is exempt development.

Land Act 1994

The Department of Natural Resources and Environment (DERM) administers the *Land Act 1994* (Land Act). The object of the Land Act is to ensure that land to which the Act applies is managed for the benefit of the people of Queensland. The Land Act applies to all land, including land below high-water mark.

In terms of section 9(1) of the Land Act, all land below high-water mark, including the beds and banks of tidal navigable rivers —

(a) is the property of the State, unless the land is inundated land or a registered interest in the land is held by someone else; and

(b) may be dealt with as unallocated State land.

Section 126 of the Land Act states:

126 Strategic port land

(1) If land above high-water mark is needed as strategic port land for a port authority, the port authority may be given, without competition, either a lease or deed of grant.

(2) However, if land below high-water mark is needed as strategic port land for a port authority, the port authority may be given, without competition, only a lease.

Section 127 of the Land Act addresses land tenure for reclaimed land as follows:

127 Reclaimed land

(1) If a person has reclaimed land under the authority of an Act—

(a) the Governor in Council may issue to the person, without competition, a deed of grant over all or part of the land; or

(b) the Minister may issue to the person, without competition, a lease over all or part of the land.

(2) When granting the reclaimed land, the Governor in Council or Minister may amalgamate the land granted with an adjoining tenure held by the person.

(3) If the reclaimed land is already held under lease, the lease must be surrendered before a new lease or deed of grant is issued.

(4) If a deed of grant or lease is issued over only part of the reclaimed land, the rest of the land must be dedicated as a reserve or a road.

(5) If the reclaimed land is dedicated as a reserve and the person who reclaimed the land wishes to be the trustee of the reserve, the Minister must appoint the person as the trustee.

(6) If a deed of grant is issued, the purchase price is—

(a) the purchase price stated in the permission to reclaim the land or in the lease; or

(b) if no purchase price is stated—the amount of the unimproved value of the land, on the day the permission to reclaim the land was given, decided by the Minister.

(7) The person may appeal against the Minister's decision on the amount of the unimproved value.

At least part of the subject site is currently below the high-water mark and thus owned by the State.

In its current state, the land below the high-water mark to be developed may be given to POTL under lease only.

Prior to the application being made for Resource Allocation, application must be made to lease the unallocated State land.

Once the land is reclaimed, POTL can apply for ownership of the land. However, section 127(3) of the Land Act requires that the lease must be surrendered before a deed of grant can be issued if the reclaimed land is held under lease.

Environmental Protection Act 1994

The Environmental Protection Agency administers the *Environmental Protection Act 1994* (EP Act). The objective of the Act is to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (*ecologically sustainable development*).

The EP Act, together with the IPA, provides a licensing and approval regime for a range of Environmentally Relative Activities (ERAs). A regulation may prescribe an activity, other than a mining activity, as an environmentally relevant activity if the Governor in Council is satisfied that:

- a contaminant will or may be released into the environment when the activity is carried out; and
- the release of the contaminant will or may cause environmental harm (refer to Sections 18 and 19).

The 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 are also required to have a development permit approval for the activity, unless a code of environmental compliance applies to the activity. Development permit approvals are granted under the IPA.

Levels of Environmentally Relevant Activities

There are two levels of ERAs:

- ERAs with an aggregate environmental score (AES) are considered to present a higher risk to the environment. There is an annual fee based on the AES for these ERAs.
- ERAs without an AES are considered to present a lower risk to the environment. There is a set annual fee for these ERAs.

ERAs (excluding mining and petroleum activities) are required to have obtained development approval or a code of environmental compliance (where one has been approved for a particular ERA or certain aspects of a particular ERA) and a registration certificate. This will be achieved through the process outlined in the EP Act and the *Environmental Protection Regulation 2008*.

Environmental Protection (Noise) Policy 2008

The object of the Environmental Projection (Noise) Policy 2008 (Noise EPP) is to fulfil the objective of the *Environmental Protection Act 1994*.

The development of the Precinct is likely to generate noise throughout the construction and operational phases of the development and dredging activities. As a result, the development of the Precinct will need to adhere to the requirements outlined under the Noise EPP and the *AS 2436-1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites*.

Specifically, the following sections are key reference points that are addressed by the Project:

- Section 11 – Acoustic quality objectives;
- Part 3 – Evaluation procedure and the approval of a Draft EMP;
- Part 4 – Measures for noise nuisance control;
- Part 6 – Procedures for noise assessments; and
- Schedules 1 and 3 – Planning levels for particular noise generating works.

Environmental Protection (Air) Policy 2008

As with the Noise EPP, the object of the Environmental Protection (Air) Policy 2008 (Air EPP) is to fulfil the object of the *Environmental Protection Act 1994*. The policy seeks to achieve this through the identification of environmental values to be protected or enhanced, specify air quality indicators and provide a framework for decision-making.

Specific obligations currently prescribed under the Air EPP that will be applicable to future development within the Precinct include:

- Section 8 – Air quality indicators;
- Section 9 – Air quality goals;
- Part 3 – Environmental management decisions;
- Part 4 – Management of certain sources of contamination; and
- Schedule 1 – Air quality indicators and goals.

Environmental Protection (Water) Policy 1997

The Environmental Protection (Water) Policy 1997 (Water EPP) aims to fulfil the object of the *Environmental Protection Act 1994* by identifying environmental values for Queensland waters, providing water quality guidelines and objectives, efficiently and equitably using water recourses, promoting best practice environmental management, and promoting community responsibility and involvement.

Unless prior approval is obtain, as outlined in Sections 31(3) or 32(2), the Water EPP prohibits the release of the following items into a roadside gutter, stormwater drain or a water; or in a place where it could reasonably be expected to move or be washed into a roadside gutter, stormwater drain or a water, and result in a build-up of sand, soil, silt or mud in the gutter, drain or water:

1. rubbish;
2. scrap metal, motor vehicle parts, motor vehicle bodies or tyres;
3. building waste;
4. sawdust;
5. solid or liquid waste from an on-site domestic waste water treatment system;
6. cement or concrete;
7. a degreasing agent, paint, varnish or paint thinner;
8. any manufactured product, or any by-product or waste from a manufacturing process, that has a pH less than 6 or greater than 9;
9. an insecticide, herbicide, fungicide or other biocide;
10. oil;
11. stormwater run off; and
12. sand, soil, silt or mud.

Environmental Protection (Waste Management) Policy 2000

The Environmental Protection (Waste Management) Policy 2000 (Waste EPP) provides a strategic framework for managing waste in Queensland. The objectives of the Waste EPP are achieved through establishing a preferred waste management hierarchy and principles for achieving good waste management, to be applied by both industry and government. The waste management hierarchy provides a framework for prioritising waste management practices to

achieve the best environmental outcome. The hierarchy, from the most preferred to the least preferred method, is: waste avoidance; waste reuse; waste recycling; energy recovery from waste; and waste disposal.

The principles for achieving waste management objectives include:

- The polluter pays principle - all costs associated with waste management should be borne by the waste generator, including the costs of minimising the amount of waste generated, containing, treating and disposing of waste, and rectifying environmental harm;
- The user pays principle - all costs associated with the use of a resource should be included in the price of goods and services (including government services) developed from the resource; and
- The product stewardship principle - the producer or importer of a product should take all reasonable steps to minimise environmental harm from the production, use and disposal of the product.

The required contents of a Waste Management Program are outlined in Sections 18-21 of the Waste EPP. It is likely that a Waste Management Program will be required as a condition of an ERA licence.

The dredging operation associated with the development is classified as an Environmentally Relevant Activity (ERA) under the *Environmental Protection Regulation 2008* of the EP Act. The proposed dredging associated with the development is classified as ERA 16.

In accordance with changes to the *Environmental Protection Regulation 2008* legislation (in force as of 1 January 2009), port authorities are no longer exempt from requiring approval to undertake dredging. POTL will be required to make an application for ERA 16.

The Project may also trigger assessment of other ERAs as set out under Schedule 1 of the *Environmental Protection Regulation 2008*. These may include for example ERA 16 Extractive and screening activities. The operational phase of the development may require the assessment of ERAs such as ERA 49 Boat maintenance or repair, ERA 17 Abrasive blasting etc. Obtaining approval for these ERAs will become the responsibility of the developer of individual sub lessees.

Aboriginal Cultural Heritage Act 2003

The DERM administers the *Aboriginal Cultural Heritage Act 2003* (The ACH Act). The ACH Act binds all persons, including the State, to provide effective recognition, protection and conservation of Aboriginal cultural heritage.

Aboriginal cultural heritage is defined under Section 8 of the ACH Act as anything that is:

- A significant Aboriginal area in Queensland; or
- A significant Aboriginal object; or
- Evidence of archaeological or historic significance, of Aboriginal occupation of an area in Queensland.

Section 14 of the ACH Act denotes that as far as practicable, Aboriginal cultural heritage should be owned and protected by Aboriginal people with traditional or familiar links to the cultural heritage if it is comprised of any of the following:

- Aboriginal human remains;
- Secret or sacred objects; or
- Aboriginal cultural heritage lawfully taken away from an area.

In accordance with Sections 87, 88 and 89 of the Act requires the development of a Cultural Heritage Management Plan if:

- An EIS is required;
- An environment authority is required under a different Act; or
- Under the IPA, a development application is made for the project or the Chief Executive is a concurrence agency.

The requirements of a Cultural Heritage Management Plan (CHMP) and the assessment process are outlined in Part 7 of the Act.

As the Project requires an EIS, a CHMP has been developed in accordance with Section 87 of the ACH Act. The CHMP prepared for the Project was approved by NRW on 23 December 2008.

Coastal Protection and Management Act 1995

Overview

The *Coastal Protection and Management Act 1995* (Coastal Act) repealed the *Harbours Act 1955,* the *Canals Act 1958* and the *Beach Protection Act 1968*. The Coastal Act includes provisions to continue permissions and approvals given under the superseded coastal legislation. Assessable development within tidal areas is likely to trigger assessment of the development under the Coastal Act in circumstances such as the disposal of dredge material within tidal areas or construction within tidal areas.

The DERM administers the Coastal Act. The main objects of the Act are to—

(a) provide for the protection, conservation, rehabilitation and management of the coast, including its resources and biological diversity; and

(b) have regard to the goal, core objectives and guiding principles of the National Strategy for Ecologically Sustainable Development in the use of the coastal zone; and

(c) provide, in conjunction with other legislation, a coordinated and integrated management and administrative framework for the ecologically sustainable development of the coastal zone; and

(d) encourage the enhancement of knowledge of coastal resources and the effect of human activities on the coastal zone.

Coastal Management Plans

Coastal Management Plans, Coastal Management Districts and other legislative instruments are used to achieve “co-ordinated and integrated management and administrative framework”.

Coastal management plans:

- Identify principles and policies for coastal management;

- Identify key coastal sites and coastal resources in the coastal zone; and
- Plan for the long term protection or management of key coastal sites and resources.

