

CAIRNS SHIPPING DEVELOPMENT PROJECT

Revised Draft Environmental Impact Statement

Executive Summary



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ES.A.1 Introduction

Overview

This Revised Draft Environmental Impact Statement (EIS) assesses the environmental, social and economic impacts associated with the construction and operation of the proposed Cairns Shipping Development Project (henceforth known as 'the project' or 'the CSD Project') at the Port of Cairns that has been revised as a result of legislative changes since the initial draft EIS (2014).

The key components of the project involve dredging a wider and deeper entrance channel and cruise ship swing basin to allow port access for larger cruise ships, relocation of the cargo ship swing basin to allow future Navy base expansion, and upgrading berth infrastructure within Trinity Inlet. The dredging operations involve the removal of in-situ sediment material from within and adjacent to the existing shipping channel and placement at suitable land placement sites. Ongoing annual maintenance dredging (via existing approvals) will continue to be required to maintain the full functionality and safety of the port and entrance channels. The project also includes associated upgrades to landside port infrastructure required to accommodate larger cruise ships.

This Revised EIS seeks to evaluate the project and its impacts, to allow the State and Commonwealth regulators to decide whether or not it should proceed to the development approval phase. It also provides information for government agencies and the community about the project, and how the proponent intends to avoid, mitigate and manage its potential impacts.

EIS Process

The original Project was declared a 'coordinated project' under Section 26 (1) (a) of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act) in September 2012, and it was determined that an EIS was required to assess the impacts of the Project. Terms of Reference (ToR) for the EIS were released by the Queensland Coordinator-General in November 2012.

The project was also referred to the Commonwealth Minister for Sustainability, Environment, Water, Population and Communities (SEWPaC), now the Department of the Environment and Energy (DoEE), to determine whether it is a 'controlled action' under the *Environmental Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act). In October 2012, it was determined the project is a controlled action, requiring assessment and approval under the EPBC Act. The Commonwealth EIS Guidelines (EIS Guidelines) were released in March 2013. On 13 December 2016 DOEE confirmed that the EIS guidelines remain applicable to the revised Project.

This Revised Draft EIS must follow the format and content outlined in the ToR and the EIS Guidelines; this document has been prepared to address the requirements of both documents. Cross-reference tables have been provided showing how each requirement of the ToR and EIS Guidelines have been addressed.

Once submitted, the Revised Draft EIS will be considered separately under the two assessment frameworks as follows:

1. Under the state (SDPWO Act) process, the EIS and any additional information will be evaluated by the Coordinator-General. The Coordinator-General will then prepare a report that includes the evaluations of, and conclusions regarding, the project's environmental impacts and proposed mitigation measures. After considering all of this information, the Coordinator-General will recommend the project either:
 - proceed subject to conditions and recommendations designed to ensure the project's environmental impacts are properly managed
 - be refused on the grounds its environmental impacts cannot be adequately addressed.

The Coordinator-General's evaluation report on the EIS is not an approval in itself. Subsequent approvals and permissions will also be required for the project under other relevant Queensland and Local Government legislation.

2. Under the Commonwealth (EPBC Act) process, the information presented in the Revised Draft EIS must be sufficient to allow the Minister to make an informed decision on whether or not to approve, under Part 9 of the EPBC Act, the taking of the action for the purposes of each controlling provision.

Project Need

The existing channel for the Port of Cairns is not wide or deep enough to allow safe access for larger vessels, particularly mega cruise ships, and the existing swing basin location restricts HMAS Cairns' Navy Base expansion capacity.

At present, almost half of the cruise ships visiting the area are unable to enter the Port of Cairns due to their size. Currently, these larger 'mega class' cruise ships must anchor offshore at Yorkeys Knob, located 15 km north of Cairns. Yorkeys Knob does not have a cruise ship terminal and passengers and crew are ferried ashore to the Yorkeys Knob Boating Club facility, before being transported by bus into the Cairns CBD and other day tour destinations. This practice has uncertainties (there are periods when weather conditions are unsuitable to ferry passengers ashore) and inefficiencies for both cruise ship operators, the local economy and businesses.

The expansion of cruise ship facilities in Cairns is an important step in developing increased tourism opportunities in North Queensland and is necessary to support and grow cruise shipping operations in Queensland. The Cairns Shipping Development Project will enable Cairns to attract and accommodate the growing cruise shipping market and secure associated economic benefits. Increased numbers of visiting cruise vessels will result in considerable benefits to the local and Queensland economies. This will lead to the general expansion of North Queensland's cruise industry, opportunities for increased cruise itineraries throughout the State and bring growth, stability and diversity to the Cairns tourism market sector.

While the main purpose of the project is to take advantage of cruise shipping opportunities, there are also significant other benefits to non-cruise forms of shipping, including:

- Enabling future expansion of the HMAS Cairns Navy base (by relocating the existing main swing basin), in keeping with the Defence Force Posture Review (Hawke & Smith 2012) which recommends upgrading / expansion of bases at Cairns and Darwin. This could bring extra permanent defence force staff to reside in Cairns.
- The channel expansion would provide access for the existing RAN LHD vessels and also allow larger visiting overseas Navy vessels (in particular US Navy carriers) to enter the Port for Rest and Relaxation visits.
- The wider and deeper shipping channel will reduce current tidal and loading restrictions on bulk cargo ships accessing the Port of Cairns, thereby improving Port efficiency.
- The deeper and wider channel will provide increased resilience for the Port of Cairns against an extreme weather event which can result in the loss of depth and reduced ability for cargo ships to safely navigate the channel.

Consideration of Alternatives

This Revised EIS considered the following alternatives to the project, however none were considered to be logistically viable or able to fully deliver the objectives of the project:

- The 'Do Nothing' Scenario
- Use of an alternative site to the Port with a potential new mooring jetty at either Yorkeys Knob or Yarrabah
- Improved tendering alternatives at Yorkeys Knob and seaward of the existing shipping channel
- Minor upgrades to existing infrastructure without upgrade of the existing channel

Project Proponent

The proponent for the Project is the Far North Queensland Ports Corporation Limited, trading as Ports North, which operates the Port of Cairns as well as a number of other trading North Queensland ports including Karumba, Thursday Island, Cape Flattery and Mourilyan.

Ports North is a Queensland Government-owned Corporation established under the *Government Owned Corporations Act 1993* (Qld) that develops and manages port facilities including bulk shipments (e.g. sugar, molasses, fuel, sand, magnetite), marina and tourism facilities.

As a Ports Corporation, Ports North has statutory power under the *Transport Infrastructure Act 1994* (Qld) and the *Transport Infrastructure (Ports) Regulation 2005* (Qld) to issue licenses, leases and permits for the use of its port facilities and provides a number of multi-user facilities at its ports to achieve higher utilisation of infrastructure and greater efficiency. Ports North is also responsible for maintaining navigable Port depths, Port facilities and Port operations while vessels are alongside its facilities. The operations of the port are strongly supported by the community, particularly the cruise operations.

Ports North employs a workforce of 70 employees spanning a variety of professional, technical, trade and administrative roles in fields of planning and projects, environmental management, hydrographic survey, asset management, maritime operations and security, information technology, commercial, financial and corporate services. Ports North's Marine Pilots undertake the pilotage of all cruise ship transits of the Cairns Shipping Channel, berthing arrivals and departures. Relevant trade and tertiary qualifications and long standing experience are held across all fields.

The postal address and contact details for Ports North are:

Cnr Grafton & Hartley Streets (PO Box 594)

Cairns QLD 4870

Phone: + 61 7 4052 3888

Fax: + 61 7 4052 3853

Email: enquiries@portsnorth.com.au

Environmental Track Record

Ports North has a successful history of compliance with its environmental obligations, permits and approvals for operations and major projects. It manages several ports and associated shipping activities in areas of high conservation value. Whilst operating in such environments, Port North maintained a high level of compliance and effective management of its port operations without the occurrence of significant environmental harm or major incident, fine or reprimand.

An Environmental Management System consistent with ISO14001 is in place which addresses environmental management issues including planning, checking, and continual review of Ports North's management system and procedures inclusive of emergency response plans, loading and unloading of ships, stormwater management, oil spill response and waste controls. The existing EMS has been subject to external audits with a view to proceeding to ISO14001 certification in the future.

Stakeholder and Community Engagement

Ports North engaged with a wide range of stakeholders and community members during the preparation of the Draft and Revised Draft EIS.

Given that the major component of this project is proposed dredging to expand the shipping channel, engagement activities focused on the people and groups who have the greatest potential to be impacted by this aspect of the project. This included public sector, private sector, tourism bodies and NGO stakeholders with an interest in the marine environment and economic development.

The views of the broader community have also been taken into consideration during the preparation of the EIS through community engagement activities and the monitoring of public opinion.

Ports North CSD Project Stakeholder Engagement Report (**Appendix E**) provides a full summary of the engagement activities undertaken for the Project.

EIS Structure

This current document is described as a Revised Draft Environmental Impact Statement (Revised Draft EIS) as allowed for under the administrative provisions of the SDPWO Act and the Queensland Sustainable Ports Development Act (2015).

This Revised Draft EIS provides the identification and assessment of environmental impacts across a range of environmental and socio- economic disciplines. It is structured as five main components:

Executive Summary

Part A – Introduction, Project Background, Project Description, Legislation and Approvals

Part B – Technical Assessments

Part C – Management Plans

C1: Construction Environmental Management Plan

C2: Dredge Management Plan

C3: Vessel Transport Management Plan

C4: Maritime Operations Management Plan

Part D – Appendices.

The Technical Assessments of this Revised Draft EIS adopt a risk-based approach to assessing the significance of identified impacts, which considers the geographical extent, duration of the impact, sensitivity of the receiving environment to the impact, and the likelihood of it occurring.

Study Team

The Revised Draft EIS was prepared on behalf of Ports North by Flanagan Consulting Group (FCG) as the lead EIS consultant. FCG's Project Team was led by Pat Flanagan as Project Director supported by David Finney (Envirofin) as Project Manager, Greg Fisk (BMT-WBM) as the technical lead with specific responsibility for the marine based assessments and David Rivett (Environment North) as the technical lead with specific responsibility for the terrestrial assessments.

Other sub-consultants and professionals were engaged to provide technical advice during the preparation of the Revised Draft EIS and in many cases produced technical reports used in completing the technical chapters.

Public Submissions

This Revised Draft EIS is made available for public comment in accordance with Section 33 of the SDPWO Act.

The EIS can be viewed online at: <http://www.portsnorth.com.au/>

Hard copies are also available at Queensland State Library (South Brisbane), Cairns City Library (Abbott St) and Smithfield Library (Cheviot Street).

Written submissions on the Revised Draft EIS in relation to the Queensland Governments Terms of Reference may be made to the Queensland Coordinator-General at the following address:

The Coordinator-General

C/- EIS project manager – Cairns Shipping Development Project Coordinated Project Delivery

Office of the Coordinator-General PO Box 15517

City East Qld 4002

Email submissions can be made to: CairnsSDP@coordinatorgeneral.qld.gov.au

For submissions made to the Queensland Co-ordinator General, a properly made submission must:

- be made to the Co-ordinator General in writing
- be received on or before the last day of the submission period
- be signed by each person who made the submission
- provide the name and address of each person who has made the submission.

Submissions must be made to the Coordinator-General by close of business on **Friday 25 August 2017**

Submissions received during the submission period will be collated by the Office of the Coordinator-General and provided to the proponent, Ports North.

Where additional information is required to address submissions, responses will be issued by Ports North, to the relevant government agency for final consideration in assessment of the EIS.

ES.A.2 Project Background

Original Project and Assessment

The project as defined in the Initial Advice Statement (Ports North 2012) was assessed in a Draft Environmental Impact Statement (Draft EIS) prepared by Ports North in 2014. Broadly, this involved upgrading of the following infrastructure for the Port of Cairns, essentially to accommodate larger cruise ships and potential future expansions of HMAS Cairns Navy base operations:

- expansion of the existing shipping channel and shipping channel swing basin, resulting in a dredge volume of 4.4 M m³ and associated placement at sea
- placement of maintenance dredge material at sea
- establishment of a new swing basin to support future expansion of the HMAS Cairns Navy base
- structural upgrade of the existing shipping wharves
- provision and upgrade of services to the wharves.

The Draft EIS was based on the then preferred option of marine placement of capital dredge material. Key steps in the approvals process that have been completed are:

- review by Queensland Government agencies and the Coordinator-General (20 April 2015 to 1 June 2015)
- public notification and receipt of submissions (20 April 2015 to 11 June 2015).
- assessment of the Draft EIS by the Coordinator-General and the Commonwealth Minister for the Environment was not completed as due to changed circumstances, a Revised Draft EIS was required.