Coastal Management Plans are developed in a consultative process including opportunities for public notification and seeking submissions from the public. The preparation of these plans are also undertaken specifically, with regard to the traditions and customs of Aboriginal and Torres Strait Islander people affected by the plans.

The State Coastal Management Plan – Queensland's Coastal Policy (State Coastal Plan) 2002 was prepared by the Minister in accordance with Section 30 of the Coastal Act. The State Coastal Management Plan is discussed further in Section 1.8.4.1. The State Coastal Plan deals with matters of international, national and state significance. Under Section 35 of the Coastal Act, the Minister is also required to:

- Prepare regional Coastal Management Plans to provide direction for the implementation of the State Coastal Plan; and
- Identify Coastal Management Districts in each region.

Coastal Management Districts are areas requiring special development controls and management practices.

Regional Coastal Management Plans must describe how the coastal zone is to be managed and identify the Coastal Management Districts. Regional Coastal Management Plans implement the State Coastal Management Plan's policy framework at the regional level and identify key coastal sites requiring special management within the region. The Queensland coastline has been divided into eleven regions. With the Precincts project area being within the Dry Tropical Coast region. The Dry Tropical Coast region extends from the northern boundary of Townsville City Council to the southern boundary of the former Bowen Shire. The region incorporates the local government areas of Townsville City Council, Palm Island Shire Council, Burdekin Regional Council and part of Whitsunday Regional Council.

The subject site is located within the area to be covered by the yet to be completed Dry Tropical Coast Regional Plan. Therefore, the proposed works are only currently subject to the provisions of the State Coastal Plan, which also has effect as a State Planning Policy under the IPA.

Removal of Quarry Material

The removal of quarry material from State coastal land below high water mark in a Coastal Management District is regulated by a resource allocation (Chapter 2, Part 5, Division 1) and a Dredge Management Plan (Chapter 2, Part 5, Division 2). The removal of quarry material below high water mark incorporates all types of dredging activity, including extractive industry dredging, capital dredging associated with some form of tidal works and maintenance dredging. Applications for these works are assessed by DERM against criteria listed in section 75 of the Coastal Act, the State Coastal Plan and the relevant regional Coastal Management Plan. An allocation notice or an approved Dredge Management Plan authorises the holder, during the period the notice or plan is in force, to access quarry material (refer to Section 100 of the Coastal Act).

In addition, operational work involving the disposal of dredge spoil or other solid waste material in tidal water, carried out completely or partly within a Coastal Management District, is deemed

assessable development under the IPA (Schedule 8). The DERM is the Assessment Manager for these applications and an assessment is made against the provisions of the Coastal Act, the State Coastal Management Plan and the relevant Regional Coastal Management Plan.

Tidal Works

The proposed development is not defined as Prescribed Tidal Work in schedule 4A of the Coastal Act. This is because Prescribed Tidal Works exclude:

- Tidal works that will be used for port authority operations or a public marine facility constructed by or for Queensland Transport or a port authority; and
- Tidal works for creating or changing the configuration or characteristics of a navigational channel.

The subject site (Lot 773 on EP 2211) is identified as “Strategic Port Land” in the current *Townsville Port Authority Land Use Plan (1996)* (TPALUP). The area proposed for location of the breakwater is located to the east POTL reclamation area described as Lot 791 on EP2348 in the mouth of the Ross River. This land is described Strategic Port Land under the TPALUP.

Townsville City Council’s *City Plan 2005* indicates that “Strategic Port Land” is ”not subject to Planning Scheme”. Therefore, “Strategic Port Land” is not subject to a local government planning scheme. As the identified location for the Precinct is identified as “Strategic Port Land”, the proposed works will be assessed against the relevant provisions of the TPALUP by the POTL as Assessment Manager. The breakwater adjoins SPL and is within 50m of SPUL and, accordingly, POTL will also act as the Assessment Manager for works related to the breakwater. An application to undertake tidal work will be assessed by the POTL in accordance with the relevant procedural requirements of the Integrated Development Assessment System (IDAS).

Dredging

The proposed works will trigger either a quarry material allocation notice or a Dredge Management Plan under Chapter 2, Part 5 of the Coastal Act. A dredging ERA approval or approval of an Operator’s License will be required.

Land reclamation

The application to dispose of material in tidal water will form part of the application for tidal works. If the DERM is not the Assessment Manager for the application, the application will be referred to the DERM as a concurrence agency. The DERM will assess the proposed disposal of dredge spoil against the provisions of the Coastal Plan.

Transport Infrastructure Act 1994

Queensland Transport administers the *Transport Infrastructure Act 1994* (TI Act). The overall objective of the TI Act is to provide a regime that allows for and encourages effective integrated planning and efficient management of a system of transport infrastructure.

In order to provide this regime, land needs to be managed by a land use instrument that will make development assessable or at least provide codes for self-assessable development.

Therefore, the TI Act requires POTL, to have an approved Land Use Plan over the Port Land in place that outlines proposed operational works or tidal works, reclamation, change of use for

buildings and excavation permits. The TPALUP is such documentation. A new Land Use Plan is currently under preparation and is expected to be completed by the end of 2009. It is considered that the proposed works are consistent with the TPALUP and the Draft Review of the Port Land Use Plan.

Fisheries Act 1994

The DEEDI (formerly DPI&F) administers the *Fisheries Act 1994* (FA). The FA provides for the management, use, development and protection of fisheries resources and fish habitats, and the management of aquaculture activities. The FA includes provisions for the following:

- Taking, causing damage to or disturbance to marine plants, including mangroves;
- Works in a declared fish habitat;
- Waterway barrier works; and
- Tidal water, fresh and marine aquaculture operations.

In accordance with Schedule 8 of the IPA, operational works for the purposes of the above activities under the *Fisheries Act 1994* is assessable development. As a result, development approvals for the above activities are required under the IPA.

The proposed works are likely to result in the disturbance of marine plants and therefore requires assessment against the FA. Therefore, when the application for tidal works is lodged, the proposal will be referred to the DEEDI as a referral agency.

Water Act 2000

The DERM administers the *Water Act 2000* (Water Act). The Water Act provides a regime for the licensing, regulation and management of water resources in Queensland. The Water Act requires requisite licences (and/or development approvals under the Schedule 8 of IPA) be obtained for the purposes of all or some of the following:

- Artesian bores;
- Water pipelines;
- Pumping stations;
- Ground level storage sites; and
- Treatment plants.

All work that may interfere with or impact on watercourses, particularly within the bed and banks, must comply with the requirements of the Water Act and, as necessary or desirable, will also be discussed with DERM.

Under section 266 of the Water Act, any activities involving excavation or the destruction of vegetation in a watercourse require a permit. In deciding such an application, the DERM considers the type and location of the vegetation, the effect of the activity on the watercourse and the reason for the proposal, among other things.

A watercourse is defined as:

> *"1 Watercourse means a river, creek or stream in which water flows permanently or intermittently—*

(a) in a natural channel, whether artificially improved or not; or

(b) in an artificial channel that has changed the course of the watercourse; but, in any case, only—

(c) unless a regulation under paragraph (d), (e) or (f) declares otherwise—at every place upstream of the point (point A) to which the high spring tide ordinarily flows and reflows, whether due to a natural cause or to an artificial barrier; or

(d) if a regulation has declared an upstream limit for the watercourse—the part of the river, creek or stream between the upstream limit and point A; or

(e) if a regulation has declared a downstream limit for the watercourse—the part of the river, creek or stream upstream of the limit; or

(f) if a regulation has declared an upstream and a downstream limit for the watercourse—the part of the river, creek or stream between the upstream and the downstream limits."

The Precinct reclamation will occur on tidal lands adjacent to the mouth of the Ross River. Dredging activities will occur in the channel adjacent to the Precinct reclamation area and for construction of the Precinct and breakwater in the mouth of the Ross River. DERM will need to be consulted for a decision on whether this constitutes that works for the project are in a watercourse.

No marine vegetation is expected to be influenced during any construction activities and it is unlikely that this project will meet any major obstacles under the Water Act. Measures should be implemented during construction works to address issues such as sedimentation and erosion.

Vegetation Management Act 1999

The *Vegetation Management Act 1999* (VMA), in conjunction with the IPA, regulates the clearing of native vegetation excluding grasses and mangroves. The VMA is administered by DERM. Under the IPA, operational works are defined as, in part, clearing vegetation, including vegetation to which the VMA applies. Schedule 2 Table 2 of the *Integrated Planning Regulation 1998* (IP Reg) requires that operational work that is the clearing of native vegetation be assessed against the provisions of the *Vegetation Management Act 1999*.

As the Project involves the reclamation of land there is unlikely to be any clearing of vegetation. However, some vegetation clearing may be required as part of the construction of any road or access way. DERM would assess any clearing required for the proposed works against the relevant Regional Ongoing Clearing Code. Only the clearing of remnant vegetation (native vegetation that occurs in a mapped Regional Ecosystem (RE), or that meets the structural and species requirements to be mapped as a RE) will be assessed under this process (non-remnant vegetation can be cleared under this VMA without a permit).

The *Fisheries Act 1994* is concerned with the protection and management of the State's marine and freshwater fish resources, inclusive of their habitats. Clearing marine plants, including plants in tidal areas will be assessed by DPI&F as part of the application for tidal works.

Nature Conservation Act 1994

The DERM administers the *Nature Conservation Act 1992* (NCA).

Under section 73 (a) of the NCA, the DERM is required to conserve wildlife and its values to:

- Ensure the survival and natural development of the wildlife in the wild; and,
- Conserve the biological diversity of the wildlife to the greatest possible extent; and,
- Identify reduce or remove, the effects of threatening processes relating to the wildlife; and,
- Identify the wildlife's critical habitat and conserve it to the greatest possible extent.

Any activity that may have the potential to impact on wildlife or its values in an area may be seen as a threatening process, and will be referred to the DERM as part of the development approval process. In particular, the effect of the project on Endangered, Vulnerable, or Rare wildlife, or the habitat on which that wildlife depends will be of interest to the DERM in regard to their obligations under section 73 of the NCA.

Wild Rivers Act 2005

The *Wild Rivers Act 2005* (WR Act) provides a higher level of environmental protection for rivers that have all or almost all of their natural values intact. The Minister is responsible for declaring "Wild Rivers" for protection under the WR Act.

The proposed works will not impact on any rivers declared as "Wild Rivers" under the WR Act.

1.8.4 Planning processes and standards

1.8.4.1 State planning policies

State Coastal Management Plan

The State Coastal Management Plan - Queensland's Coastal Policy 2002 (the State Coastal Plan) is a statutory instrument under section 29 of the *Coastal Protection and Management Act 1995* (Coastal Act) and has the effect of a State Planning Policy under the IPA. The plan operates in conjunction with other policies and instruments of the Coastal Act and the IPA.

The proposal must have regard to the State Coastal Plan, more particularly the principles and policies of the ten (10) management outcomes. These management outcomes include:

- Coastal Use and Development;
- Physical Coastal Processes;
- Public Access to the Coast;
- Water Quality;
- Indigenous Traditional Owner and Cultural Resources;
- Cultural Heritage;
- Coastal Landscapes;
- Conserving Nature;
- Coordinated Management; and
- Research and Information.