Changed Circumstances

Since the completion of the Draft EIS, a number of key circumstances have changed:

- The Commonwealth Government determined that placement of capital dredge material would no longer be permitted within the Great Barrier Reef Marine Park (GBRMP) (given effect under Regulation 88RA of the *Great Barrier Reef Marine Park Regulations 1983*).
- The Queensland Government passed the Sustainable Ports Development Act 2015 (Qld) which prohibits capital dredging above a certain threshold for the Port of Cairns (except under this current EIS process) and requires, under section 36(2), that any subtidal placement options or reclamation of land options within the Great Barrier Reef World Heritage Area (GBRWHA) will need to meet a 'beneficial reuse' test.

The EIS Guidelines and ToR require options for placement of the dredge material, both land and marine, to be assessed. However, given the above new circumstances this is no longer appropriate and material from capital dredging now must be placed on land. Marine placement is still permitted for material from maintenance dredging (Ports North has a current permit for this activity until 2020).

Revisions to the Project

Following the change of Commonwealth and Queensland legislation, Ports North commissioned the Department of Transport and Main Roads (Maritime Safety Queensland) to undertake cruise ship navigation simulations to identify the channel characteristics that would optimise cruise ship numbers, whilst limiting required dredging volumes. Simulations focussed on minimising channel widening and deepening to facilitate usage of the channel by vessel sizes up to Vista and Grand Class vessels (up to 300m in length), without compromising safety. The recalibrated channel design based on the simulations resulted in a significant reduction of in situ dredging volume requirement from 4 400 000 m³ to 1 000 000 m³.

A Demand Update based on the revised channel configuration revealed that the substantial majority (83%) of the 2031 projected demand for cruise vessel access could be accommodated at Trinity Wharf as a result of the proposed revised channel configuration. The revised channel provides a much greater rate of return on investment at a substantially lower capital cost than the original channel upgrade proposed in the Draft EIS.

Following channel recalibration PN commissioned an Options Study to identify suitable options for onshore placement of capital dredging material. The study identified 14 potential placement precincts which were refined through detailed Multi- Criteria Analysis techniques to two preferred precincts at the Barron Delta and Trinity East, for further more detailed assessment.

Development of the revised Project adopted an impact avoidance, minimisation and mitigation through design and involved the following sequence of assessments and design considerations which arrived at the project description on which detailed assessments of project impacts are based:

- Identification of values and threats (Values Assessment) and commencement of baseline environmental studies at the Barron Delta and East Trinity Precincts, including terrestrial and marine ecology, soils, water resources, coastal processes, marine water quality, flooding and stormtide, noise and air quality, cultural heritage and visual amenity.
- Initial assessment of dredge material characteristics (including Potential Acid Sulfate Soils) and development of a preliminary channel geotechnical model which identified material types, bulking factor and spatial distribution; dredging methodologies; classification of dredge materials as soft (PASS and non-PASS) and stiff clays.
- Development of preliminary options within the Barron Delta and East Trinity Precincts using a Trailer Suction Hopper Dredge and pipeline delivery of dredge material to a shore based Dredge Material Placement Area(s) (DMPA)
- Multi- Criteria analysis of DMPA Constraints and Opportunities at the two precincts which identified the Barron Delta as the preferred precinct.

- Design Optimisation studies including detailed analysis of the Barron Delta (Northern Sands) void capacity, consideration of PASS management, groundwater impacts, flooding and sediment remobilisation management and pipeline route options.
- On the basis of dredging industry advice that stiff clay components of the material to be dredged were not able to be pumped, a separate DMPA for this material was identified on partially developed Port North land (Tingira Street, Portsmith) assuming use of Backhoe Dredger and hopper barge delivery to shore.
- Channel design optimisation, dredging methodology and preliminary dredging logistics planning; revision of dredge material volumes on the basis of revised dredge material bulking factor testing outcomes, dredging insurance depth requirements and subsequent revision of Barron Delta DMPA concepts.
- Confirmation of the revised project including definition of final DMPA concept designs at Northern Sands and Tingira Street.

Revised Project

The project assessed by this Revised Draft EIS involves:

- deepening of the existing various channel segment target depths to increase the depth declaration from -8.3m to -8.8m,
- widening of approximately 3km of the outer channel by 10m,
- widening of the channel bend from 150m to 180m
- realignment and widening the channel bend transits over approximately 3km by 10m to 60m,
- widening of the inner channel by 20m over approximately 1km,
- deepening of the existing Crystal swing basin,
- creation of a new (relocated) cargo ship swing basin,
- structural upgrade of the existing shipping wharves, and;
- provision and upgrade of services to the wharves.

The widening and deepening results in a capital dredging requirement of up to 1m^3 with this material being placed on land (soft clays in a sand mining void on the Barron Delta and stiff clays on existing Port land at Tingira St Portsmith) .

Whilst this revised project has substantially reduced dredging volumes (from 4.4 M m^3), wharf and services upgrade aspects of the project are essentially unchanged from the project assessed in the Draft EIS.

ES.A.3 Project Description

Project Elements

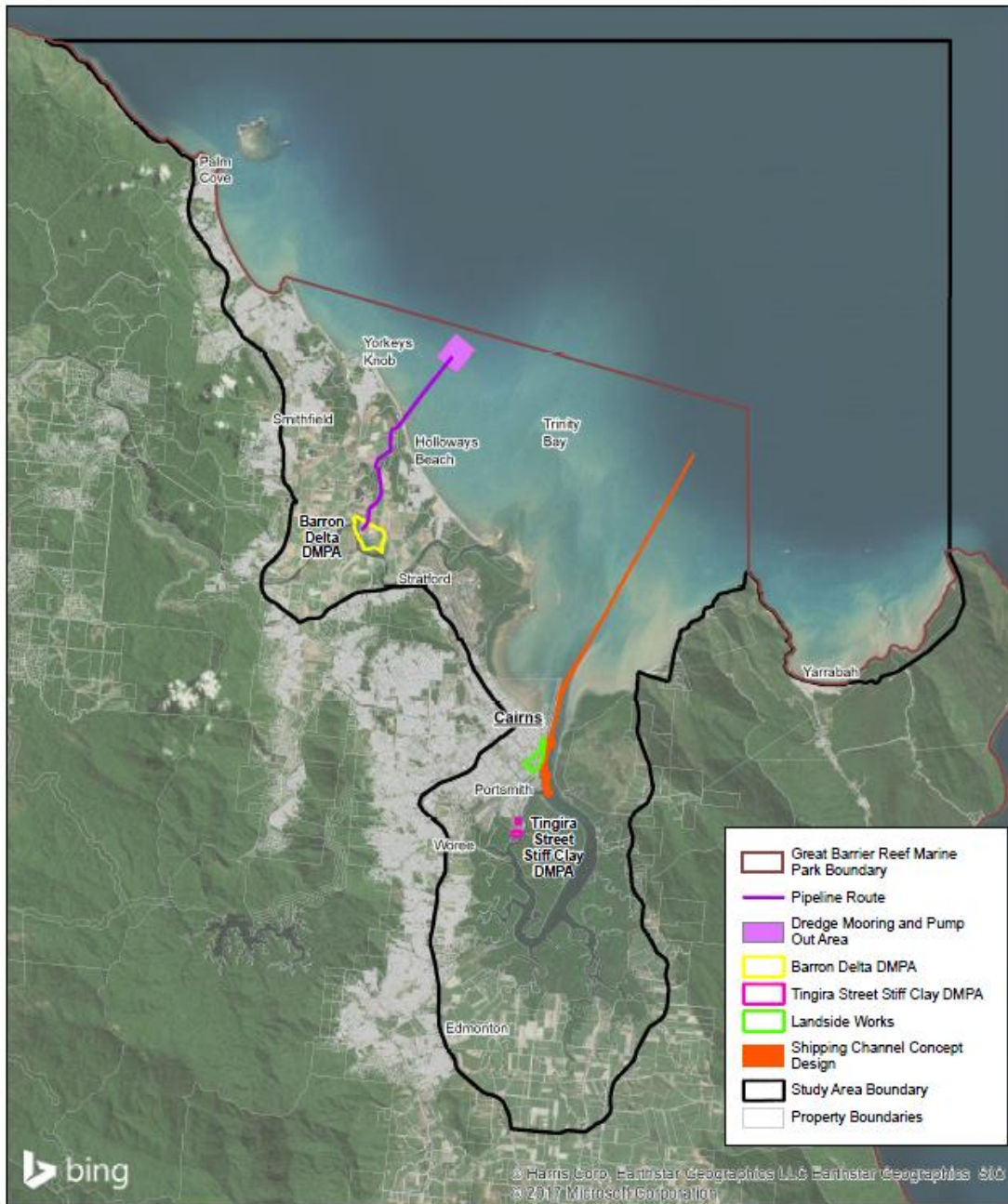
Locations of the project elements are shown in **Figure ES-1**. The revised project involves upgrading the following port infrastructure:

- **Marine works** to widening and deepen the shipping channel and Crystal swing basin, and establishment of a new shipping swing basin (Smith Creek Swing Basin) upstream of the existing Main Swing Basin involving:
 - Capital Dredging works involving removal of up to $1\ 000\ 000\text{m}^3$ of dredge material consisting of up to $900\ 000\text{m}^3$ of soft clays to be removed by a Trailer Suction Head Dredge (THSD) and up to $100\ 000\text{m}^3$ of stiff clays to be removed by a Back-Hoe Dredge (BHD).
 - The proposed upgraded dimensions of the channel, swing basins, wharf berths are shown in **Figure ES-2**.
 - Construction of a temporary pump out facility located approximately 3 km off-shore from Yorkeys Knob
- **Delivery and placement of dredged material to land based Dredge Material Placement Areas** including:
 - Construction of a temporary dredge material delivery pipeline from the pump out facility to the soft clay

DMPA on the Barron Delta and construction of a pipeline to deliver tailwater to the Barron River (**Figure ES-3**)

- Placement of soft clay dredge material at the Barron Delta DMPA located on Lot 2/RP712954 and Lot 5 on SP245573
- Placement of stiff clay dredge material at the Tingira St DMPA established on Port Land (Lot 27/SP 218291) located at Tingira St, Portsmith
- **Ancillary infrastructure/services upgrades including:**
 - Relocation of existing and installation of new navigational aids.
 - Fender system upgrade to the existing cruise shipping wharves 1-5 to accommodate larger and heavier cruise ships. Decommissioning and demolition of wharf 6 with retention and upgrading of key bollards and retention
 - Upgrade of ship services to the cruise shipping wharves, including Intermediate Fuel Oil (IFO), potable water and fire-fighting services

The project will result in an increased channel footprint of 19%, however as large areas of the inner port and channel are “self cleaning”, maintenance dredging increases resulting from the project are anticipated to be limited to 2- 6% of the current long term average maintenance volumes. This level of increase is within the order of annual variations experienced due to seasonal variability and frequency of extreme weather events.



 **Ports North**

Cairns Shipping Development Project
Revised Draft EIS

Project Location Plan

Ref: 3527-02-02
Date: 25/05/2017
Projection: MGA94 Zone 55
Scale at A4 Size: 1:200,000

0 2 4 8 Kms

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Figure ES-1 Project Location

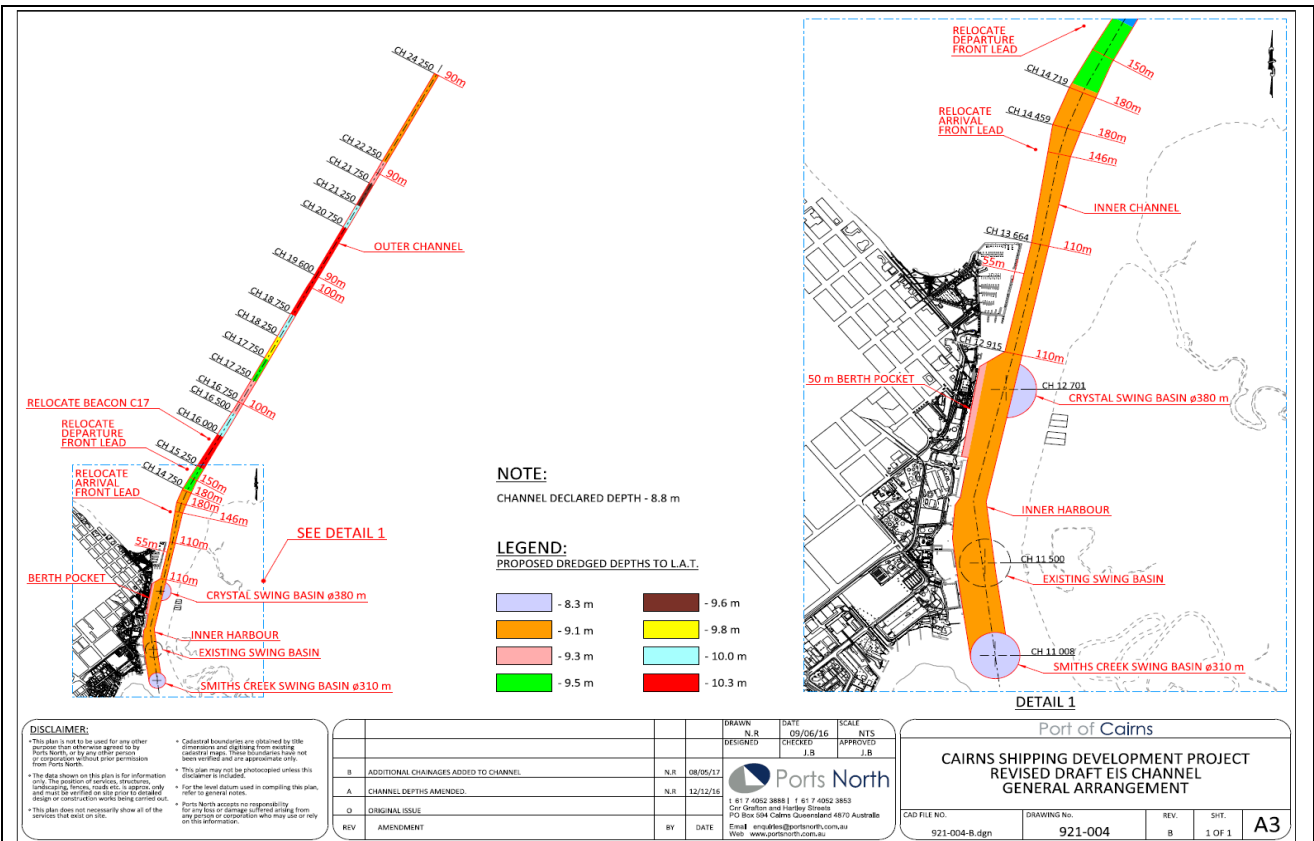


Figure ES-2 Proposed upgraded channel and swing basins.