The State Coastal Plan has been discussed further in Section 1.8.3.

The ten management outcomes of the State Coastal Plan and their relevance to the Project are discussed further below.

Coastal Use and Development

- 2.1.1 Areas of state significance (social and economic)

The policy applies to the areas neighbouring or adjoining areas of state significance (social and economic). Strategic Port land is considered an area of state significance.

This policy requires that "*the integrity and functioning of 'areas of state significance (social and economic)' are maintained and protected from incompatible land uses and activities that may adversely affect the continued use of these areas*".

This policy does not apply to the development as the land is the type of land use that this policy is designed to protect as is demonstrated by the designation of Strategic Port Land and is being developed as a port related industry.

- 2.1.2 Settlement pattern and design

This policy applies to the *coast*, existing *urban areas* on the *coast*, or new *urban areas* containing *coastal resources* and their values.

This policy requires that "*the coast is conserved in its natural or non-urban state outside of existing urban areas and urban growth is managed to protect coastal resources and their values by minimising adverse impacts*".

The proposed development is to be developed on strategic port land and on land designated as future strategic port plan in an area already heavily developed for port related industry. It is also being developed on land that has been reclaimed under existing approvals and therefore the natural state of the coastal area has been altered. Further, the footprint of the breakwater has been configured to minimise adverse environmental impacts (refer Breakwater Options Section 1.5.3). It is therefore considered that the development is consistent with this policy.

- 2.1.3 Coastal-dependent land uses

The policy applies to the land on and neighbouring the *foreshore* and land containing *coastal resources* and their values.

This policy requires that when:

> "*planning for appropriate land uses in areas adjoining the foreshore, adequate provision needs to be made for coastal-dependent land uses. Where there is competition for available land, preference should be given to necessary coastal-dependent land uses ahead of other urban land uses.*
>
> *Planning for the location and design of new coastal-dependent land uses outside of existing coastal townships should be undertaken so as to avoid or minimise adverse impacts on coastal resources and their values".*

The proposed development is to be developed on strategic port land for a port related use. It is therefore considered that the development is consistent with this policy as the Precinct is a coastal dependent land use.

- 2.1.4 Canals and dry land marinas

A dry land marina is defined as "*a marina created by the excavation of land above high water mark.*"

The development of a canal or dry land marina is not proposed as part of this Project. It is therefore considered that this policy does not apply to this development.

- 2.1.5 Maritime infrastructure

This policy requires "*that maritime infrastructure (such as ports) have an important role in the state's economy and is appropriate where there is a demonstrated public need, no net loss of public access to the coast (in accordance with policy 2.3.1) and adverse impacts on coastal resources and their values are avoided where practicable, or minimised*"

It is considered that the location of the Project on Strategic Port Land is a compatible land use for the subject site and is consistent with this policy as it consolidates port related industry in one area.

The public access aspects of this policy are detailed further in Policy 2.3.1 Public Access.

- 2.1.6 Extractive industry

This policy requires that "*the economic value of particular coastal resources to the development industry and other industries is recognised. Any extraction activities are to be appropriately located and sustainably managed so as not to compromise relevant coastal management outcomes and principles*".

Dredging, including capital works for construction, is considered an extractive activity. Other than dredging, the TMPP will not involve any extractive activities or industries other than dredging. For the TMPP to proceed dredging is required of areas including the Ross River channel and Lot 773. Dredging and construction assessments completed for this EIS have determined the minimum required dredging activities to enable the project to proceed. These activities and strategies for minimising impact to coastal resources are described under Section 2.4.6.

The biodiversity values of the areas to be effected by dredging have been determined under Section 3 of this EIS and under Section 5 (economics) an ecosystem services assessment has determined the economic value of the coastal resources that will be effected by construction of the TMPP. Dredging activities proposed to enable the TMPP to proceed, further addressed under Section 2.1.8 below, will not negatively affect the regional coastal values of the Townsville region and are considered to be consistent with this policy.

- 2.1.7 Mining and petroleum activities

This policy requires that "*when assessing mining and petroleum activities (including exploration activities) in the coastal zone under the Environmental Protection Act 1994, the relevant decision-maker is to consider the State Coastal Plan and any relevant regional coastal plan*."

This policy will not apply as the TMPP does not involve a Mining and petroleum activity.

- 2.1.8 Dredging

This policy requires that the "*dredging from land below highest astronomical tide (e.g. within coastal waters) provides navigational and economic benefits to Queensland, and is to be*

appropriately located and sustainably managed to avoid or minimise adverse impacts on coastal resources and their values".

Assessment of dredging activities required for the TMPP has been addressed in detail under Section 2.4.6. In summary dredging activities determined as required for the operational efficacy of the TMPP involve:

- Deepening of the existing levels to accommodate required shipping channels, berth pockets and a swing basin;
- Provision of a navigable area to accommodate pile moorings; and
- Removal of any soft sediments below rock revetment and breakwater footprints.

The shallow nature of the environment and material to be dredged is likely to require use of a mechanical Backhoe Dredge for the majority of dredging works. A proportion of dredge material has been identified as geotechnically suitable for reclaim and a Cutter Suction Dredge may be the appropriate plant for this activity.

Navigational benefits will be realised for access to the facility as a result of construction dredging works. Impacts on the state and local economy resulting from the TMPP have been assessed and are provided under Section 5 of this document. In brief, economic benefits are expected from the TMPP as it will provide an alternative location from which industries being negatively affected by the bridge construction could operate in conjunction with providing an opportunity for expansion of maritime construction industries in the Townsville region.

To meet policy requirements required dredging activities will be minimised to reduce any potential for environmental harm as a result of this activity. The proposed dredging will be undertaken using an approved Dredge Management Plan to ensure adverse impacts on coastal resources and their values are avoided or minimised and are sustainably managed.

- 2.1.9 Reclamation

This policy requires that:

> *"land below the highest astronomical tide is maintained in its natural state. It may only be reclaimed where:*
>
> *(a) it is necessary for erosion control or beach nourishment purposes;*
>
> *(b) it is necessary for protecting the natural environment and its processes;*
>
> *(c) it is for coastal-dependent land uses or other 'areas of state significance (social and economic)' and there is a demonstrated net benefit for the state or a region;*
>
> *(d) it is necessary for the operation of a port or harbour;*
>
> *(e) it is necessary for the development of a public or private facility and there is public support and a demonstrated public benefit from the proposal;*
>
> *(f) it is necessary to reinstate land that has been eroded; or*
>
> *(g) it is for reclamation within a canal or marina.*
>
> *For (c), (d) and (e) above, it needs to be demonstrated that there are no alternative sites available that do not require reclamation.*

For (f) above, reclamation should be undertaken in a coordinated manner with neighbouring properties also subject to erosion.

Reclamation of tidal waters creates adverse impacts on coastal resources and their values and therefore requires clear justification and the avoidance or minimisation of such adverse impacts.

The Project will require the reclamation of lands on Lot 773 on EP2211 (Benwell Road beach - approximately 34 hectares (ha)). This reclamation is consistent with point (c) of this policy as it is required for the development of coastal dependent land uses and provides a net social and economic benefit for the region, as noted under Sections 4 and 5 of this EIS (social and economic respectively). Lot 773 is designated as Strategic Port Land and has long been identified as the only available site within the Townsville region (refer Section 1.4) for placement of an industrial marina facility to provide services to existing and potential businesses.

Construction assessments conducted under this EIS (refer Section 2.4) have identified procedures to minimise adverse impacts on coastal resources and their values. Reclamation is required to facilitate construction of the Precinct. The social impact assessment conducted as part of this EIS has articulated that upstream marine industries and businesses may be forced to close or relocate beyond the Townsville region if the TMPP is not provided as an alternative location to existing facilities. This stems from impacts to business operational capability resulting from closure of the Ross River by development of the TPAR and that no alternative suitable site for the TMPP is available within the Townsville region. The economic assessments conducted as part of this EIS have articulated that failure to provide the TMPP as a relocation site for existing industries will have a net negative effect on the economy of the Townsville region through direct (loss of marine industry) and indirect (flow-on) effects.

Development of the project will address the ongoing and increasing demand for marine facilities in the region by providing a sheltered, purpose-built precinct for the collocation of similar marine dependant industries and public facilities currently spread around Ross Creek and South Townsville.

- 2.1.10 Tourism and recreational activities

This policy requires that:

"*the diversity and quality of recreational and tourism opportunities are maintained while ensuring that the coastal resources and their values, upon which these experiences rely, are protected.*

When planning for tourism and recreation, facilities and services such as waste treatment and access need to be designed to be capable of meeting projected peak demand. New tourist or recreational developments must be compatible with the coastal landscape values of the area and be of a scale that does not result in a significant impact on coastal resources and their values. Consideration also needs to be given to allow for a diversity and balance of tourism and recreational opportunities".

Maritime fabrication industries will be located within the TMPP and may service or supply marine tourism vessels or recreational craft. The facility will not be a destination port for tourism or recreational vessels and will provide waste management services of relevance only to vessel maintenance requirements. The TMPP will, therefore, be consistent with the intent of this policy.

- 2.1.11 Rural land uses

This policy requires that "*rural land uses are sustainably managed to maintain their important economic role in Queensland, as well as to protect coastal resources and their values, particularly coastal waters and wetlands*".

This policy will not apply as the Project does not involve rural land uses.

- 2.1.12 Managing water resources

This policy requires that "*in assessing an application for an authorisation to take water from a watercourse or to construct infrastructure that will interfere with the flow of water in the watercourse (for example, dams, weirs and tidal barrages), regard must be had to the effects of the proposal on coastal ecosystems and coastal processes*".

Hydrological, sediment transport and wave and coastal process investigations have been undertaken as part of this EIS and are documented under Section 3.8. Studies have demonstrated that the project will not negatively impact on the flow of water in the Ross River, flushing capability of the mouth of the Ross River or sedimentation patterns within the local area.

- 2.1.13 Fishing

This policy requires that "*the ecological health and economic and social value of the fisheries resource is protected through careful management of fishing activities, particularly in terms of the protection of endangered or vulnerable species, nursery grounds and feeding areas*".

Section 3.10 of this EIS provides detailed assessment of the marine biodiversity of the area to be impacted by the TMPP. Areas considered of high importance for support of fisheries resources (in particular seagrass meadows and mangroves) will not be affected by the TMPP. The small fringe of mangroves at the rear of Lot 773 is likely to be reclaimed as part of the road, rail and services corridor for the TPAR, not the TMPP.

Studies have demonstrated that loss of benthic habitats associated with reclamation of Lot 773 will not negatively affect regional biodiversity and of any species considered to be food sources for other fishery species. Some benthic habitats will be created through construction of the offshore breakwater and external rock revetments, and may act as fish refuges. Some social fishing opportunities will be lost through reclamation of Lot 773 (refer Section 4), however, consideration will be given to provision of alternative recreational opportunities through inclusion of public access areas on the Precinct (eg fishing from external revetments) and through inclusion of public access facilities on upstream lands made available through industry relocation to the Precinct. The TMPP is therefore considered to be consistent with the values identified in this policy.

- 2.1.14 Aquaculture

This policy requires that "*aquaculture on the coast will be located and undertaken in a manner that results in no significant adverse impacts on the coastal resources and their values*".

This policy will not apply as the Project does not involve the development of aquaculture activities in the region.

Physical Coastal Processes

- 2.2.1 Adaptation to climate change

This policy requires that:

> *"Knowledge and understanding of greenhouse issues and climate change impacts should be improved amongst the public and private sectors with the aim of setting the foundation for cost effective adaptation measures. The four target areas are: avoidance of development on vulnerable areas; improved knowledge and understanding of climate change; assessments of impacts and vulnerability; and incorporating adaptation strategies into coastal planning and management".*

A climate change impact assessment and adaptation study have been conducted as part of this EIS. Those are detailed under Section 3. Information from those studies has influenced the reference design to reduce the breakwater footprint and avoid construction and impacts upon sensitive wading and migratory bird habitats. Through the climate adaptation studies information on potential sea level changes has provided support for design considerations of an appropriate reference level and construction approach to minimise possibility of the Precinct being inundated within its operational design life. Understanding of potential climatic risks and threats to the development has been developed enabling incorporation of that knowledge into design and management strategies to minimise impacts and this study is, therefore, in accordance with this policy.

- 2.2.2 Erosion prone areas

This policy requires that "*to the extent practicable, erosion prone areas are to remain undeveloped apart from acceptable temporary or relocatable structures for safety and recreational purposes*".

Lot 773 on which the Precinct will be developed is Strategic Port Land. The subject site is located within the area to be covered by the yet to be completed Dry Tropical Coast Regional Plan. Therefore, the proposed works are only currently subject to the provisions of the State Coastal Plan, which also has effect as a State Planning Policy under the IPA. The Port of Townsville (including the area covered by Lot 773) and the upstream industrial sites do not have any specified erosion prone area distances provided on the Erosion Prone Area Plan (SC3391). Therefore, the erosion prone area for both the above areas is determined by Clause 2(i) of the plan that specifies that the erosion pone area is

> "a line measured 40 metres landward of the plan position of the mean high water springs (MHWS) tide level except where approved revetments exist, in which case the line is measured 10 metres landward of the upper seaward edge of the revetment, irrespective of the presence of outcropping bedrock".

Given that the current Port landward boundary is identified by approved revetments, and that formal approval would be sought for the external revetment for a reclaimed Lot 773, the landward boundary of the erosion prone area for the Port is assumed to be 10 m landward of the upper seaward edge of the revetment. Along the banks of the Ross River upstream of the mouth where there is an approved revetment, the landward boundary of the erosion prone area would extend to 10 m landward of the upper seaward edge of the revetment. Because much of

the upstream land is currently occupied by existing marine industry the erosion prone area would be 10 m from the edge of the revetment or 40 m if there is no approved revetment.

Construction and operation assessments conducted as part of this EIS have included a 10 m buffer in their assessments to provide impact assessment against a reference design that minimises development of erosion prone environs. The reference design, and assessments undertaken for this EIS, are therefore in accordance with this policy. Detailed design of the Precinct will be referred to DERM to assess concurrence with policy 2.2.2.

Lands located upstream from Lot 773 within Ross River may be redeveloped following relocation of the occupying industries to the Precinct. Redevelopment of these lands will also need to account for erosion potential. In relation to setback distances for any infrastructure in the redevelopment of the existing marine industry areas, the following scenarios are possible:

- If the land is to be reconfigured, DERM may require the surrender to the State of all or part of the land in the erosion prone area as a condition of their concurrence response. This process resets the property boundaries, which would then form the basis of any other setback requirements under planning legislation that may be required; alternatively
- If the land is subject to a material change of use application, the DERM will be triggered as a concurrence agency provided the associated redeveloped building development > 1000 square metres, and may apply setbacks to ensure that any development is not in the erosion prone area with justification based on the various policies in the State Coastal Management Plan.

Upstream lands are currently industrial sites and are likely to have some approved revetments, jetties and seawalls. Following surrender and remediation they will likely be proposed for redevelopment into mixed residential / commercial consistent with the Townsville City Plan. As this will trigger a material change of use application any development application will be referred to DERM for consideration of any setbacks or land surrender that may be required.

- 2.2.3 Shoreline erosion management

This policy specifies that:

> "*Regional coastal management plans will identify any priority areas for erosion management.*
>
> *These areas will be taken into account when considering:*
>
> *(a) applications for renewal or conversion of leases for leasehold land on the coast;*
>
> *(b) issuing any approvals for coastal protection works; and*
>
> *(c) assessing applications for funding proposals for coastal management programs*".

Lot 773 and the upstream lands linked to the Precinct development are located in the dry tropics of Queensland in Townsville. A regional coastal management plan has yet to be developed for this coastal area and in the absence of that approved management plan the policy default for shoreline erosion management is the defined Erosion Prone Area policy of the State Coastal Management Plan. As such, in the case of the Precinct, shoreline erosion management is to be given due consideration under the policy noted above in Section 2.2.2.

- 2.2.4 Coastal hazards

This policy requires that:

> "*When determining new areas for urban land uses on the coast, an evaluation is to be carried out to identify the level of potential risk to life and property from coastal hazards. This evaluation should be based on mapping of storm tide hazard areas in addition to considering the impact of physical coastal processes, including any impacts from potential sea level rise.*
>
> *Development in areas on the coast identified as having a risk of being affected by coastal hazards needs to be carefully considered and wherever possible, be retained undeveloped. Where areas vulnerable to storm tide inundation have been developed, further development in these areas needs to address: u its vulnerability to sea level rise and storm tide inundation; and the proposed access to and protection of evacuation routes.*
>
> *In such areas, local government should have in place counter-disaster plans to address these coastal hazards.*

A detailed coastal processes assessment has been conducted as part of this EIS and is provided as Section 3.8 of this document. Assessment has determined that development and operation of the Precinct will not unduly effect coastal processes including flushing, sediment transport and wave dynamics in the coastal areas associated with the Precinct footprint. Hydrodynamic and wave modelling studies supported selection of the breakwater design configuration to minimise potential for impacts on the coastal habitats from ambient and under storm conditions. Further opportunities to minimise operational impacts have been identified and articulated within the project specific Environmental Management Plan. These include strategies for hazardous material storage that mitigate against spills and environmental harm, opportunities to mitigate against wave inundation under severe storms (cyclones) and sea level rise scenarios and evacuation strategies to maintain safety in emergency situations. The studies and their findings clarify that the development and operation of the Precinct is, therefore, in accordance with this policy.

- 2.2.5 Beach protection structures

This policy requires that:

> *"Construction of structures for the purpose of beach protection (including artificial reefs, banks, wrecks, breakwaters and groynes) in coastal waters will only be approved where:*
>
> *(a) there is a demonstrated need in the public interest; and*
>
> *(b) comprehensive investigation has been carried out and it can be demonstrated that:*
>
> *(i) there would not be any significant adverse impacts on the longshore transport of sediments; and*
>
> *(ii) there would be no increase in coastal hazards for the neighbouring foreshore".*

To be functional the Precinct will require opportunity to berth vessels for in water servicing and maintenance and to slip vessels for out of water maintenance. Berth areas for mooring and provision are also necessary. To meet this need the outer quayline of the Precinct and the swing basin and channel approach to the Precinct must provide safe operational conditions

under a range of wind, wave and tidal conditions. A detailed assessment was undertaken as part of the studies for this EIS to develop an appropriate design configuration for the Precinct breakwater. This included consideration of environmental, hydrodynamic and wave impacts under a range of breakwater configurations as well as consideration of the effects on the Precinct quayline of not constructing a breakwater. The wave tranquillity of the Precinct quayline was not within safe operational requirements without inclusion of a breakwater and the breakwater is considered necessary for safe vessel operation for the Precinct quayline.

The breakwater configuration assessment selected a design that provided little to no impact upon the longshore transport of sediments in comparison to existing conditions and upon the existing hydrodynamic regime of the Ross River mouth. Studies have demonstrated that, adopting the mitigation strategies identified within this EIS, construction and operation of the Reference Design Precinct will not have any adverse impacts upon the neighbouring foreshore as long as the detailed design process gives due consideration to reference levels under different climate scenarios. Environmental benefits from the selected breakwater configuration may include:

- Restriction westward of longshore sediment transport into the Ross River navigation channel and a reduced requirement to dredge the Ross River channel in the longer term;
- Provision of an effective barrier between the common use areas and the sensitive environmental areas to the east; and
- Provision of an opportunity for sand to accrete on the eastern side of the breakwater to provide an alternative migratory bird roosting and nesting area.

The Precinct Reference Design, including the breakwater, and the studies against it are therefore considered to be in accordance with this beach protection policy.

Public Access to the Coast

- 2.3.1 Future need for access

This policy requires that:

> *"There is no net loss of public access to the foreshore or of public useability of coastal waters. This is to be maintained, protected and enhanced where the provision and operation of infrastructure of state economic significance and protection of coastal (natural and cultural) resources is not compromised".*

The Project area includes Lot 773 and areas on the eastern side of Ross River. Lot 773 is reclaimed land currently comprising a sandy beach margin with mudflats exposed at low tide. This area is held under perpetual lease by POTL and is identified as Strategic Port Land. The public has been allowed to access the beach and mudflats for recreation purposes until such time as the land is required for Port related purposes such as construction of an industrial marine precinct. Current uses include fishing, yabbying, walking and dog exercise. These are detailed further under the social impact assessment section of this study (refer Section 4).

The TMPP will form an industrial marine facility within which maritime fabrication, boat maintenance and commercial barge operations will occur. This will include the use of forklifts, trucks, operational cranes for heavy lifting, welding, abrasive blasting and other machinery. The facility will, as appropriate, be bound by workplace health and safety regulations including required use of Personal Protective Equipment such as hard hats, eye protection, work boots

and ear protection for the safety of employees. Public access to the full operational facility may be unsafe and, therefore, inappropriate.

To maintain public access to the coast, consideration is being given to inclusion of areas within the Precinct that may be open to the public. This may include opportunity for direct purchase from seafood suppliers or provision of access points along the external face of the rock revetment. The detailed design of the Precinct will need to address these considerations against the safe operation of the Precinct facility and the safety of the public.

Upstream industrial lands may be vacated by industries relocating to the Precinct. The desired planning outcome of the redevelopment of any upstream lands will be to provide enhanced public access to the coast that offsets losses experienced through development of the Precinct. These upstream lands are currently inaccessible to the public because they are working commercial sites. When they are redeveloped in accordance with any approval from Council it is anticipated that increased opportunities for public access and recreation will be provided e.g. riverside boardwalk, seafood sales outlet, possible fishing locations and potentially a fenced dog exercise area in the existing environmental park.