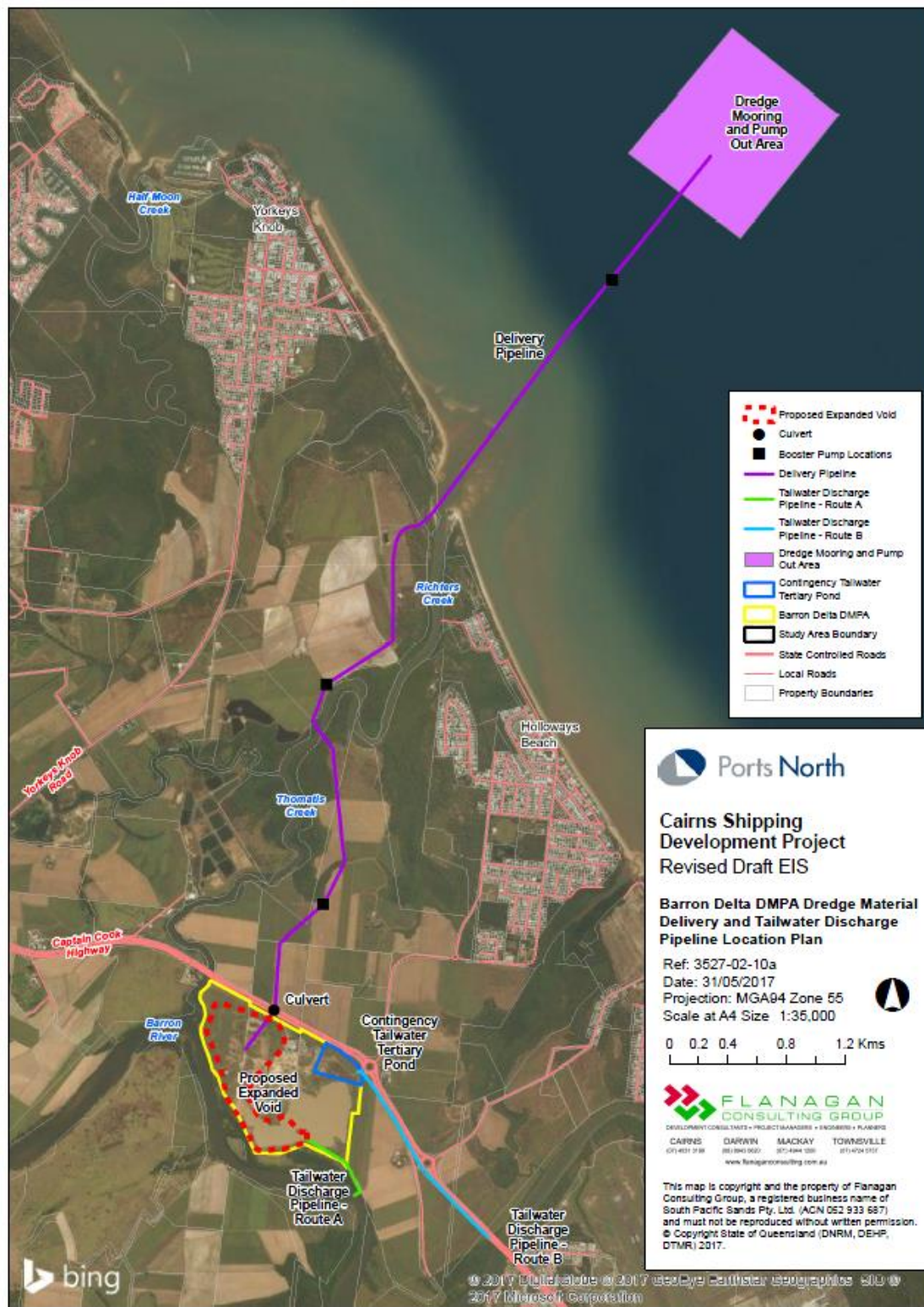


Figure ES-3 Barron Delta DMPA and Pipeline Locations

It is anticipated that the soft clay dredging campaign will have a duration of up to **12 weeks**. It is anticipated that the stiff clay dredging campaign will have a duration of **5 weeks**. The durations of the two dredging campaigns are not cumulative and they will be conducted concurrently.

Construction works for the temporary offshore pump out facility and the dredge material delivery pipeline will be timed to ensure that the facilities are available at the commencement of the dredging campaign. is anticipated to take **6 weeks**. Demobilisation of the temporary facilities is anticipated to take **4-6 weeks** following completion of the dredging campaign.

The estimated construction period for the wharf upgrade is **12 months**. Commencement of the wharf and services subgrades will commence following receipt of project approvals and funding confirmation.

Cruise ships will be able to utilise the upgraded channel, wharf, and services upgrade upgrades which are anticipated to be completed by **late 2019**.

ES.A.4 Legislation and Approvals

Section 3.8 of the Terms of Reference for the Cairns Shipping Development Project requires the Commonwealth, Queensland and local government legislation, policies and the planning frameworks relevant to the project and the approvals required to be identified.

International Convention/Treaty Obligations

In addition to the requirements enacted by Commonwealth and Queensland legislation, a number of international conventions are relevant to the Great Barrier Reef (GBR), including, but not limited to:

- Convention for the Protection of the World Cultural and Natural Heritage, 1972 (the World Heritage Convention)
- Convention on Biological Diversity, 1992 (the Biodiversity Convention)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973 (CITES)
- Convention on the Conservation of Migratory Species of Wild Animals, 1979 (the Bonn Convention)
- Convention on Wetlands of International Importance Especially as Waterfowl Habitats, 1971 (the Ramsar Convention)
- International Convention for the Prevention of Pollution from Ships, 1973 (the MARPOL Convention)
- Protocol to the London Convention (previously known as the Protocol to the Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matters 1972)
- United Nations Convention on the Law of the Sea, 1982 (the Law of the Sea Convention or UNCLOS)
- United Nations Framework Convention on Climate Change, 1992 (the FCCC)
- UNESCO 2001 Convention for the Protection of the Underwater Cultural Heritage consideration.

Relevant Commonwealth Legislation

The following provides an overview of relevant Commonwealth legislation, including:

- Aboriginal and Torres Strait Islander Heritage Protection Act 1994
- Environment Protection and Biodiversity Conservation Act 1999
- Historical Shipwrecks Act 1976
- Marine Safety (Domestic Commercial Vessel) National Law Act 2012
- Maritime Transport and Offshore Facilities Security Act 2003
- Native Title Act 1993
- Navigation Act 2012

Relevant Queensland Legislation

The following provides an overview of relevant Queensland government legislation including:

- Aboriginal Cultural Heritage Act 2003
- Building Act 1975
- Coastal Protection and Management Act 1995
- Environmental Protection Act 1994
- Environmental Offsets Act 2014
- Fisheries Act 1994
- Land Act 1994
- Land Protection (Pest and Stock Route Management) Act 2002
- Marine Parks Act 2004
- Native Title (Queensland) Act 1993
- Nature Conservation Act 1992
- Planning Act 2016
- Queensland Heritage Act 1992
- State Development and Public Works Organisation Act 1971
- Sustainable Ports Development Act 2015
- Transport Infrastructure Act 1994
- Transport Operations (Marine Pollution) Act 1995
- Transport Operations (Marine Safety) Act 1995
- Transport Operations (Road Use Management) Act 1995
- Transport Security (Counter Terrorism) Act 2008
- Vegetation Management Act 1999
- Waste Reduction and Recycling Act 2011
- Water Act 2000

Relevant Plans and Policies

Relevant national, state, regional and local planning plans and policies include:

- Australian Maritime Safety Authority Marine Orders
- Cairns Plan 2016
- Ports North (Cairns Port Authority) Land Use Plan (LUP)
- Environmental Protection and Biodiversity Conservation Act, Environmental Offsets Policy 2013
- Environmental Protection Policies (EPP)
- Environmentally Relevant Activities (ERA)
- Far North Queensland Regional Plan 2009-31 (FNQRP)
- Fish habitat policies
- Great Barrier Reef Marine Park - Cruise Shipping Policy for the GBRMP 1999
- Maritime Safety Queensland Regulation 2002
- National Assessment Guidelines for Dredging (2009)

- National Strategy for Ecologically Sustainable Development (1992)
- Queensland Biosecurity Strategy 2009-14
- Queensland Coastal Plan
- Queensland Coastal Contingency Action Plan (QCCAP)
- Queensland Ports Strategy 2014
- Standards for Hydrographic Surveys within Queensland Waters
- State Development Assessment Provisions (SDAP)
- State Planning Policy 2016
- State Planning Regulatory Provisions (SPRP)
- Transport Operations (Marine Pollution) Regulation 2008.

Approvals

The project and its components are located in areas under the jurisdiction of the Commonwealth Government, the Queensland Government and the Cairns Regional Council and associated approvals include the following:

Commonwealth Government

- Approval of the relevant 'Controlled Actions' under the EPBC Act
- Native title clearance for proposed use of land where native title has not been extinguished requires notification under section 24KA of the *Native Title (Queensland) Act 1993* (Qld).

State Government

- SDPWO Act - The Coordinator General will prepare an evaluation report on this revised EIS and determine whether the project can proceed subject to conditions or should be refused
- Approval under the *Aboriginal Cultural Heritage Act 2003* - A Cultural Heritage Management Plan (CHMP) will need to be approved by the Department of Environment and Heritage Protection.
- State Marine Parks Permit - Compliance with guidelines set out in the GBRMPA Dredging and Dredge Spoil Material Disposal Policy 2016, Environment and Heritage Protection
- Operational Works in a declared Fish Habitat Area (FHA), including an application to amend the boundaries of declared FHA under DAF Operational Policy *Marine Resource Management: Fish Habitat Area selection, assessment, declaration and review*.

Cairns Regional Council

Approvals for Assessable development under the Planning Scheme *CairnsPlan 2016*

- Operational Works in a coastal management district (tidal works)
- Development application for land placement of dredge material on the Barron Delta
- Development application for certain aspects of Operational Works for the delivery pipeline

ES.B.1 Land

Existing Situation

Landside Works Project Area

The Landside Works Project Area is located on freehold and leasehold land within the current Seaport Local Area and the Waterfront Industry Planning Area defined under the Ports North Land Use Plan. The land abuts Trinity Inlet and is largely developed for port activities. This area contains the current Cairns Cruise Liner Terminal (CCLT) and has strong linkages with the Cairns CBD.

There are few soils-related issues. However, it is likely that acid sulfate soils will be encountered during minor excavations for services and it is known that some contaminated land is present in this area. Management and remediation of these constraints is straightforward.

Northern Sands Project Area

The Northern Sands DMPA is located on part of the current freehold Northern Sands site adjacent to the Barron River. It contains the existing water-filled void created by past sandmining and cleared stockpile and works areas. Soils on the site are generally alluvial and will be subjected to minor disturbance. It is possible that acid sulfate soils may be encountered in this area and these will be managed as required.