At this point it cannot be guaranteed that redevelopment of upstream lands will be able to replace all existing public access opportunities. However POTL will endeavour to provide alternative recreation opportunities as identified above.

An Aboriginal Cultural History storyboard will be located at the environmental park that recognises the significance of the area to Indigenous Traditional Owners. Information on the importance of the mangroves and mud flats within the area may also be included to educate public users of the importance of these environs to recreational and commercial fisheries.

- 2.3.2 Design of access

This policy requires that:

> "*The design of access to the coast or along the foreshore and any associated facilities is to meet the following criteria:*
>
> *(a) maintain the long-term stability of dunes or other types of landforms;*
>
> *(b) avoid alteration to tidal regimes and coastal processes;*
>
> *(c) minimise impacts on coastal resources, particularly disturbance to coastal wetlands, other coastal habitats, protected species, and significant habitats including wildlife nesting and breeding areas (such as for turtles and shorebirds);*
>
> *(d) minimise damage to island substrate from anchor damage;*
>
> *(e) avoid routes that pass through or have an adverse impact on sites of cultural significance, except where such access is in keeping with the values of the site; and*
>
> *(f) provide appropriate signposting of access ways*".

A Reference Design for the Precinct, which includes an offshore breakwater, has undergone detailed assessment as part of this EIS study for its potential to impact existing hydrodynamic regimes, coastal processes, flushing, sediment transport, impacts to natural systems and the biodiversity they support (including avifauna and megafauna) and transport regimes. Transport access corridors have, in particular, been assessed against proposed development of the TPAR

and strategies to mitigate against identified impacts, such as disturbance to nearby residential areas during construction of the Precinct, have been identified. Assessment has determined that development and operation of the Precinct will not unduly affect coastal processes, transport corridors or natural systems. Adoption of the proposed breakwater configuration, in particular, reduces potential to impact upon wading and migratory birds by avoiding critical habitat. Use of the TPAR access route following its completion will greatly reduce any transport impacts upon nearby sensitive receivers and, as such, staged construction of the Precinct to minimise development prior to completion of the TPAR is appropriate. The studies, their findings and proposed mitigation strategies clarify that the development and operation of the Precinct is, therefore, in accordance with this policy.

- 2.3.3 Coastal road network

This policy requires that "*the coastal road network is planned to minimise impacts on coastal resources and their values*".

The proposed Townsville Marine Precinct will continue to be accessed via Benwell Road, a locally controlled road currently under jurisdiction of POTL. The two-lane bitumen sealed road provides the main access to the Port. A new access intersection from Benwell Road will be constructed as part of the Benwell Road/Port Access Road interface.

The Project does not require the development of new roads other than local roadways within the Precinct itself to enable vehicular access to all Precinct facilities.

- 2.3.4 Vehicle use on beaches

This policy requires that "*plans that address vehicle use on beaches, including regional coastal plans, will determine long-term levels of use that provide for public access and safety while ensuring that the coastal resources and their values are protected*".

The Project does not involve vehicle use on beaches and therefore this policy does not apply.

Water Quality

The coastal management outcome for water quality under the State Coastal Plan requires that "*water quality in the coastal zone to be maintained at a standard that protects and maintains coastal ecosystems and their ability to support human use*".

There are six policies for water quality under the plan, these include:

- 2.4.1 Water quality management;
- 2.4.2 Wastewater discharges to coastal waters;
- 2.4.3 Waste-disposal facilities;
- 2.4.4 Stormwater management;
- 2.4.5 Groundwater quality; and
- 2.4.6 Acid sulfate soils.

Detailed investigations of water and sediment quality undertaken to support this EIS have demonstrated that the water quality within the vicinity of the Precinct has elevated levels of nutrients. Potential acid sulfate soils have been determined to be present in approximately 70% of the area of the development footprint, including areas proposed for dredging. Potential re-use

of dredged material for reclamation will, therefore, require consideration of acid sulfate treatment and management options.

Groundwater levels within fill material placed in Lot 773 are likely to be influenced by tidal fluctuations and by rainfall events. Existing shallow groundwater is saline and of relatively poor condition with elevated concentrations of dissolved metals and ammonia. Given that groundwater quality does exceed the water quality guidelines for surrounding surface waters, any groundwater extracted as part of excavation dewatering operations will require treatment to meet acceptable levels prior to discharge. Migration of groundwater is likely to be predominantly from the west, however, there is potential for saline waters to affect the integrity of foundations and infrastructure within Lot 773. This should be considered during the detailed design phase.

Construction and operation activities have the potential to impact upon the local water and sediment quality and strategies to mitigate against these impacts appropriate to the TMPP have been developed. These include waste water and stormwater management recommendations, recommendations for water quality management during dredging and reclamation works and management strategies for potential acid sulfate soils. These are discussed in detailed under the EMP developed for the project to appropriately manage and mitigate any impacts upon water quality in accordance with the Water EPP. If suggested management strategies are adopted it is expected that the project will meet the six water quality policies under the State Coastal Plan.

Indigenous Traditional Owner and Cultural Resources

The coastal management outcome for Indigenous Traditional Owner and Cultural Resources under the State Coastal Plan requires that **"***the living culture of Indigenous Traditional Owners and their connection with cultural resources within the coastal zone is valued and continues for future generations of Indigenous Traditional Owners*".

There are two policies for Indigenous Traditional Owner and Cultural Resources under the plan, these include:

- 2.5.1 Areas of state significance (Indigenous Traditional Owner cultural resources); and
- 2.5.2 Involvement of Indigenous Traditional Owners in managing their cultural resources.

Lot 773 is not an area of state significance for Traditional Owner cultural resources and this policy, therefore, does not apply in that regard. The Precinct site and upstream lands targeted for redevelopment lie along the Ross River, which is considered to have cultural importance to local Traditional Owners (refer Section 3.15). Accordingly, a project specific Cultural Heritage Management Plan has been developed for the construction and operation stage of the Project in accordance with Section 87 of the ACH Act. The CHMP prepared for the Project was approved by DERM on 23 December 2008.

Cultural Heritage

The coastal management outcome for Cultural Heritage under the State Coastal Plan requires "*that places, buildings and objects with important cultural heritage values located on the coast are appreciated, conserved, managed and passed on to future generations"*.

There are two policies for Cultural Heritage under the plan, these include:

- 2.6.1 Areas of state significance (cultural heritage)

- 2.6.2 Cultural heritage

A project specific Cultural Heritage Management Plan has been developed for the construction and operation stages of the Project. The CHMP prepared for the Project was approved by DERM on 23 December 2008. The cultural heritage importance of lands associated with development and operation of the TMPP have been assessed under Section 3.15 of this study. Although a number of sites of importance occur within the South Townsville area none are directly linked to the TMPP. The project is not expected to impact upon any of the identified areas of significance and, therefore, this policy is not triggered.

Coastal Landscapes

- 2.7.1 Areas of state significance (scenic coastal landscapes)

This policy discusses incorporating areas of state significance into regional coastal plans and planning schemes.

> *"In preparing regional coastal plans, 'areas of state significance (scenic coastal landscapes)' are to be identified and their diversity, quality and extent of scenic landscape values are to be recognised and protected.*
>
> *The preparation of regional planning strategies and local government planning schemes for areas that include 'areas of state significance (scenic coastal landscapes)' as identified by regional coastal plans, are to include measures that protect areas with coastal landscape values from incompatible land uses.*
>
> *Where 'areas of state significance (scenic coastal landscapes)' have not been identified by a regional coastal plan, regional planning strategies and planning schemes are encouraged to protect scenic landscape values from incompatible land uses".*

In the absence of a regional plan the default policy document for coastal landscape is the State Coastal Management Plan. Under Schedule 2 of that Plan Townsville is noted as an area of 'high scenic management priority'. The area proposed for the Townsville Marine Precinct and breakwater (Lot 773 and Lot 791) are identified as Strategic Port Land in the current (1996) Port Land Use Plan. Townsville City Council City Plan 2005 designates Strategic Port Land as 'not subject to Planning Scheme'. However, to address how the Precinct may impact upon the scenic values of the Townsville region a landscape character and visual impact assessment was conducted as part of this EIS (refer Section 3.3 and Appendix N).

The project site is located within an area that has existing industrial development including both port and land based activities. While individual impacts may have a minimal impact on the visual landscape, the cumulative impact is a continuing industrialised landscape within this area. This is particularly the case with the additional land reclamation. The project will alter the surrounding landscape and the visual experience of the receptors. However, these changes must be seen within the context of the existing local environment. The new works are co-located within the existing port and industrial development therefore it is not considered to be a new element in the visual outlook. The assessment of impacts is considered to be of moderate significance. A strategy for minimising these impacts that could be considered during the detailed design phase of the TMPP would be to reduce the size of worksheds below the proposed reference height as far as practically possible to minimise the visual impact of these facilities.

- 2.7.2 Other coastal landscape values

This policy requires that:

> *"When assessing landscape values, the importance of coastal landscapes to the state and regional community is to be addressed. In particular, the relevant Indigenous Traditional Owner communities are to be involved in the assessment of landscape values (refer to policy 2.5.2).*
>
> *In addition to policy 2.7.1, which focuses on scenic values of coastal landscapes of state significance, regional coastal plans will assess the following:*
>
> *(a) for areas identified as 'areas of state significance (scenic coastal landscapes)' — other coastal landscape values such as cultural and spiritual values that are of state or regional importance;*
>
> *(b) for areas not identified as 'areas of state significance (scenic coastal landscapes)' — the importance of coastal landscape character and associated values; and*
>
> *(c) the coastal landscapes' sensitivity to development and change.*
>
> *Investigations into landscape values will be undertaken as part of the preparation of regional coastal plans to identify the values identified in this policy. Other relevant and current landscape studies for the region will be identified and used in these investigations.*
>
> *Regional planning strategies and local government planning schemes for coastal areas should protect areas with state and regionally important coastal landscape values, identified by regional coastal plans, from incompatible land uses.*
>
> *Where state and regionally significant coastal landscape values have not been identified by a regional coastal plan, regional planning strategies and planning schemes are encouraged to protect coastal landscape values that are consistent with this policy".*

A regional plan does not exist for Townsville. Consistent with this policy relevant aspects of this EIS study have discussed with Traditional Owners. Efforts have been made to reduce impacts to coastal landscape values, including reducing the breakwater footprint, in forming the reference concept design. Landscape values of the Project Area have been assessed as part of a visual impact assessment, forming part of this EIS. Detailed assessment of the landscape character is provided under Section 3.3 and within Appendix N. Construction of new land within Ross River to add to the existing port facilities and construction of the breakwater will increase the extent of this type of landscape within the local area. As the works will be co-located within the existing industrial area of Townsville this development is considered in accordance with the existing landscape character of the local area.

Conserving Nature

- 2.8.1 Areas of state significance (natural resources)

This policy requires that "*land identified to be developed in the future for urban, maritime and rural land uses in regional plans, planning schemes and port land use plans is to be located outside of 'areas of state significance (natural resources*)".

The area proposed for the Townsville Marine Precinct and breakwater (Lot 773 and Lot 791) are identified as Strategic Port Land in the current (1996) Port Land Use Plan. Townsville City

Council City Plan 2005 designates Strategic Port Land as 'not subject to Planning Scheme'. It is therefore concluded that the Project does not interfere with an area of State Significance. The areas targeted for development have, however, been assessed under this EIS as to their value as a coastal resource in a regional and local context. Ecological studies (refer Section 3.10) note that there are no Regional Ecosystems of concern within the study area and that any terrestrial vegetation associated with the study area is fragmented and degraded with a high incursion of weed species. No terrestrial animals of conservation concern were detected in the study footprint.

A number of wading and migratory birds of international conservation importance were noted in the mouth of the Ross River adjacent to the project footprint. This site was acknowledged as an area of regional significance for these species and this area has been deliberately excluded from the project footprint to reduce potential impacts upon these species. Similarly, the benthic habitats in Cleveland Bay near the project footprint are also acknowledged to be of importance for marine species vulnerable to anthropogenic impacts and of high conservation value, including turtles, dugong and dolphins. Impact mitigation measures have been identified for any perceived risks to these species and are detailed under Section 3.10 of this document. If identified mitigation measures are adopted it is considered this project will not negatively impact the regional value of coastal resources.

- 2.8.2 Coastal wetlands

This policy requires that "*further loss or degradation of coastal wetlands is to be avoided and impacts on coastal wetlands prevented, minimised or mitigated (in order of preference)".*

The policy addresses matters that are relevant to the conservation and management of Queensland's coastal wetlands, including land within 100m of a coastal wetland.

The Precinct footprint on Lot 773 is adjacent to mangrove communities that support significant wading and migratory birds among other fauna. To avoid potential to impact upon this area the biodiversity it supports the breakwater footprint has been set offshore disconnected to land.

The Bowling Green Bay Ramsar wetland area is located approximately 10 km southeast of Townsville and is listed on the Department of Environment, Water, Heritage and the Arts, '*Directory of Important Wetlands*'. Under this directory the Project area falls adjacent to the Ross River Reservoir (QLD008) and Bowling Green Bay (QLD002) (www.environment.gov).

Wetlands south and east of the Ross River are designated as being within an Area of State Significance (natural resources) by virtue of their listing within the Queensland chapter of the '*Directory of Important Wetlands*' in Australia. The Precinct footprint falls within Strategic Port Land, which also holds social and economic significance for the State. If a use or activity has the potential to adversely affect this area, it must demonstrate an overriding net benefit for the State as a whole. Because of the considerable distance from the Ramsar wetland to the project area the Project is not expected to have an effect on the Ramsar area and it will provide social and economic benefits to the region and state.

- 2.8.3 Biodiversity

This policy requires that "*biodiversity on the coast is to be safeguarded through conserving and appropriately managing the diverse range of habitats including coral reefs, seagrass, soft*

bottom (benthic) communities, dune systems, saltflats, coastal wetlands and riparian vegetation".

The biodiversity and natural values of the Precinct footprint and adjunct habitats have been assessed under this EIS. Ecological studies (refer Section 3.10) note that there are no Regional Ecosystems of concern within the study area and that any terrestrial vegetation associated with the study area is fragmented and degraded with a high incursion of weed species. No terrestrial animals of conservation concern were detected in the study footprint.

A number of wading and migratory birds of international conservation importance were noted in the mouth of the Ross River adjacent to the project footprint. This site was acknowledged as an area of regional significance for these species and this area has been deliberately excluded from the project footprint to reduce potential impacts upon these species. Similarly, the benthic habitats in Cleveland Bay near the project footprint support seagrasses and are acknowledged to be of importance for marine species vulnerable to anthropogenic impacts and of high conservation value, including turtles, dugong and dolphins.

Within the direct footprint of the Precinct and breakwater soft sediment benthic taxa occur. Potential impacts to assessed biodiversity from construction and operation of the Precinct have been determined and mitigation measures have been identified for any perceived risks to these species. Potential offsets for impacts, including removal of benthic taxa, that cannot be mitigated against have also been suggested. If suggested measures are adopted it is considered this project will not negatively impact the regional biodiversity values.

- 2.8.4 Rehabilitation of coastal resources

This policy requires that "*rehabilitation of degraded coastal areas and resources is encouraged. For existing activities in the coastal zone, a proactive voluntary approach to rehabilitation working in partnership with landholders, community groups (such as catchment management), local government (including Aboriginal Councils and Island Councils) and local Indigenous Traditional Owner groups is supported. The priority for rehabilitation is the restoration of degraded coastal ecosystems to their natural ecological, physical and aesthetic condition'*.

POTL has recently undertaken rehabilitation of a disused (Sun Sun) aquaculture facility on the banks of the Ross River upstream from the Precinct location. In accordance with this policy POTL will also undertake rehabilitation of upstream lands vacated by relocating industries to a standard appropriate for redevelopment. Discussions with indigenous groups in relation to this EIS have provided avenues for including signage on rehabilitated lands that are publicly accessed to provide information in regards to Aboriginal cultural heritage of the sites. Any such activities will be undertaken through continued consultation and involvement with the endorsed Aboriginal parties. All rehabilitation works will be in accordance with the Environmental Management Plan that accompanies this EIS.

- 2.8.5 Pest species management

This policy requires that:

> *"The focus of pest management activities is on minimising the risk of introducing new pest species and reducing or at least controlling the impact of pest species infestations. Management of pest species will have regard to:*

- *preventing the introduction, establishment and spread of pest species in the coastal zone; and*
- *managing the impacts of existing and new pest species".*

Terrestrial vegetation adjacent to the Precinct footprint has been identified as fragmented and degraded with a high incursion of weed species (refer Section 3.10 of this document). Mitigation strategies suggested under this EIS to minimise the risk of spreading weed species during construction include the use of wash down facilities. Rehabilitation of degraded lands not associated with the Precinct through removal of weed species is also noted to assist in controlling reinfestation. No marine pest species were detected during the aquatic studies and the Precinct is not identified to be a first port of call for international vessels requiring quarantine clearance. Strategies to avoid introduction of marine pests during the construction and operation of the Precinct are suggested under Section 3.10, including adherence to international ballast management requirements. If strategies identified in this EIS are adopted it is suggested the project will be in accordance with this policy.

Coordinated Management

The coastal management outcome for Coordinated Management is "*coordinated management is coordinated and integrated across all levels of government and within the community*".

There are five policies for Coordinated Management under the plan, these include:

- 2.9.1 Regional coastal management plans;
- 2.9.2 Coordinated management of jurisdictions;
- 2.9.3 State land on the coast;
- 2.9.4 Private use of State land on the coast; and
- 2.9.5 Control districts.

These policies deal with the coordination and implementation of the State Coastal Plan into regional and local planning documents. A Whole of Government (WoG) working group established by POTL has been engaged during all phases of this project from prior to commencement to reporting of findings and provides an avenue through which management is coordinated and integrated across levels of government. In addition to meetings with the WoG group a number of additional consultation events have occurred during the life span of this project to enable interactive discussions with relevant regulatory agencies on the activities being conducted under the TMPP EIS process. A summary of these is provided as Table 1-3.

Table 1-3 Summary of Government consultation activities during the TMPP EIS process

Date Briefing	to	Location	Purpose
14/11/07	DIP/CoG Dept	Brisbane	To brief DIP officers on the upcoming projects (Marine Precinct and Port Expansion) and to flag POTL's intention to seek Major Project status for each project.
21/11/07	Whole of Government (State)	Townsville (DTRDI Boardroom)	To brief State Agencies on upcoming projects (Marine Precinct and Port Expansion)
3/3/08	GBRMPA	Townsville (GBRMPA)	To brief GBRMPA on upcoming projects (Marine Precinct and Port Expansion)
12/3/08	DEWHA	Canberra (DEWHA office)	To brief DEWHA on upcoming projects (Marine Precinct and Port Expansion)
27/8/08	Whole of Government (State)	Townsville (POTL)	To brief State Govt agencies on the EIS process for the Marine Precinct and introduce the EIS team (GHD, EBC).
9/10/09	DEWHA	Canberra (DEWHA)	To brief DEWHA on the findings of the EIS to date and the process for selecting a commercial developer for the Marine Precinct.
15/10/08	DIP/CoG Dept	Brisbane (DIP)	To provide an update on the findings of the EIS.
1/12/08	Whole of Government (State and C'Wealth)	Townsville (DIP)	Presentation to WoG participants on the Marine Precinct project to coincide with release of draft Terms of Reference for public comment.
4/12/08	GBRMPA	Townsville (POTL)	To brief GBRMPA on the findings of the EIS investigations to date, an accelerated Berth 12 project and to conduct initial discussions about the possibility of locating a new capital dredge spoil disposal area in the Marine Park.
10/12/08	Whole of Government (State)	Brisbane (DIP)	Presentation to WoG participants on the Marine Precinct project to coincide with release of draft Terms of Reference for public comment.
5/3/09	Whole of Government (State)	Townsville (POTL)	To provide an update on the findings of EIS investigations to date and on the process for

Date Briefing	to	Location	Purpose
			selecting a commercial developer for the Marine Precinct.
11/3/09	Whole of Government (State)	Brisbane (DIP)	To provide an update on the findings of EIS investigations to date, on the process for selecting a commercial developer for the Marine Precinct and on the local issue of recreational boat ramps.
12/3/09	DEWHA	Canberra (DEWHA office)	To brief DEWHA on the findings of the EIS investigations to date and the full suite of major projects underway at POTL. Also to conduct initial discussions about the possibility of locating a new capital dredge spoil disposal area in the Marine Park.

Research and Information

The coastal management outcome for Research and Information is "*research programs, and data and information collection and management focus on, support and enhance effective coastal management*".

There are three policies for Research and Information under the plan, these include:

- 2.10.1 Information management;
- 2.10.2 Inter-agency coordination; and
- 2.10.3 Monitoring.

These policies principally deal with the coordination of data management by government departments. POTL is a GOC and has entered, as appropriate, into arrangements with relevant other agencies to share information for the benefit of projects associated with the TMPP including the TPAR, Townsville Ocean Terminal Project and Townsville City Council sand resource study. POTL is also supporting a collective investigation into the possible expansion of boat ramp facilities within the Townsville region. The approach adopted by POTL is aimed at enhancing coastal management outcomes for all relevant projects and is, therefore, in accordance with this policy.

SPP 1/92 – Development and Conservation of Good Quality Agricultural Land

The purpose of State Planning Policy 1/92 for the Development and Conservation of Good Quality Agricultural Land (GQAL) is to provide local government with guidelines to consider GQAL issues in planning assessments. In order to assist in determining the suitability of land for future development, four agricultural land classes have been developed.

The project will be developed on reclaimed land designated as Strategic and Future Strategic Port Land. The subject site does not contain GQAL and State Planning Policy 1/92 is not relevant to the proposal.