The terrestrial component of the delivery pipeline corridor starts at the mouth of Richters Creek and crosses land generally developed for sugar cane farming, with a few patches of natural vegetation adjacent to the coast and along Richters Creek. As the pipeline will be above ground there will be little disturbance of soils during the construction process.

Tingira Street Project Area

The Tingira Street DMPA is located adjacent to Smiths Creek on a freehold lot owned by Ports North. It has previously been cleared and filled with construction waste to about high water level. After the placement of stiff clay from the dredging process (which will raise the level of the land by some 1 to 2m), the land is proposed to be further capped with gravel material and used for industrial purposes in accordance with current planning. Some approvals exist for this future work which does not form part of the CSD Project.

Impact Assessment Findings

Construction

There are likely to be some low-risk soils-related construction impacts at the Northern Sands DMPA, generally related to minor instability issues, erosion and sedimentation, and possible disturbance of acid sulfate soils. Impacts at the other project areas are likely to be negligible.

Operation

At the completion of the CSD Project, the Northern Sands DMPA will return to the control of the owner for continuation of existing uses and The Tingira St DMPAs will be further developed for industrial use by Ports North in accordance with its Land Use Plan. The completed works at the Landside Works Project Area will not involve any operation impacts on soils. Operation of the CCLT and associated waterside facilities will continue as per the current situation.

Residual Risk and Mitigation

Based on the assessments undertaken, all impacts to Land (soils and land use) can be reduced to a low or negligible residual risk through the application of controls and commitments included in the various management plans contained in Part C of the Revised Draft EIS.

There are some beneficial impacts in the Landside Works Project Area in terms of implementing current waterside planning and the remediation of contaminated land. In addition, the partial filling of the Tingira Street DMPA by the stiff clay will remove the need to acquire and import approximately 100 000 m³ of fill from elsewhere to complete the already planned earthworks.

ES.B.2 Nature Conservation Areas

Existing Situation

The study area contains a number of protected areas declared under Commonwealth and Queensland legislation and these are jointly referred to as Nature Conservation Areas. Together these have values that include:

- world heritage values that are subject to international agreements
- habitat for species of conservation significance (plants and animals)
- habitat for species of commercial (e.g. fishing) significance
- integrity and the maintenance of ecological processes (e.g. water quality, tidal flushing, nutrient cycling)
- landscape quality /scenic amenity (e.g. landforms, coastal vistas)
- various types of nature-based recreation and commercial businesses based on these.

Nature Conservation Areas found to be relevant to the impact assessment are:

- Great Barrier Reef World Heritage Area and National Heritage Place
- Great Barrier Reef Marine Park (outside the dredging footprint)
- Port of Cairns and Trinity Inlet Wetland (a Nationally Important Wetland)
- Great Barrier Reef Coast Marine Park (Qld)
- Trinity Inlet and Yorkeys Creek Fish Habitat Areas.

Impact Assessment Findings

Construction

Construction activities affecting Nature Conservation Areas are associated with channel dredging and the construction of the Northern Sands DMPA delivery pipeline where it crosses the mouth of Richters Creek and at the second crossing part way towards the DMPA. Arising from these activities there are likely to be low residual risks to soft bottom benthic habitat in the dredge footprint (with full recovery within 6-24 months). Tailwater discharge into the Barron River from the Northern Sands DMPA is unlikely to have any salinity or turbidity impacts on recovering seagrass areas in Trinity Bay. All construction impacts are local in scale and are of short duration.

Operation

The operation of the CSD Project will have negligible impact on Nature Conservation Areas, although the channel enlargement will encroach on approximately 9 ha of the Trinity Inlet Fish Habitat Area. Agreement in principle has been reached with the Queensland Government for a corresponding area to be added by way of compensation. Internal zone boundaries of the State marine park will require minor amendment to accommodate the extension of the channel into what is currently the Estuarine Conservation Zone.

Residual Risk and Mitigation

Based on the assessments, all impacts to Nature Conservation Areas are or can be reduced to a Low or Negligible residual risk through the application of controls and commitments included in the various management plans contained in Part C of the Revised Draft EIS. The residual risk of impact on the Great Barrier Reef as a whole has been assessed as Negligible.

ES.B.3 Coastal Processes

Existing Situation

Currents within Trinity Bay are predominantly driven by a combination of:

- Tide
- Wind, acting at both regional and local scales
- Non-tidal water levels and currents in the adjacent Coral Sea.

Within the study area the tide and locally acting wind are generally the most significant drivers of both regional and local scale currents.

The study area is dominated by trade winds from the south to east-south-east sectors. Cape Grafton shelters the beaches from the south-easterly waves, and waves approaching the study area from the east-south-east are refracted as they propagate into Trinity Bay. Waves are the key driver of elevated turbidity in shallow waters throughout the study area.

Trinity Bay contains deposits of mid-Holocene (approximately 5,000 to 7,000 years ago) and younger land-sourced terrigenous sediments of sand and mud up to 20 m in thickness and prograding seawards at rates of up to 1 m per year, continuing today. This suggests that Trinity Bay is naturally accumulating sediments.

Seabed sediments in the study area have their origin predominantly in the fluvial supply from the Barron River.

Deposition of sand is limited largely to the close-in nearshore areas adjacent to the Barron River mouth, from whence it tends to be moved shoreward and alongshore by wave action. Correspondingly, contemporary sediment deposition in deeper water is predominantly the finer (muddy) suspended wash load from the river, forming a high proportion of mud on the seabed.

Discharges of Barron River catchment loads are typically associated with floods caused by tropical cyclone rainfall events. The resultant plumes deliver sediment, nutrients and pollutants to the GBR lagoon and reefs. Most of the Barron River sediment load accumulates in Trinity Bay and contributes to a seaward advancement of the muddy shoreline. Mangroves rapidly colonise the advancing mudflat and act to stabilise the shoreline and enhance sediment trapping.

Impact Assessment Findings

Construction

Construction impacts on coastal processes could occur from establishment of the temporary dredge pipeline and discharge of supernatant tailwater from the Barron Delta DMPA.

The temporary dredge material pipeline to be placed on the seabed (expected to be in place no longer than six months) would not be expected to be very efficient at trapping the predominantly fine-grain offshore sediments. The effect of any temporary trapping would be alleviated following removal of the pipeline. Given the dynamic nature of the area, the physical characteristics would be expected to rapidly recover (i.e. local beach morphology and sediment characteristics within the range of natural variation) on completion of these beach disruption works.

In regard to tailwater discharge from the Barron Delta DMPA, modelling indicates that there is negligible impact predicted to existing Barron River tidal flows due to this relatively minor magnitude of tailwater discharge. The river bed and bank stability of the Barron River should also be unaffected, with the potential exception of localised effects. Depending on the location and arrangement of the tailwater discharge outlet, there may be the potential for flows to impinge on erodible river bank sediments with potential to cause localised scour impacts. The potential for such localised scour impacts and mitigation options would need to be addressed during Project detailed design.

Operation

The various coastal processes assessments have shown that impacts of the Project will not be of significance with respect to the adjacent shoreline areas. The impacts predicted using calibrated numerical models show relatively minor changes to coastal processes, typically within the immediate vicinity of the shipping channel. In reality, the magnitude of impact would not be detectable and is well within the natural, background conditions. As such, long term adverse impacts to coastal processes are highly unlikely.

Wave propagation modelling indicates there would be no changes in wave heights of any significance at adjacent shoreline areas associated with the proposed channel development. Under typical swell and sea state conditions, the absolute wave height levels along the adjacent shorelines within Trinity Bay are not affected.

Specially, the modelling assessment results show that:

- Generally, impacts on tidal currents are highly localised and in the immediate vicinity of the target dredge area where some local realignment and modification of current speeds will occur
- There will be minor (unmeasurable) impact to currents and tidal flows in Trinity Bay and Trinity Inlet
- There will be no detectable increase to storm tide vulnerability to adjacent areas
- There will be no substantive change to flood plume conveyance from Trinity Inlet

- There will be minor (unmeasurable) modification to wave propagation in the vicinity of the developed channel area and no detectable impact to wave conditions at far field areas
- There may be an increase of approximately 2 to 6% to the annual channel siltation and maintenance dredge requirements
- There will be no detectable impact to sediment transport pathways and beach processes.

Residual Risk and Mitigation

Based on the assessments, most risks to coastal processes can be reduced to a low or negligible residual risk through the application of controls inherent of the Project design. The exception is the minor increase in maintenance dredging, which has a medium residual risk.

Proposed mitigation includes monitoring and reactive sand bypassing for the temporary dredge pipeline during the construction phase, and addressing potential local scour impacts from tailwater discharge during detailed design.

ES.B.4 Sediment Quality

Existing Situation

The findings of sediment testing and historic data indicate that outer channel and inner port sediments are typically characterised by a large proportion of silts and clays and a low proportion of sands.

The 95% UCL of all potential contaminants of concern (i.e. metals and organic contaminants) from Inner Port and Outer Channel sites are below the relevant NAGD screening levels, with the exception of total mercury concentrations. However, elutriate and bioavailable concentrations of total mercury are below relevant ANZECC/ARMCANZ (2000) default marine water quality guidelines and NAGD screening levels. This assessment is in-line with results of annual maintenance dredging sediment sampling and analysis findings that dredge material was suitable for unconfined marine placement between 1995 and 2016.

Preliminary ASS investigations of the proposed dredge material was also undertaken by Golder (2012 and 2013), with further ASS testing also undertaken as part of Phase II assessments (BMT WBM 2014) and again in 2016 by Golder (2016 and 2017). PASS is expected to be present in the very soft to soft clay and silt materials, which represent ~250,000 - 320,000 m³ of the proposed dredge volume (Golder, 2017).

The remaining material (~460,000 – 580,000 m³) is expected to be self-neutralising clay material. Stiff clays, which represent approximately 80,000 m³ – 100,000 m³ of the total proposed dredge volume, have been confirmed as non-ASS by Golder (2017).

Impact Assessment Findings

The baseline assessment concluded that the dredge material is unlikely to contain potential contaminants of concern (i.e. metals and organic contaminants) above the relevant NAGD screening levels. Therefore, it is unlikely that concentrations of contaminants of concern released during dredging pose any significant risk to the surrounding marine environment.

Changes in pH due to disturbance and exposure of ASS to the atmosphere can lead to water quality impacts. PASS is expected to be present in the very soft, to soft clay, and silt materials. However, there is negligible risk of ASS impacts predicted from the dredging activity (i.e. disturbance of PASS at the dredge head) as there are no pathways for oxidation in seawater. Once the material is in the dredge hopper, under normal operating conditions of the TSHD, the dredge material remains waterlogged in the hopper for a matter of hours, therefore the risk of oxidation is negligible. At the TSHD dredge pump-out location, the dredge material will be pumped via enclosed pipeline into a void filled with water, ensuring the dredge material is waterlogged at all times and hence unable to oxidize and result in pH changes..

PASS will be managed appropriately in the Barron Delta DMPA such that tailwater discharges into the Barron River are at a neutral pH with negligible impacts.

Therefore, in terms of sediment quality, the potential impacts from sediment disturbance from dredging are considered to be short-term and negligible.

Future maintenance dredging and dredge material placement during the operational phase of the project will be undertaken in accordance with NAGD, or future versions of these guidelines.

Residual Impacts and Mitigation

Based on the assessments, all impacts to marine sediment quality can be reduced to a negligible risk through the application of standard mitigation measures included in the Dredge Management Plan in Part C of the Revised Draft EIS.

ES.B.5 Marine Water Quality

Existing Situation

Existing baseline marine water quality in the study area is characterised by some exceedances of water quality guideline values. However this is not unexpected of a marine environment located adjacent to an urban/industrialised area. The range of anthropogenic sources that influence inshore marine areas such as Trinity Inlet are common along the Queensland coast.

In regard to turbidity, the near shore areas of Trinity Bay are naturally turbid environments, especially following periods of high rainfall and sustained winds and currents. However, this is to be expected in near shore areas such as Trinity Bay with shallow water depths and muddy benthic sediments which are susceptible to re-suspension. In deeper waters further offshore, the turbidity is relatively low due to less re-suspension of bottom sediments.

Assessment of the full baseline water quality dataset indicated the following:

- Seasonal assessments of TSS and turbidity for the study area as a whole do not reveal any significant variation between wet and dry season. However, there appears to be some correlation between exposure to south-easterly winds and increased turbidity for some sites (e.g. Northern Beaches). Turbidity in other more protected areas (e.g. Trinity Inlet, False Cape) appears to be more likely influenced by freshwater inflows during the wet season.

- During the wet and dry seasons, turbidity levels generally increased from the Trinity Inlet out to near shore areas (False Cape, Cape Grafton and the Northern Beaches). Turbidity was relatively low (<10 NTU) at offshore areas during both seasons.
- All monitoring locations demonstrated median turbidity levels in excess of the nominated water quality objective for both seasons, with the exception of Trinity Inlet during the dry season.
- Salinity in the Barron River typically ranged between about 5 ppt and 30 ppt. Salinity in the Barron River can become very fresh (about 0.1 ppt) for short periods of time after rainfall events, however in general, the Barron River is brackish with salinity typically around 20 ppt for most of the time.