SPP 2/02 – Planning and Managing Development involving Acid Sulfate Soils

State Planning Policy 2/02 – Planning and Managing Development involving Acid Sulfate Soils is concerned with the development of low-lying coastal areas below 5 metres AHD potentially containing Acid Sulfate Soils (ASS).

These soils may be found close to natural ground level but could also be found at depth in the soil profile. ASS generally overlie potential ASS horizons, but both may also occur within the same layer and may not be mutually exclusive.

The SPP applies to development that would result in:

- The excavation of, or otherwise removing, 100 cubic metres or more of soil or sediment from areas below 5 metres AHD; or
- Filling of land involving 500 cubic metres or more of material with an average depth of 0.5 metres or greater.

DERM assess potential ASS issues as a Referral Agency during the development assessment process.

SPP 2/02 requires the identification, assessment and management of soils in Local Government Areas listed in Annex 1 of the SPP2/02 where:

The natural surface elevation of the site is below 20 mAHD;

- More than 100 m^3 of soil is proposed to be excavated below 5 mAHD (Dear *et al.* 2004); and/or
- Placing 500 m^3 or more of fill material with an average depth of 0.5 m or greater.

The proposed development site is State Government-owned on lease to POTL, is not encompassed within local government planning schemes and does not therefore fall under SP2/02. However, the potential exists for the disturbance of PASS and/or AASS material as part of the development and therefore identification, assessment and management of such soils is still required.

Based on the results of the ASS investigation undertaken as part of this EIS, the following recommendations were made with regard to the development of the site:

- Given the identification of PASS in samples obtained across the Marine Precinct site, an ASS Management Plan (ASSMP) will be required in accordance with Queensland Acid Sulfate Soils Management Committee Guidelines (2002) specific to site development, in addition to the ASSMP prepared as part of the EIS, and may require the incorporation of additional sampling for ASS; and
- To minimise the potential for environmental harm, all of the material disturbed as part of the development should be assumed to be PASS and managed accordingly, unless more detailed assessment, either pre- or post- dredging and placement, can confirm the material is non-ASS. This includes the need for potential offshore disposal of all material to limit the potential for oxidation and acid generation.

SPP 1/02 - Development in the Vicinity of Certain Airports and Aviation Facilities

State Planning Policy 1/02 - Development in the Vicinity of Certain Airports and Aviation Facilities sets out broad principles for protecting airports and aviation facilities as they are essential components of the State's transport infrastructure and national defence system.

The subject site is not in close proximity to any airports (i.e. located on land affected by the Obstacle Limitation Surface). Therefore, SPP1/02 is not applicable.

SPP 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide

State Planning Policy 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire and Landslide seeks to minimise the potential adverse impacts of natural hazards by providing guidelines for considering potential natural hazards when making decisions about development. SPP 1/03 identifies three outcomes that developments affected by natural hazard overlays must comply.

SPP 1/03 applies to assessable development not addressed by a planning scheme and subject to assessment under the IPA Reg. The assessment manager must have regard to the SPP 1/03 when assessing development proposals in "Natural Hazard Management Areas" (flood prone land, steep land and bushfire areas).

The subject site is not likely to include natural hazard management areas. The subject site may be at risk of storm surge as it adjoins the coastline

The Hydrological Data Report prepared by GHD in March 2009 for the TMPP found that the Precinct site appears to be very well sheltered in the developed case from the effect of the extreme waves. However, the channel experiences larger currents and Bed Shear Stresses when developed suggesting greater scouring potential around the toe of the breakwater, which should be mitigated through appropriate design consideration.

As detailed Health and Safety Report prepared for the Project by GHD in February 2009 details the controls will be put in place such as Emergency Response Plans, Job Safety Assessments to specifically consider imminent weather conditions to ensure safety of people, the environment and property.

SPP 1/07 – Housing and Residential Development

State Planning Policy 1/07 – Housing and Residential Development took effect on the 29 January 2007 and seeks to identify housing needs for certain Local Governments in Queensland.

This SPP applies to local governments that meet the following criteria:

- A population of 10,000 or more within at least one urbanised area; and
- A minimum average dwelling approval rate of 100 dwellings per annum over the latest five year period.

The Policy has effect when a local government decides to prepare a new scheme or amend an existing scheme or is required to amend their planning scheme as a result of a regional planning process. The Policy has no effect when development applications are assessed or when designating land for community infrastructure.

This project does not seek to amend a Local Government Planning Scheme. The Precinct site is not suitable for Housing and Residential Development and, therefore, SPP 1/07 is not

applicable to the proposed works for development of the TMPP. Upstream lands vacated by industries that may choose to relocate to the Precinct will be rehabilitated by POTL. These waterside sites would be proposed for redevelopment into mixed residential / commercial consistent with the Townsville City Plan. This policy may be relevant should the Townsville City Council seek to amend the planning scheme in relation to this land.

SPP 2/07 – Protection of Extractive Resources

State Planning Policy 2/07 – Protection of Extractive Resources came into force on the 3 September 2007. The purpose of this policy is to identify and protect extractive resource areas of state or regional significance from incompatible land uses that could potentially constrain or sterilise resources.

SPP 2/07 defines extractive resources as sand, gravel, quarry rock, clay and soil. The policy identifies a number of "Key Resource Areas" (KRAs) and "Transport Routes" throughout the State.

No identified "Key Resource Areas" or "Transport Routes" are in close proximity to the subject site and, therefore, SPP 2/07 is not relevant to the proposed works.

1.8.4.2 Local government planning controls, local laws and policies

Local Planning Scheme - Townsville City Plan 2005

Townsville City Council's *City Plan 2005* has identified that for the purposes of its planning scheme, "Strategic Port Land" is "not subject to the Planning Scheme". Both the location of the Marine Precinct and Breakwater are shown on the planning scheme maps as not being subject to the planning scheme (refer to Figure 1-1). The proposed TMPP development is therefore not subject to assessment against a Local Government Planning Scheme.

Upstream lands that will be vacated by relocating industries are currently industrial sites. Following surrender and remediation they will likely be proposed for redevelopment into mixed residential / commercial. Any proposed redevelopment will be consistent with the Townsville City Plan.

Northern Economic Triangle Infrastructure Plan (2007 – 2012)

The Northern Economic Triangle Infrastructure Plan (NETIP), prepared by the Department of Infrastructure and Planning, was released on 3 August 2007. Along with Bowen and Mount Isa, Townsville is recognised as an integral component of the economic triangle for mining, mineral processing and industrial development.

The objectives, strategies and actions of the NETIP are based on realising the vision for an economic triangle through provision of skills development, infrastructure, and leadership capable of underpinning major private sector investment. The NETIP provides a commitment to "facilitate broad economic and social development of Townsville by adoption and implementation of the Townsville Economic Gateway Strategy".

It is considered that the proposed works are consistent with intent, objectives and strategies of the Northern Economic Triangle Infrastructure Plan.

Townsville Economic Gateway Strategy (2006)

Townsville Economic Gateway Strategy (2006) forms the strategic vision of the City of Townsville. The vision seeks to balance economic, environmental and social goals and maintain the diversified economy present in Townsville. Townsville has a population of approximately 170,000 and is a key trade centre in North Queensland. It provides a lifestyle combining the best of the tropics with an amenity level generally associated with large southern capital cities.

The Port of Townsville has been integral to the development of this economy, with general commerce, trade and industrial development fuelling prosperity and creating an inseparable link between the city and its port.

The Townsville Economic Gateway Strategy (2006):

- Reinforces the Port of Townsville's central place in the region's economy; and
- Presents a vision for revitalising the city through the progressive relocation and expansion of industrial activity out of the inner city to the Port and other areas, to accommodate demand and facilitate future prosperity of the region.

Given that the proposed works seek to relocate commercial and industrial marine facilities from the city to the Port to provide for future trade, commercial and residential growth in Townsville, it is considered that the proposed works are consistent with the intent and strategies of the Townsville Economic Gateway Strategy.

Townsville City – Port Strategic Plan (2007)

In March 2006, the CG was requested to undertake a strategic planning exercise on the interface between Townsville's port and CBD. This led to the formulation of the Townsville City – Port Strategic Plan (2007) by the Department of Infrastructure and Planning in consultation with POTL, Townsville City Council, Department of Tourism, Regional Development and Industry, Queensland Transport, Queensland Treasury and the Department of Main Roads. The plan was finalised in June 2007.

The plan provides a vision for an effective and sustainable interface between Townsville's Port area and the CBD. The plan identifies eleven (11) proposed development projects throughout the CBD - Port interface area, including the Project, as desirable for Townsville.

The plan builds on previous work carried out by POTL and Townsville City Council, and identifies two (2) critical planning areas:

- The Secure Port Area where port operations are carried out; and
- The Port Interface Area between the CBD and the port, which requires careful planning to ensure that any development in this area does not adversely impact on the port.

The plan primarily focuses on the Port Interface Area and examines the interconnections between various projects within it. In addition, individual precinct development plans have been prepared for key projects within the Port Interface Area. The plan is being used by POTL and the Townsville City Council to assist with their forward strategic planning.

The following statement is made on page 1 of the Townsville Port Strategic Plan:

> *The City-Port Strategic Plan depicts, in general terms, capital works for port expansion currently being considered by the Townsville Port Authority to cope*

with anticipated growth in trade over the forthcoming 25 years. These works are shown in detail in the Port of Townsville Master Plan and include of an extensive reclamation area seaward of the existing port together with protective breakwaters and dredged deep water berthing areas. It has no statutory standing nor does it have explicit government endorsement. It is conceptual only, as are the individual projects listed and their graphic representations. The plan is intended to highlight what is achievable in Townsville's city-port interface area, to outline conflicts that exist and others that could arise, to suggest one option for the scheduling of projects to overcome these conflicts and to present these concepts in as concise a manner as possible.

Rather than being a statutory document, the plan articulates a vision and forecasted needs for the next 25 years.

The proposed works are identified as one of the first developments, with other precincts building on it in later years. Within the Strategic Plan this project is referred to as "Precinct 1 – Marine Industries and Boating Facilities: a precinct which would accommodate marine activities including shipbuilding, ship repair, commercial fishing, recreational boat ramps and marine search and rescue services, and is located on the western bank of the Ross River immediately downstream of the future Eastern Port Access Corridor".

The proposed works are central to achieving intent of the Townsville City – Port Strategic Plan (2007).

Townsville Port Authority Land Use Plan 1996

The *Townsville Port Authority Land Use Plan 1996* (TPALUP) came into force in 1996 and has statutory powers. The proposed location of the Marine Precinct and breakwater are identified as Strategic Port Land in the TPALUP. Section 285 of the *Transport Infrastructure Act 1994* provides the mechanism whereby the reclaimed land can be incorporated into the *Townsville Port Authority Land Use Plan 1996*.

A new Land Use Plan is currently under preparation (Statement of Proposals document advertised for public comment in 2007) and is expected to be gazetted by the end of 2009. It is considered that the proposed works are consistent with this draft Land Use Plan.

It is considered that the proposed works are consistent with the TPALUP and the Draft Review of the Port Land Use Plan.

1.8.5 Approval summary

To date no approvals have been obtained for the project. Table 1-4 lists the approvals required and the applicable act regulating the approval. Table 1-5 indicates expected timeframes for the various approvals and Table 1-6 provides a summary of the estimated timeframes for the approvals where timeframes for applications can run concurrently.

Table 1-4 Approvals required for the Townsville Marine Precinct Project

Legislation Administering Authority		Trigger Project	Response
Land Act 1994	Departmental of Natural Resources and Environment	Tenure	Prior to application being made for Resource Allocation, application must be made to lease the unallocated State land. Presently Lot 773 already has tenure, however an application is necessary for the area under the breakwater. Once the land is reclaimed, POTL can apply for ownership of the land. However, in terms of section 127(3), if the reclaimed land is held under lease, that lease must be surrendered before a deed of grant can be issued.
Native Title Act 1993	Departmental of Natural Resources and Environment	Native Title Notification	During the establishment of the perpetual lease for Lot 773 Native Title was determined to have been suppressed pursuant to the non-extinguishment principle. Should POTL wish to freehold Lot 773, the process will involve surrender of the current perpetual lease with the subsequent re-emergence of Native Title rights and interests in the area. In this case, the Assessment Manager would be responsible for undertaking Native Title Notification. Notification is undertaken at the time when an application for a development permit (for instance an application for prescribed tidal works) is lodged. The process runs concurrently with the IDAS process.
Coastal Protection and Management Act 1995	Departmental of Natural Resources and Environment	Resource Allocation	A Resource Allocation must be obtained prior to the application for Tidal Works is lodged. Application is lodged with the Environmental Protection Agency. [Refer to the DERM Guideline "*Allocation of quarry material*"]

Legislation Administe	ring Authority	Trigger Project	Response
Integrated Planning Act 1997	Department of Infrastructure and Planning	Tidal Works	The Assessment Manager for an application for Tidal Works is the relevant local authority. In this case the Assessment Manager would be POTL for the TMPP. The application will cover the work for dredging as well as the disposal of material in tidal water. The application will require referral to the following agencies: ◗ Department of Natural Resources and Environment (DERM) as concurrence agency. ◗ Department of Employment, Economic Development and Innovation Queensland Primary Industries and Fisheries DEEDI as concurrence agency. ◗ Department of Infrastructure and Planning (DIP) as advice agency.
Environmental Protection Regulation 2008	Departmental of Natural Resources and Environment	Proposed dredging associated with the development is classified as ERA 16	In accordance with changes to the ERA legislation (in force as of 1 January 2009), port authorities are no longer exempt from requiring approval to undertake dredging. POTL will be required to make an application for ERA 16.

Legislation Administe	ring Authority	Trigger Project	Response
Vegetation Management Act 1999	Departmental of Natural Resources and Environment	Operational works, clearing vegetation, including vegetation to which the VMA applies.	As the Project involves the reclamation of land there is unlikely to be any clearing of vegetation. However, some vegetation clearing may be required as part of the construction of any road or access way. DERM would assess any clearing required for the proposed works against the relevant Regional Ongoing Clearing Code. Only the clearing of remnant vegetation (native vegetation that occurs in a mapped Regional Ecosystem (RE), or that meets the structural and species requirements to be mapped as a RE) will be assessed under this process (non-remnant vegetation can be cleared under this VMA without a permit).
Fisheries Act 1994	Department of Employment, Economic Development and Innovation Queensland Department of Primary Industries and Fisheries	Operational Works ◗ Taking, causing damage to or disturbance to marine plants, including mangroves; ◗ Works in a declared fish habitat; ◗ Waterway barrier works; and ◗ Tidal water, fresh and marine aquaculture operations.	The proposed works are likely to result in the disturbance of marine plants and therefore requires assessment against the FA. Therefore, when the application for tidal works is lodged, the proposal will be referred to the DPI&F as a referral agency.

Table 1-5 Estimated timeframes to obtain approvals required for the Townsville Marine Precinct Project

Type of Approval	Expected Timeframe	Comment
Tenure		Prior to application being made for Resource Allocation, application must be made to lease the unallocated State land. Once the land is reclaimed, POTL can apply for ownership of the land. However, in terms of section 127(3) of the Land Act 1994, if the reclaimed land is held under lease, that lease must be surrendered before a deed of grant can be issued.
Resource Entitlement	10 to 20 Business Days	Can run concurrently with application for Resource Allocation. Resource Allocation has to be obtained prior to the application for Tidal Works is lodged.
Resource Allocation	20 to 60 Business Days [Timeframe is estimated as there are no statutory timeframe applicable]	Can run concurrently with application for Resource Entitlement. Must be obtained prior to the application for Tidal Works is lodged. Application is lodged with the Environmental Protection Agency. Obtaining approval may take around 28 dates if all relevant information is provided. [Refer to the DERM Guideline "*Allocation of quarry material*"]
Tidal Works	14 - 23 Weeks	Application can only be lodged after Resource Entitlement and Resource Allocation had been approved. It should be noted that the Information Stage and the Decision Stage of the IDAS process can be extended without the applicant's consent and further extensions can occur with the applicant's consent. More complicated applications can take anything from 26 to 52 weeks. Native Title Notification runs concurrently with the IDAS process. A realistic timeframe for the approval of the tidal works would be 26 weeks.

Table 1-6 Summary of estimated timeframes to obtain approvals required for the Marine Precinct Project

Type of Approval	Expected Timeframe	Comment
Tenure		Prior to application being made for Resource Allocation, application must be made to lease the unallocated State land. Once the land is reclaimed, POTL can apply for ownership of the land. However, in terms of section 127(3) of the Land Act 1994, if the reclaimed land is held under lease, that lease must be surrendered before a deed of grant can be issued.
◗ Resource Entitlement; ◗ Resource Allocation; and ◗ Operator Registration Certificate	20 to 60 Business Days (4 – 12 weeks)	
◗ Tidal Works; and ◗ Environmentally Relative Activity (ERA) 16	14 - 23 Weeks	
TOTAL	18 – 35 weeks	It is suggested that the longer timeframe of 35 weeks be considered the more accurate estimate.

1.9 Accredited process for controlled actions under Commonwealth legislation

This project has been determined to be a controlled action under the Australian Government EPBCA. In this regard, the Australian Government has accredited the state's EIS process for the purposes of the Australian Government assessment under Part 8 of the EPBCA.

When a State EIS process has been accredited, it is necessary to address potential impacts on the matters of national environmental significance that have been identified in the 'controlling provisions' for the project. In this case the matters are as follows:

- Sections 12 and 15A (World heritage properties);
- Sections 15B and 15C (National heritage places);
- Sections 16 and 17B (Wetlands of international importance);
- Sections 18 and 18A (Listed threatened species and communities); and
- Sections 20 and 20A (Listed migratory species).

A stand-alone report addressing the matters of national environmental significance is provided as Section 7. This document exclusively and fully addresses the issues relevant to the controlling provisions.

A description of the affected environment relevant to the matters protected, including assessment of relevant impacts and mitigation measures and potential offsets, is provided under Section 3 of this document. The policy against which offsets have been assessed is described following.

1.10 Queensland Government Environmental Offsets Policy

The Queensland Government Environmental Offsets Policy (QGEOP) was developed by the DERM. The policy provides a framework for the appropriate use of environmental offsets across terrestrial and aquatic ecosystems, based on the principles of *Ecologically Sustainable Development* (ESD) and the premise that offsets should only be considered after all environmental impacts have been avoided and minimised.

An environmental offset is a positive action for the natural environment taken to counterbalance unavoidable, negative environmental impacts that result from an activity or a development. It differs from mitigation in that it addresses remaining impacts, after attempts to reduce (or mitigate) the impact have been undertaken. An offset may be located within or outside the geographic site of the impact.

The scope of the QGEOP is limited to Queensland Government-led assessment of impacts to environmental values and it applies where current legislation triggers State Government assessment of impacts on environmental values. The QGEOP applies to decisions on *development approvals* under a range of approval processes, that is, for all developments under the EP Act, IPA, the SDPWOA and Main Roads administrative processes.

As the TMPP has been declared a Significant Project under the SDPWOA, the need for offsets should be considered during the EIS assessment stage. The project design considered in the

EIS has been considered to avoid and minimise environmental impacts. However, there are remaining impacts that are covered by a specific-issue offsets policy(s) and, accordingly, it is anticipated that the CG's report will provide recommendation for the provision of offsets consistent with the specific-issue offsets policy(s).

Queensland currently has three specific-issue offsets policies that provide detailed direction for offsets that address specific environmental issues and are administered by the relevant government agencies. The specific-issue offsets policies, and their regulating agencies are:

- Vegetation Management — Policy for Vegetation Management Offsets, September 2007, DERM.
- Fish Habitat Management Operational Policy FHMOPOO5 — Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss, 2005, DEEDI.
- Koala Habitat — Offsets for Net Benefit to Koalas and Koala Habitat, 2006, DERM.

As the proposed works are likely to result in the disturbance of marine plants (refer Section 3.10) the relevant offset policy for the TMPP is the Fish Habitat Policy. Koalas are not a feature of the landscape of the project area and vegetation is not expected to be impacted for development of the Precinct (as discussed in Section 3.10) and, accordingly, the other specific-issue policies are not applicable to this project.

1.10.1 Fish Habitat Management Operational Policy

The Fish Habitat Management Operational Policy (FHMOP) assists and guides permit assessment to achieve mitigation of impacts and compensation for marine fish habitat losses that are likely to result from authorities granted under the Fisheries Assessment. A range of actions for mitigation or compensation are recognised by the FHMOP that can include:

- Best practice methodologies;
- Habitat productivity enhancement;
- Restoration/rehabilitation or replacement of fish habitat;
- Fisheries resource research, education support and community initiatives;
- The payment of bonds (held towards ensuring that impacts are minimal;
- Fish habitat acquisition/exchange (relinquishment of private tenure); or
- . Fisheries stock enhancement;
- Signage or educational materials for marine fish habitat information management; or to enhance fishing access for the community; and
- Land-exchange where landholders may choose to relinquish critical fish habitats to the State, and in some cases, for these habitats to be included within declared Fish Habitat Areas.

Compensation options may be part of a 'Statewide Compensation Program' that may consider projects including:

- Undertaking/funding restoration projects across the State, where outcomes have a Statewide application;
- Initiating community awareness projects; or

- Contributing credits before debits are used (mitigation banking concept).

Mitigation or compensation agreements will be recognised as a condition of the authority granted, and monitoring will be required to evaluate and document the success of the measures adopted.

Section 3.10 of this document provides information on the existing conditions, potential impacts that may result from the TMPP and strategies for mitigation of those impacts. Where impacts may not be mitigated discussion of an appropriate offset against those impacts is provided in accordance with this policy.