Impact Assessment Findings

Project-specific threshold values and 'zones of impact' as recommended by the Commonwealth EIS Guidelines and GBRMPA Modelling Guidelines have been developed to assess potential impacts to marine water quality. The predicted impacts on water quality from the capital dredging and placement on land are presented in the context of a likely best case and a likely worst case.

Dredging of Inner Port

Median turbidity levels are predicted to increase slightly (up to 4 NTU) within Trinity Inlet. 95th percentile turbidity is predicted to increase up to 10 NTU above background 95th percentile conditions in Trinity Inlet for a period of 12 weeks.

A zone of influence (i.e. extent of detectable plumes but no predicted ecological impacts) is predicted to extend from the inner port southwards along Trinity Inlet to areas that historically supported seagrass. A zone of low to moderate impact is predicted to extend approximately 2 km southwards along Trinity Inlet and approximately 2 km northwards adjacent to the channel (but not within historic seagrass meadows) only under a likely worst case scenario.

Based on the impact assessment overall, short- term minor impacts are expected from turbid plumes generated from capital dredging in the inner port.

Dredging of Outer Channel

Median turbidity levels are expected to increase slightly (up to 6 NTU) due to dredging of the outer channel. 95th percentile turbidity is predicted to increase by approximately 10-30 NTU above background 95th percentile conditions.

A relatively small zone of low to moderate impact is predicted to occur near the bend in the channel close to the inner port area. A zone of influence is predicted to occur for the remaining areas in the vicinity of the outer channel dredging.

The model outputs suggest that under the likely worst case scenario, turbid dredge plumes are predicted to be slightly increased in the near shore environment along the coastline to the north of the dredging area and to the east towards Cape Grafton (these plumes would be detectable with instrumentation but may not be visible to the naked eye). However, marine water quality is not predicted to change significantly.

Based on the impact assessment overall, short- term minor impacts are expected from turbid plumes generated from the capital dredging in the outer channel.

Tailwater Discharge from Barron Delta DMPA

In terms of turbidity impacts, the discharge of tailwater is expected to result in only a minor increase in turbidity, resulting in a zone of influence in the Barron River, but no zones of impact predicted.

In terms of salinity, tailwater discharge is predicted to increase salinity by about 1-3 parts per thousand (ppt). However, this magnitude of increase is relatively minor in the upper reaches of the Barron River and Thomatis / Richters Creek (increases of approximately 7% - 25%), and almost imperceptible in the lower reaches of the Barron River. It should be recognised that the Barron River and Thomatis / Richters Creek are typically subjected to fluctuating salinity levels due to a strong tidal influence and the relatively minor salinity increases from tailwater discharges pose minimal risk to the salinity regime of these waterways, particularly considering the short-term duration of tailwater discharge (~12 weeks).

Therefore, based on this assessment, the potential impacts to marine water quality from tailwater discharges are expected to be short-term and minor.

Residual Risk and Mitigation

To mitigate potential marine water quality impacts, the Dredge Management Plan in Part C of the Revised Draft EIS will be implemented which includes measures to minimise sediment loads from dredging, as well as implementation of a reactive water quality monitoring program (capital dredging and tailwater) during the construction phase of the project. Implementation of mitigation measures will reduce all impacts to marine water quality to a low or negligible residual risk.

ES.B.6 Water Resources

Existing Situation

There are no significant surface water resources likely to be affected by the CSD Project. Groundwater resources of any importance are limited to the Northern Sands Project Area as there is substantial use of the resource for irrigation and domestic purposes. In rural areas some bores are used to fill shallow dams used for agriculture.

Twenty-four registered bores are located within 2 km of the Northern Sands site. While some bores have substantial yields, the potential for use of this water for various beneficial uses is impacted by the salinity of the groundwater. Poor water quality is observed up to 3 km from the coast.

The Northern Sands site is underlain by an upper unconfined aquifer and a lower confined or semiconfined aquifer. Both of these aquifers extend broadly across the Barron River delta and at the Northern Sands site, the upper unconfined aquifer includes a 3 m to 5 m thick clayey layer, which may or may not be laterally continuous.

The upper aquifer is recharged directly by rainfall and is intersected by the existing water-filled void (known locally as Lake Narelle). The water level in this lake varies seasonally.

The overall direction of groundwater flow in the upper unconfined aquifer is towards the Barron River and Thomatis / Richters Creek. Close to these streams, groundwater exchange will occur as a result of tidal fluctuations in the streams. Groundwater flow in the deep confined aquifer is towards the coast. Recharge to this aquifer occurs further to the west where the confining layer is absent in some areas.

Impact Assessment Findings

Construction

There is negligible risk of impact on surface waters in all project areas and groundwater impacts are limited to the Northern Sands DMPA. At this site, the gradual filling of the mining void with the soft clay slurry will displace the existing fresh water and initially force saline water that accompanies the soft clays into the surrounding groundwater. The rate of this lateral outflow will be substantially reduced once the soft clays 'smear' the sides of the void and significantly reduce their permeability.

Modelling has predicted that there will be an increase in salinity on the groundwater adjacent to Northern Sands laterally up to about 120 m. It is expected that salinity levels will return to normal within two years of the cessation of placement. Impacts on the Barron River will be negligible as it currently contains fluctuating salinity levels. There is a low risk of seepage under the bunds that will contain the placed soft clays as they settle. While this could affect their stability, mitigation is feasible and expected to be effective.

Operation

Operation phase impacts on surface water and groundwater are limited to the Northern Sands DMPA. Groundwater salinity adjacent to the site will gradually return to normal over a period of about two years..

Residual Risk and Mitigation

Based on the assessments, all impacts to surface water and groundwater are Negligible. Risks to groundwater are limited to the Northern Sands DMPA and generally can be reduced to a Low or Negligible residual risk through the application of controls and commitments included in the various management plans contained in Part C of the Revised Draft EIS. The exception is lateral migration of saline water away from the DMPA causing increased salinity in the upper unconfined aquifer. This cannot be mitigated and will involve Medium risk for two years, after which salinities will return to normal. The 120 m radius of impact contains no current bores and is limited to a small strip of agricultural land east of the Captain Cook Highway.

ES.B.7 Marine Ecology

Existing Situation

The study area contains the following important marine and estuarine ecological values:

- A wide diversity of marine habitat types including sandy beaches, mangrove forests, saltmarshes, intertidal shoals, seagrass meadows, subtidal soft sediment habitats, rock walls and rocky shores
- An extensive area of mangroves exhibiting a range of species and community types, some of which are limited in their distribution elsewhere
- Seagrass beds that represent one of the only two major seagrass areas between Hinchinbrook Island and Cooktown
- Mangroves, saltmarsh seagrass meadows and ‘unvegetated’ soft sediment habitats and other associated wetlands that have been recognised as important nursery areas for juvenile fish and prawns of commercial importance
- Habitats for a wide range of fish and shellfish species of direct economic significance
- A range of habitat types that significantly underpin the biodiversity values of the region
- Potential feeding areas for marine turtles, dugongs, whales and dolphins, which are listed as threatened or migratory under Commonwealth and/or Queensland legislation.

The proposed dredge area(channel and swing basins)is mostly unvegetated with benthic communities that are regularly disturbed by maintenance dredging and propeller wash.

Impact Assessment Findings

Direct impacts – Capital Dredging

No reef communities or other features of high fauna biodiversity value occur in the existing channel or proposed dredge areas. The dredge footprint does not presently support seagrass meadows, however approximately 9 ha of the dredge footprint overlaps with seabed areas that have previously supported seagrass and as such, these areas represent potential habitat for seagrass. Of the 9 ha of historic seagrass within the new channel footprint, 6 ha of this falls within the existing footprint. The total area of potential seagrass habitat in the footprint is ~ 1% of the cumulative historical extent of seagrass meadows in the Cairns region and ~2% of the meadow extent mapped in 2015.

Initially, dredging will cause a temporary loss of the soft bottom benthic biota from within the dredge footprint, since benthic communities typically inhabit the surface sediments that will be extracted by dredging. Biota will soon recolonise the dredge footprint but will continue to be regularly subject to similar disturbance through the ongoing annual maintenance dredging regime.

While in this modified state, it would be expected that benthic communities within both the existing channel/harbour and proposed new dredge areas will support similar benthic communities and ecological functions as that currently found in the existing channels.

Initial passive recolonisation of dredged areas may occur immediately after dredging, followed shortly by the commencement of recolonisation through larval dispersal or active invasion (within hours to days) (WBM 2004). While initial recolonisation will occur in a short time frame, 'recovery' (a return to comparable numbers of species and total individuals) would be in the order of months to years (i.e. 6-24 months).

Indirect Impacts – Water Quality

The zones of impact do not coincide with any coral reefs (e.g. Rocky Island and Double Island) under best or worst case scenarios. While the zone of Influence coincides with coral reefs, this zone includes areas where detectable turbidity changes could occur, but adverse ecological effects are not expected.

Zones of impact in terms of sediment deposition are not expected to intersect with any known reefs. On this basis, impacts to coral communities are expected to be low.

The zone of influence also coincides with known (as mapped in 2015) and historic seagrass meadows, however impacts are not predicted in this zone. There is a zone of high impact located within the channel that intersects areas that have previously supported seagrass, but does not intersect areas presently supporting seagrass. There is a zone of low to moderate impact predicted to occur adjacent to the channel, but this zone does not coincide with any past or present seagrass distributions even during the worst case scenario. Sediment deposition rates are predicted to be well below seagrass thresholds, except in the dredge channel, which does not presently support seagrass. On this basis, impacts to seagrass communities are expected to be low.

In terms of tailwater discharge into the Barron River, significant impacts to benthic marine invertebrates or species of commercial fisheries significance are not expected as a result of suspended sediments in tailwater. Furthermore, impacts are not expected to riparian or benthic fauna communities from saline tailwater discharge, as salinity is predicted to increase marginally and these communities regularly experience full seawater salinity conditions.

Secondary Impacts – Marine flora and fauna

The change in habitat conditions in the dredge channel is predicted to have highly localised secondary effects to marine flora and fauna. Alterations in the composition and abundance of benthic fauna assemblages can be expected within the dredged area immediately after dredging (i.e. prior to recolonisation), resulting in a temporary loss of prey items for fish and invertebrates in the dredge footprint, which represents a minor impact.

Longer term changes in habitat conditions (e.g. sediment types, water depths) as a result of dredging, and associated changes to benthic macroinvertebrate communities, are not expected and will not lead to significant impacts.

Impacts to Marine Megafauna

The overall risk of impact to key marine megafauna species including dolphins, whales, dugongs and sea turtles (most of which are MNES) is low; noting that key foraging habitats for these species (reefs, notable seagrass beds) generally do not coincide with the predicted extent of turbidity impact zones.

Residual Risk and Mitigation

Mitigation measures that will be adopted to minimise direct impacts to marine flora and fauna include:

- monitoring that will be undertaken to validate impact predictions outlined in the EIS;
- a reactive monitoring program comprising both physical chemical and biological monitoring components which is to be implemented before and during dredging and placement and used to manage the extent and location of overflow dredging.
- a commitment to undertaking the two-month capital dredging campaign outside of critical periods to minimise impacts on likely seagrass growing periods and other ecological factors

Based on the assessments and through implementation of mitigation measures, all impacts to marine ecology can be reduced to low or negligible risk.

ES.B.8 Terrestrial Ecology

Existing Situation

There are negligible ecological values at the Landside Works Project Area. At the Tingira Street DMPA, previous clearing and filling has reduced ecological values, although the low-lying sections of the site are used by wading birds for limited periods when inundated by high tides or rainfall. Some regrowth vegetation is present, consisting of highly disturbed anthropogenic (man-made) grassland, marine plants around the edges, and many exotic species.

The Northern Sands DMPA site is almost totally cleared, with some mangrove and Melaleuca woodland remaining on the banks of the Barron River. Lake Narelle has some ecological value as habitat for birds and fish and anecdotally contains a crocodile.

Along the delivery pipeline corridor there are patches of Corymbia/Melaleuca woodland adjacent to the mouth of Richters Creek and a small strip of mangroves along the banks of Richters Creek at the upstream crossing point. The balance of the pipeline route crosses cane fields west of Holloways Beach.

Only one listed threatened plant species, the Vulnerable Ant plant (*Myrmecodia beccarii*) was recorded during the site surveys. This species was recorded within the mangrove vegetation associated with Richters Creek along the delivery pipeline corridor. Only one listed animal species was recorded, namely the Vulnerable Spectacled flying-fox (*Pteropus conspicillatus*). This was recorded foraging in the mangroves on the Northern Sands Project Area in both the wet and dry season ecology surveys.

Ten migratory species (not listed as threatened species) were recorded, and based on knowledge of the species and the available habitats, 11 species are likely to occur on or around the two DMPAs. The migratory species recorded are principally waders, shore-birds, and species typical of wetland and tidal ecosystems, and common aerial species. Neither DMPA site is an internationally or nationally important site, nor is it defined as 'important habitat' for the 37 migratory shorebird species covered by *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth).

Impact Assessment Findings

Construction

Impacts during construction will be limited to minor clearing along the delivery pipeline corridor (the pipeline will be micro-located on site to avoid any natural vegetation wherever possible) and at the Tingira Street DMPA where anthropogenic grassland and some marine plants around the edges may be cleared. The void will be completely filled with the soft clays.

Operation

Following completion of the placement program, the former Lake Narelle will have little if any ecological value. Any impacts along the delivery pipeline corridor will be short term as cleared areas will be rehabilitated and Ant plants translocated. The Tingira Street DMPA is scheduled for further filling in the future (not as part of the CSD Project) which means that the small contribution (< 4 ha) it makes to bird habitat will be ultimately permanently lost.

Residual Risk and Mitigation

Based on the assessments, most impacts to terrestrial ecology values are or can be reduced to a Low or Negligible residual risk through the application of controls and commitments included in the various management plans contained in Part C of the Revised Draft EIS. Placement of stiff clay at the Tingira Street DMPA will result in the permanent loss of a small area of wading bird habitat at the Tingira Street DMPA (although there is ample suitable habitat close by (e.g. at East Trinity) and the habitat on the site is not unique or critical to the species local persistence).

The remaining residual Medium risks pertain to a small area (<0.5 ha in total) of marine plants (also mapped as wetlands) along the delivery pipeline corridor (although this area will be rehabilitated) and 0.8 ha at the Tingira Street DMPA. The Tingira Street DMPA is scheduled for redevelopment in any case as an unrelated project.

ES.B.9 Socio Economic

Social Impacts

Future possible impacts of the proposal were identified through a process of prediction based on the profile of the existing social environment including surrounding land uses, the nature of the proposed development, review of documentation on community character and values, and the findings of consultation.

The SIA found that there would be the following potential adverse impacts:

Barron Delta DMPA

- a minor temporary change in the coastal area from the establishment and operation of a pipeline making landfill near the mouth of Richters Creek
- a minor temporary change in the amenity of residents in nearby suburbs, including those overlooking the Barron Delta DMPA and those in the northern part of Holloways Beach
- a minor temporary change in the use of the beachfront and creek mouth of Richters Creek by a small number of users, and a minor threat to safety and wellbeing which could be mitigated by appropriate fencing and signage
- some temporary minor restrictions to recreational fishing and boating on Richters Creek, and to the amenity of the creek environment

Tingira St DMPA

- only negligible adverse impacts.

Other areas

- a minor impact of land based wharf upgrade construction works, dredging and change in number of ship arrivals on residents in the Wharf St area, and a moderate impact long term as a result of increased ship arrivals
- in relation to the change in number of ship arrivals at Yorkeys Knob a minor adverse impact on local business and tourism operators, and the Boat Club, in the short term, but a beneficial impact long term,.

Positive beneficial impacts were found likely to include:

- a beneficial impact short term for ship passengers and crew, and long term for local business and tourism operators, and the Boat Club, in relation to an increased number of ship arrivals at Yorkeys Knob.
- a beneficial impact in the short term for the landowner of the Barron Delta DMPA
- a compatible land use in the Tingira St DMPA area, which would result in the provision of additional port industrial land

A risk rating analysis identified that there were no high or extreme risks relating to social impacts of the proposal, and only one medium risk during construction as follows:

- establishment of the pipeline and laydown area changing the character of the coastal area

and two during operation as follows:

- the increased number of ship arrivals affecting the amenity of residents in the Wharf St area
- the decreased number of ship arrivals in Yorkeys Knob in the short term affecting business and tourism operators, and the Boat Club.

Conversely five extremely or highly positive likely outcomes during operation were identified.

Residual Risk and Mitigation

The mitigation measures inherent in the proposal have been found to be extensive. There are nevertheless some possible opportunities to further mitigate adverse impacts and to enhance some beneficial impacts. Other opportunities which may further reduce social impacts have been proposed by visual, noise, air quality and traffic assessments.

Overall, the adverse social impacts identified have generally been found to be negligible or minor. The majority are temporary in nature. There was only one impact that was identified as potentially moderate. Several beneficial impacts were also identified. From a social perspective, there are no concerns which would warrant the project not proceeding.

Economic Impacts

The Economic Impact assessment found that:

- The CSD Project has been strategically positioned to take advantage of opportunities presented by cruise ship sector growth and respond to the Queensland Governments renewed focus on developing Queensland's strengths in tourism.
- The current CSD Project proposal directly facilitates increased tourism opportunities in FNQ and supports the overall growth of the cruise ship sector in Queensland. The proposed CSD Project builds upon existing infrastructure providing an expanded major attractor and offering additional marketing opportunities to promote and downstream.
- This improved cruise ship infrastructure in Cairns will result in considerable benefits to the local Cairns economy and the Queensland cruise industry. This includes community benefit that extends over and above the significant contributions that will result through Project delivery, which will:
 - Generate an estimated NPV of \$849M total value added to the Cairns economy (2016 to 2043 discounted to \$2016-17 at a 7% real discount rate);
 - Create 802 new direct and indirect jobs during construction; and
 - Create over 2,730 new direct and indirect jobs upon completion

- The Project will generate substantial economic investment, new jobs and major new infrastructure. Ultimately the CSD Project will improve the competitiveness of Cairns and QLD through:
 - Supporting local employment and growth industries;
 - Increasing the competitiveness of the region over alternate destinations due to an increased capacity to do business; and
 - Strengthening the economic resilience of the local economy, via the delivery of a wider distribution of both the location and industry composition of jobs.

ES.B.10 Noise and Vibration

Existing Situation

Baseline noise monitoring has been conducted at sensitive receptor locations nearby the key construction elements of the project including pipeline fabrication area, pipeline route, booster locations, DMPAs and wharfs 1-5. The following background noise environment conditions were noted:

- The dominant noise source at residences north of the Barron Delta DMPA is road traffic noise on the Captain Cook Highway, aircraft noise (semi regular events) and insects.
- The noise environment at the northern part of the Holloways Beach community is representative of a quiet residential area. Insect noise influences the noise environment.
- The existing noise environment to the north of Abbott Street is heavily influenced by traffic on Wharf Street and mechanical plant associated with the Jack & Newell Apartments and the Pullman Hotel. In the absence of traffic noise, mechanical plant (exhaust air fans) noise is the dominant noise source.
- Noise monitoring at Piermonde Apartments indicates that the apartments at higher levels are also influenced by mechanical plant noise.
- The nearest sensitive uses to the proposed Tingira Street DMPA sites are a college and office buildings; background noise sources are industrial plant, machinery, traffic, car and boat traffic.

Impact Assessment Findings

Noise impact assessments and mitigation strategies were based on preliminary locations of project elements and assumed plant and machinery specifications and emissions; these assessments however will inform development of detailed construction plans and plant and machinery selection once contractors are appointed.

Key findings of the noise impact assessments include:

Pipeline Commissioning and Decommissioning

- Noise from the pipe fabrication area is predicted to be compliant with the noise level targets at all receptors.
- Noise from sandbar cutting is predicted to slightly exceed (up to 4 dB) the construction noise level targets during adverse conditions.
- Noise from the dozer and excavator crew is predicted to exceed the noise limits at numerous receptors during both neutral and adverse conditions. The highest exceedance is up to 13 dB at the closest receptor to the pipeline route, however the predicted noise level is well below the highly affected noise level of 75 dBA $L_{eq}(15 \text{ minute})$.
- The cumulative noise levels also exceed the noise criteria at numerous receptors during both neutral and adverse conditions. The predicted cumulative noise levels are dominated by noise from the dozer and excavator crew, with noise from the fabrication area having only a minor influence on the overall noise level at some receptors.
- It is also noted that as the pipeline will be built during cane harvesting season, it is possible that noise from the pipeline construction may not be discernible from cane harvesting operations at some locations.
- Overall, it is expected that noise emissions from pipeline construction and decommissioning will not significantly impact sensitive receptors.

Booster Pump Stations

- Predicted noise levels comply with the night-time noise level targets under neutral conditions, but exceed the night-time noise level targets at three receptors under adverse conditions. The predicted noise exceedance under adverse conditions is 0 to 3 dB. These boosters are proposed to only operate for 40 hours per week.
- Overall the level of these exceedances is considered minor, and it is expected that further mitigation (i.e. bunding or quieter plant selection) will result in compliance with the noise level targets.
- A detailed assessment of noise emissions from the booster pumps will be required when pump selections, the number of stations required is confirmed, and potential locations for the stations is confirmed.

Northern Sands DMPA

- The preparation of the DMPA (construction of earth bunding) will be undertaken by the existing operational quarry as part of its 'business as usual' operations. Construction will be during the daytime only and use equipment such as dozers and excavators which are typically used in a quarry or on farms in the area – but for extended periods during bund construction.
- Overall it is expected that if the tailwater is to be pumped from the placement pond, with a pump located at the southern extent of the placement area it is likely that noise emissions from the pump will be compliant at sensitive receptors, and minimal mitigation would be required. However, if an additional tailwater pond is required, and the pump is required to be located towards the northern boundary of the DMPA more detailed consideration of noise mitigation will be required.
- It is recommended that an assessment of tailwater pump noise is undertaken when the exact location of the pump is known, and when the pump model has been selected.

Tingira Street DMPA

- Based on the anticipated construction time of up to 5 weeks and the compliance with the adopted ICNG levels, it is considered that noise levels will not significantly impact the college and offices and risks are considered to be low.
- There are no sensitive receptors in the vicinity to be exposed to the evening and night noise from the placement activity. Dredging of stiff clay adjacent to sensitive receptors in the CityPort area will be restricted to daylight hours to avoid nuisance.

TSHD Pump- Out Facility

- It is noted that the predicted noise level from the TSHD pump-out by itself is compliant, however the influence of the booster stations resulting in an overall noise level which exceeds the night-time noise level targets.
- Overall the level of the predicted exceedances is considered moderate. It is expected that further mitigation to achieve compliance would be possible, however it is noted that the critical factor will likely be attenuation of the booster pump stations.

A detailed assessment of noise emissions from the booster pumps and TSHD pump-out process will be required when pump selections, the number of stations and their locations, is confirmed

Wharf Construction

- It is expected that construction will comply with the construction noise level targets at sensitive receptors near the wharf if construction is limited to standard construction hours as is proposed.
- It is expected that noise from piling has the potential to impact sensitive receptors. Accordingly, piling will only be undertaken during standard construction hours.
- Vibration from other construction activities and operational activities was otherwise considered minor or insignificant.

Operational Noise

Cruise ship operational noise assessment undertaken in the Draft EIS concluded that whilst some exceedances of noise criteria were predicted, they were considered acceptable on the basis that noise levels are generally not increasing and there have been no complaints regarding the existing noise levels. A further review of the noise levels indicates that noise level exceedances are nil or relatively small when compared to alternative criteria determined on the basis of achieving internal noise levels with doors/windows closed. Therefore, it could be considered that on the basis of these alternative criteria, and the outcome that noise levels will not be increasing, that the impacts are acceptable.

In addition, noise impacts from ship arrival/departure at Trinity Inlet receptors are not expected to be significant. This is because ship arrivals will only occur once per assessment time period (i.e. a single noise event); will generally not occur during the night time period; and because the location of receptors adjacent to the shipping channel means that these receptors should reasonably be expected to be exposed to ship noise.

Residual Impacts and Mitigation

A range of construction impact mitigation measures are proposed; a key measure common to all situations is consultation with residents and businesses potentially affected prior to and during the construction process. Other specific 'best practice' measures are detailed in the Construction Management Plan and Dredge Management Plan such as enclosure of pumps, activity timing, pump locations and the like; it is noted that specific control measures are to be specified once contractors are chosen and consideration of noise impacts can be factored into detailed construction planning. Additional noise modelling, particularly of booster emissions may be necessary to inform booster locations and plant specifications.

Ports North will assess impacts of port practices and update management plans and procedures as necessary.

ES.B.11 Air

Existing Situation

Baseline air quality was not monitored for either the Draft or this Revised Draft EIS, however monitoring data from similar locations have been used to simulate the existing background. The existing project area air environments are described as:

- The wharf and port area is influenced by air emission sources such as service stations, beverage processing, dry cleaning, port facilities, metal fabrication, surface coating and concrete batching.
- The Barron Delta DMPA and pipeline are in rural areas surrounded mainly by sugar cane farming. Cane firing is no longer widely practised in the area, so air pollution issues generated by existing activities would include dust from vehicle traffic, cane field preparation and harvesting, and wind erosion, with occasional smoke from cane firing during harvesting season.
- The Tingira Street DMPA air shed is influenced by industry such as asphalt plants and ship repair facilities, boating emissions and odours associated with inter tidal environments.

Impact Assessment Findings

Assessment of air quality impact assessments and mitigation strategies were based on preliminary locations of project elements and assumed plant and machinery specifications and emissions; these assessments however will inform development of detailed construction plans and plant and machinery selection as part of the contractor procurement.

The State TOR for this revised EIS require modelling of worst case air quality scenarios resulting in highly conservative outputs, including guideline exceedance of particulates (PM_{10} , $PM_{2.5}$) and NO_x) at sensitive receptors on Wharf Street. In addition until contractors are appointed and plant and equipment is confirmed, air quality modelling has used conservative assumptions on the duration of operations and emissions; as such assessments of impacts are over stated. A range of design and operational mitigation measures are proposed which will result in low to negligible residual construction and operation phase risks.

The international Maritime Organisation (IMO), as the international regulatory authority for international shipping, has made the decision to reduce the current global fuel sulfur cap from 3.5% to 0.5% commencing on 1 Jan 2020. Ships can meet the requirement by using low-sulphur compliant fuel oil. An increasing number of ships are also using Liquid Natural Gas (LNG) as a fuel as when ignited it leads to negligible sulphur oxide emissions. Ships may also meet the emission requirements by using methods such as exhaust gas cleaning systems or “scrubbers”, which “clean” the emissions (SO_x and ‘soot’) before they are released into the atmosphere. It is expected that major cruise ship companies will meet the 2020 regulations with scrubber technology giving the ships greater flexibility when in regions or areas with variable supply of low sulphur fuels.

With significant renewal of the cruise fleet between 2008 and 2020 there are a large number of cruise ships that already meet the low sulphur requirements, having installed scrubbers during construction or having been retro fitted on ships planned on being retained past 2020; this will enable compliance with current air quality guidelines, particularly as scrubber efficiencies continue to be improved.

Key findings of the air quality impact assessment include:

- The use of high efficiency exhaust scrubbers and or marine diesel by cruise ships when berthed will result in guideline compliance and a low residual air quality risk.
- Emissions from shipping should not cause exceedances of the air quality criteria if ships at berth use marine diesel or 0.1% low sulfur fuel or a high efficiency scrubber to achieve equivalent. Worst case modelling predicts that there is a potential for the cruise ships to cause exceedances of the PM_{2.5} and NO₂ criteria for the project scenario. The PM_{2.5} exceedance only occurred on one day in the modelled year, when there was moderate south-easterly wind with neutral stability class and relatively high mixing height throughout the 24-hour day. NO₂ exceedances are predicted for ten hours in the modelled year from within 6pm to 7am, when winds were light and blowing from the south and southeast and mostly having low mixing (inversion) heights at approximately 50 meters.
- If monitoring indicates potential exceedances may occur, requiring the use of marine diesel, 0.1% IFO, 0.1% sulfur fuel or more efficient scrubbers equivalent to 0.1%, would achieve compliance.
- Dust deposition levels from shipping are predicted to be within under the nuisance criterion but deposition of diesel soot may accumulate over time and be observable due its dark colour. This will be reduced by the uptake of high efficiency scrubbers or use of low sulfur fuel in cruise ships.
- If the backhoe dredge and associated tugs use marine diesel when near the wharf, PM₁₀ and PM_{2.5} concentrations should meet the criteria.
- The use of SCR (selective catalytic reduction) emission controls on diesel cranes during construction should lead to compliance with the criteria.

The use of diesel fueled backhoe dredge and associated barge will avoid potential criterion exceedance when operating near the wharf area.

- Emissions from the Northern Sands DMPA and pipeline pumps, which will operate approximately 40 hrs/week, will meet guideline levels if standard SCR emission control equipment is fitted. It may also be necessary to fit a minimum 4m exhaust stack to the tailwater pump to enable compliance with the NO_x guideline.
- Odour from anaerobic sediments from dredging is rarely more than a temporary problem. When first discharged it is initially anaerobic and may smell, but the smell is lost within a few days of its exposure to air.
- Emission control equipment are required to be fitted to construction machinery at the wharf landside works, Northern Sands DMPA and pipeline construction sites to ensure compliance with air quality guidelines.

In summary, there is low risk associated with the project provided the recommended mitigation measures are implemented.

Residual Impacts and Mitigation

Residual air quality risks associated with pipeline and Barron Delta and Tingira Street DMPA construction and operation are considered to be low with adoption of the proposed specific and 'best practice' mitigation measures. Risks associated with pipeline construction and operation are also assessed as low with implementation of mitigation measures.

Residual air quality risks associated with moored and manoeuvring cruise ships are predicted to be low given cruise ships will be in compliance with the new IMO fuel and emissions regulations by the project commencement date.

ES.B.12 Landscape and Visual

Existing Situation

The various areas to be affected by the CSD Project cover a range of landscape types described in Cairns Regional Council planning as: the *Barron Delta* (Northern Sands DMPA and delivery pipeline corridor), the *Cairns Coastline* (delivery pipeline corridor and to a lesser extent the Tingira Street DMPA), and the *Cairns Urban, Industrial and Port* (Landside Works area and Tingira Street DMPA). Some identified vantage points will have views to these areas. Although not included in Council's planning, the Great Barrier Reef World Heritage Area (GBRWHA) contains the channel, the pump out point, and the submerged part of the delivery pipeline from the pump out point to the mouth of Richters Creek.

These landscape types generally contain a range of existing infrastructure and disturbance. The exception is the beach at the southern end of Yorkeys Knob where the delivery pipeline will come ashore. This area is largely undisturbed and retains considerable scenic values. However, the mouth of Richters Creek is occasionally used by Council as a source of sand for beach replenishment and at such times contains a dredge and a dune-side track on the Holloways Beach side for heavy trucks.

The coastline is part of the GBRWHA which is listed partly for its scenic values. However, the attributes and features that comprise these values are present in study area to only a limited extent, if at all.

Impact Assessment Findings

Construction

During construction, the dredging operation will be noticeable from a number of vantage points, as will the movement of the dredger to and from the offshore pump out point. However, dredging is a regular occurrence in the Cairns area and the CSD Project involves a dredging campaign little different from regular maintenance dredging in terms of vessels, duration, and volume of material to be removed. Lights from night works at the Tingira Street DMPA will be visible from high rise apartments in the CBD and from vessels in Trinity Inlet but such lighting is not inconsistent with port uses.

The bunds at the Northern Sands DMPA will be largely unnoticeable from most vantage points and will be indistinguishable from stockpiles associated with the existing sandmining operation. The offshore pump out structure will be visible, although it will be some 2.8 km away and is not expected to be particularly intrusive. The most significant impact is expected to be the visual intrusion of the delivery pipeline where it makes landfall at the mouth of Richters Creek. This will be a short term impact (of the order of six months) and there will be no remaining works after demobilisation and rehabilitation. The balance of the delivery pipeline and its boosters will not be inconsistent with adjacent agricultural use.

Operation

During operation, changes expected to the current situation are that there will be larger ships (up from 52 m in height to 63 m height) and a greater number of ships overall. The number of large cruise ships visiting Cairns is likely to increase by an average of 5 -10% additional trips per year to 2026.

The likelihood that any observer will see a large cruise ship in the channel, berthed at the Port wharves or anchored at Yorkeys Knob on any given day or night, will increase slightly, but this increase is unlikely to be noticeable to most observers. This will not change the perceived character of Trinity Bay and the Port of Cairns, and is consistent with the character of Cairns as a tourist city, an access point for the Great Barrier Reef, and a gateway to the tropical north.

Residual Risk and Mitigation

Based on the assessments, all construction impacts to Landscape and Visual values can be reduced to Negligible, with the exception of the visual intrusion of the delivery pipeline at the mouth of Richters Creek. This is considered to be an amenity issue where mitigation via a community engagement program is recommended.

All operation phase risks able to be reduced to Negligible through the application of controls and commitments included in the various management plans contained in Part C of the Revised Draft EIS.

ES.B.13 Cultural Heritage

Existing Situation

Indigenous

Aboriginal parties with interests in the project area who were consulted for this project include:

- Yirrganydji Gurabana Aboriginal Corporation (YAC)
- Mandingalbay Yidinji (MY)
- Gimuy Walubara Yidinji (GWY)
- North Queensland Land Council (NQLC)

Consultation took place by phone calls, email and meetings. Discussions about the project and its implications on cultural heritage and aspirations in relation to lands took place during site inspections

The Cairns region is rich in Indigenous cultural heritage, of both contemporary and archaeological significance. Aboriginal sites in the study area reflect the strong connection between Aboriginal people and the cultural and physical landscape, and a strong focus on marine resources.

Indigenous sites recorded in unpublished reports for developments in the project area identify middens, scar trees and stone tools, however no places were recorded in the immediate vicinity of the Barron Delta DMPA and pipeline and Tingira Street DMPA footprints.

The Northern Sands DMPA site is extensively disturbed by agriculture and sand quarrying and not likely to contain any material of Aboriginal heritage. Yirrganydji oral history records a camp on the southern banks of the intersection of the Barron River and Thomatis Creek outside the footprint of the DMPA.

The shipping channel contains places of significance to multiple Aboriginal parties. The waterway is associated with travels of the ancestors including Gudju Gudju (rainbow serpent), Damarri and Guyulu and the Cassowary Story.

The channel and wharveside works area occurs within the Cairns Tidal Wetlands which is listed on the Australian Places Heritage Inventory (APHI) for its significant heritage values, including unusual and diverse combinations of landform and habitat zones for several rare and endangered birds, nursery habitat for fish, prawn and crab and examples of sand ridges once common in the Cairns area. The APHI notes the area also contains significant Indigenous values, presumably associated with the marine resources, story places and potential for archaeological remains.

Non Indigenous

Following clearing by early pioneers in the mid-1800s, the Barron Delta DMPA has been used for agriculture; in more recent times the area has almost exclusively been used for sugar cane production and since the 1990s a sand quarry has operated on the site. No items of non-Indigenous cultural heritage have been recorded on site.

A review of historic aerial photographs of the Cairns area between 1949 and 1990 showed that the Tingira Street DMPA remained undisturbed mangrove vegetation until shortly before 1983, when it began to be cleared and reclaimed for port development.

A search of relevant registers and databases identified no non-Indigenous heritage sites listed on Queensland Heritage Register, CairnsPlan2016, Australian National Shipwreck Inventory, Qld WWII Historic Places or National Heritage List that relate to the Tingira Street site.

The Cairns Shipping channel contains significant non-Indigenous heritage including evidence of European exploration, shipwrecks and World War II remnants such as the 1878 Bessie Point Hydrographic Survey Benchmark and Submarine Boom Net foundations, however these sites are all outside the footprint of the proposed shipping channel.

The wharf area was the site of the first landing of Europeans on what was to become the city of Cairns. The wharf area was reclaimed in the 1940s. Reclamation involved filling in the mouths of Lily and Alligator Creeks, which once housed a fishing settlement known as Malay Town. There is a possibility some remnants of Malay Town exist under the southern end of the existing wharves.

Impact Assessment Findings

Key Indigenous and Non Indigenous cultural heritage impact assessment findings include:

Indigenous

- No significant cultural heritage places were identified on the Tingira Street site during consultation with the Aboriginal parties. No concerns were raised about the impacts from dredge spoil location on the Tingira Street site, considering the extent of previous disturbance.
- All Aboriginal parties raised concerns about the ongoing impact to marine and terrestrial resources from the proposed dredging and land placement
- YAC and MY advised these story places will not be impacted by the proposed work (J. Singleton, D. Mundraby pers comm).
- GYW raised specific concerns about potential impacts to the Cassowary Story associated with Admiralty Island and Trinity Inlet and expressed the desire to control a long term environmental and cultural monitoring program of story places in the Inlet.
- Thomatis Creek contains extensive marine resources, including mangroves, mud mussel, fish, stingray that were and continue to be exploited by Aboriginal people. The area also has land based bush tucker including fruit trees. Three middens are recorded on the AQUIS site north of Thomatis Creek, one was investigated with George Skeene. A possible scar tree has been recorded on the southern bank of Thomatis Creek.
- Yirrganydji oral history identifies a pre and post contact camp on the banks of Thomatis Creek, to the north of the existing quarry (J. Singleton pers comm). Northern Sands currently maintains a buffer of 80m from the creek line as part of its environmental conditions and this is considered adequate to protect the cultural values of the Yirrganydji camp.
- Sand ridges have a high potential for Indigenous sites. The northern pipeline route crosses a sand ridge, and will need to be surveyed in detail prior to removal of any vegetation, in accordance with a CHMP.

Non Indigenous

- The Cairns Shipping channel contains significant non-Indigenous heritage including evidence of European exploration, shipwrecks and World War II remnants. These sites are all outside the footprint of the proposed shipping channel.
- None of the early European landing sites or camps were located on the Tingira Street site.
- Trinity Wharves were constructed between 1910 and 1942 and are listed on the Queensland Heritage Register for aesthetic, scientific, historic and social values.
- The removal of sections of deck to allow the installation of independent mooring dolphins, whilst clearly not ideal in heritage terms, may be the least worst option available for the future conservation of Wharves 1 - 5.
- The current proposal includes the demolition of Wharf 6. Wharf 6 contains different historical values and construction techniques to those of Wharves 1-5 but is in very poor structural condition due to the severe deterioration of the timber piles, headstocks, timber girders and concrete deck.
- Malay Town was a notorious multiracial camp on the banks of Lily Creek that grew from the late 1890's until Cairns Harbour Board demolished it from 1941 onwards as part of the Alligator Creek land reclamation. It is possible that services trenching works associated with wharf upgrading works may disturb this area.

Residual Risk and Mitigation

Risk to Indigenous and Non-Indigenous Cultural Heritage is considered to be low to negligible with implementation of the following measures:

Indigenous

It is recommended that the following measures are taken to ensure any potential ICH impacts are minimised or mitigated:

- Cultural Heritage Management Plans (CHMP's) will need to be developed with YAC and should include precautionary measures such as survey of the proposed pipeline at Northern Sands.
- The existing 80 metre buffer from waterways, as per existing quarry conditions, should be retained to ensure an adequate buffer around the Yirrganydji camp. This should be confirmed during further site inspections with Yirrganydji representatives during development of the CHMP.
- Develop a CHMP with GWY regarding management of impacts to story places within and adjacent to the Shipping Channel.
- Facilitate face to face meetings with the Aboriginal parties regarding potential environmental impacts.
- Address Native Title implications prior to commencement of any works.
- Aboriginal parties should be kept informed during design, construction and operational phases of the project about the potential impacts and results of monitoring the environmental health of the mangroves, rivers, creeks and harbour from the proposed project.

Non Indigenous

- With respect to wharf 6 demolition, select an approach that would retain fabric, expose the relevant characteristics relating to the heritage significance of the wharf (the timber substructure) and facilitate interpretation of the wharf's heritage values by providing a conserved 'heritage element'.
- Monitoring of wharf upgrade services installation works in the area south of wharf 6 (Old Malay Town material) by a qualified archaeologist.

ES.B.14 Transport

Assessment Scope

A traffic impact assessment was undertaken for the Draft EIS (2014); this was reviewed and updated on the basis of revised demand projections and included an assessment of the following project elements on the local and regional traffic networks:

- Wharf redevelopment construction
- Passenger transportation
 - Bus and taxi
 - Pedestrian links
- Ship supply delivery
- Dredging establishment and operation
- Dredge material pipeline establishment, operation and demobilisation
- Barron Delta (Northern Sands) DMPA establishment and operation
- Tingira Street DMPA establishment, operation and demobilisation

Impact Assessment Findings

- Construction works associated with the wharf redevelopment for the Cairns Cruise Liner Terminal will have negligible impacts on the external transport network.
- The operations of the Cairns Cruise Liner Terminal will have negligible impacts on the external transport network.
- The sea based dredging operations will be established from sea and involves the transfer of crews on a 2 weekly shift change by coach. There will be negligible impacts on the external transport network by the sea based dredging operations.
- The delivery and assembly of the pipeline transferring dredged soft clays to the Barron Delta (Northern Sands) will have negligible impact on capacity of the network.
- The operation of the pipeline transferring dredged soft clays to the Barron Delta (Northern Sands) is to be serviced by 18 to 20 staff per day and a daily fuel truck and service vehicle. The impact on the operation of the road network is negligible.
- The establishment and operation of the Northern Sands DMPA requires approximately 6 staff per day for a total period of 24 weeks. The impact on the operation of the road network is negligible.
- The establishment and operation of the Tingira Street DMPA sites requires the movement of up to 3 light vehicles and 3 heavy vehicles per day over the 22 week establishment, operations and disestablishment phases. The impact on the operation of the road network is negligible.

Residual Impacts and Mitigation

Whilst the establishment and assembly of the pipeline transferring dredged soft clays to the Barron Delta (Northern Sands) will have negligible impact on capacity of the network, the pipe haulage contractor will need to confirm the haulage vehicle configurations, routes, timing and manoeuvrability through intersections through the TMR permitting process. In addition, consideration will need to be given to the construction of temporary access works on Holloways Beach Road and Yorkeys Knob Road and the provision of traffic controllers to facilitate safe access and egress of the heavy vehicles.

Some refinement of internal facilities and management associated with pedestrian and bus/taxi provisions at the Cairns Cruise Liner Terminal are recommended to improve safety and functionality at the terminal.

All traffic and transported risks have negligible risk once mitigations have been implemented.

ES.B.15 Waste

Existing Situation

Cairns Regional Council (CRC) is responsible for the management of most solid waste generated in the study area through the operation of a kerb-side household and commercial collection program and network of public waste transfer stations. In addition, Cairns and surrounding areas are also generally well serviced by a broad range of commercial waste companies that operate both under contract to CRC, and directly to commercial and industrial clients. A range of solid and liquid waste management infrastructure is available within the study area, with many of these currently used by Ports North, or its waste contractors supporting the operation of the CCLT. Current services include quarantine waste removal.

Impact Assessment Findings

Construction

Waste generation during pre-construction and construction phases will be minimal with the exception of solid waste associated with the demolition of Wharf 6. It is expected that about half of the waste generated from wharf demolition will be able to be recycled. Works primarily related to the construction of the two DMPAs will generate wastes typical of a small construction site.

Operation

Waste from ships docked at the port is currently the largest source of waste handled at that location. Ships require offloading of a variety of wastes while at port, including general waste, quarantine waste, liquid and hazardous wastes, and sewage and greywater. The CSD Project will allow for an increased volume of cruise ship visits at the CCLT, with a corresponding increase in liquid and solid waste volumes being generated from these vessels. However, there is sufficient capacity and capability within the Cairns waste management sector to effectively manage these wastes.

There is adequate treatment capacity and works are proposed to increase the effective capacity of sewage and greywater infrastructure to convey these wastes to the CRC sewerage system through the use of buffer tanks.

During the operational phase, landside waste generated by patrons and staff at the CCLT will be minimal, and will continue to be collected by licensed waste contractors. It is anticipated that while the existing system and configuration of larger volume (front-lift) waste bins for general wastes and recyclables will remain, the frequency of collection of these front-lift bins will need to increase.

Residual Risk and Mitigation

Based on the assessments, all impacts associated with Waste are or can be reduced to a Low or Negligible residual risk through the application of controls and commitments included in the various management plans contained in Part C of the Revised Draft EIS.

ES.B.16 Climate Change and Greenhouse

Existing Situation

Climate Change

The Intergovernmental Panel on Climate Change (IPCC) has reported that climate changes are linked to increased emissions of Greenhouse Gases (GHGs) caused by human activity. Predictions for the Cairns area are that the most noticeable non-ecological effects of climate change are expected to be:

- sea level rise
- increase in storm tide inundation levels and extent
- change in tropical cyclone intensity and frequency.

Ecological effects are discussed elsewhere and in any case will not affect the CSD Project itself.

Greenhouse Gases

GHGs are not an impact – rather the emission of these is thought by the IPCC to be a causal factor in climate change. Emissions arise from a number of activities including vegetation clearing (negligible for the CSD Project) and the consumption of materials and energy.

Impact Assessment Findings

Construction

Climate change is not expected to have a significant impact on the proposed DMPAs as these facilities will not be operational as DMPAs beyond the construction phase (i.e. before the effects of climate change are noticeable).

GHG emissions will be generated during the construction phase, primarily from the use of dredge vessels and booster pumps, as well as heavy and light construction vehicles. Vegetation clearing is minimal (approximately 17 ha, some of which will be rehabilitated). The overall level of emissions during this phase is low (even without mitigation) and mitigation is feasible. Industry trends towards GHG emission reductions can be expected to a positive influence.

Operation

The landside works, in common with other parts of the port and CBD, will be affected by any increase in the intensity of frequency of tropical cyclones. The impact to infrastructure (including the inner and outer channels) from cyclones can be mitigated by adaptation measures, including redesign. Inundation of wharf structures caused by sea level rise is not expected based on current climate change projections and does not require action other than monitoring of projections. If sea level rise projections increase to a level where inundation could occur, reconstruction of structures to appropriate levels and standards will be required.

While GHG emissions from the project are not anticipated to be significant (and largely occur due to increased shipping which would occur with or without the CSD Project), some measures are available to Ports North to minimise contribution to emissions above a 'no project' scenario. These include refinement and optimisation of both capital and maintenance dredging activities as well as associated construction activities, introduction of energy-efficient technologies at the CCLT, and awareness training for port users regarding energy efficiency.

Residual Risk and Mitigation

Based on the assessments, most risks relevant to Climate Change and Greenhouse can be reduced to a Low or Negligible residual risk through the application of controls and commitments included in the various management plans contained in Part C of the Revised Draft EIS. The one exception is the construction phase GHG emissions that have an assessed risk of Medium.

ES.B.17 Hazard and Risk

Existing Situation

The Cairns area is exposed to a number of natural hazards such as cyclonic winds, storm tides, Barron River flooding, bushfires, and other rarer hazards such as earthquakes and tsunamis. In addition, there are various health and safety hazards such as pandemics, biting insects, marine stingers and crocodiles. For all of these there are established management and response systems or design standards in place and these are adequate for CSD Project elements that are exposed to such hazards.

Impact Assessment Findings

Construction

The likelihood of a natural hazard occurring during the construction period is quite low, especially as many of these are associated with cyclones that generally occur outside the planned construction period. Other local hazards such as those affecting health and safety are not able to be planned for and, due to the short construction program, exposure is brief.

The only project-specific elements and activities that have required detailed assessment and will require targeted management are associated with the placement of the soft clays at the Northern Sands DMPA. Bunds are required to increase the volume of the existing void to contain the placed material and its associated water. In order to create the required containment volume, these bunds will be well above Cairns Regional Council's design flood level. This means that the DMPA will have a very high immunity to flooding. However, the bunds will interfere with floodwaters (should flooding occur during the brief period for which they are in place) and this would increase flood levels in some surrounding areas (and reduce them in others). However, the magnitude of this extra flood level is very small (of the order of 20 to 40 mm in adjacent properties) and this is considered to be a minor impact.

Similarly, while there is a remote possibility that an out of season flood could overtop the bunds as they are lowered as the placed material settles, the placed material will become more and more resistant to remobilisation as it densifies and develops a crust. The detailed assessment shows that the unmitigated risk of remobilisation of placed material due to flooding is negligible. Mitigation is not required and is not feasible.

During the construction process there will be a number of workplace-related risks that would apply to any similar project in the Cairns area and that are routinely dealt with by Ports North and its likely contractors. A project-specific risk is failure of the delivery pipeline (accidental or as a result of vandalism / sabotage) and a management response is warranted. Again, the period of exposure is brief and management can be targeted.

Operation

During the operation phase the Landside Works Project Area will be exposed to natural hazards as described above, as well as a number of normal risks for which there are well-established plans and procedures in place. Management of these types of risks is 'business as usual' at the port.

Residual Risk and Mitigation

Based on the assessments all construction hazards and impacts identified have a Low to Medium residual risk rating whilst the operational hazards and risks that are identified as being High are existing risks and not additional risks introduced by the delivery of the CSD Project. Those existing High risk activities are well established and actively managed by Ports North as part of existing management and operational practices, protocols and plans. Project-specific activities associated with the soft clay placement (increased flood levels and remobilisation of placed material due to flooding) have Negligible risk.

Natural hazards are all the subject of established management and response systems or design standards and these are adequate for CSD Project elements that are exposed to such hazards.

ES.B.18 Cumulative Impacts Assessment

Existing Situation

Recent work undertaken by the Great Barrier Reef Marine Park Authority (GBRMPA) in its strategic assessment of the Great Barrier Reef (GBR) has identified all existing threats to the health of the GBR. This provides a framework for investigating the impacts of the CSD Project as it includes consideration of the severity of the threat and the scale over which it occurs. For example, impacts at a local scale that occur in the study area as well as elsewhere are not generally cumulative as they occur independently and do not interact. Conversely, any reef-wide threats arising from the CSD Project would be of concern as they would add to impacts that occur from other project and activities. Relevant cumulative impacts that are of concern to GBRMPA are:

- dredging
- exotic species and diseases
- marine debris
- modifying supporting terrestrial habitats
- physical damage — ship grounding
- sediments from catchment run-off
- vessel strike on wildlife.

In addition, the CSD Project could lead to other activities that could have additional (consequential) impacts:

- increased cruise shipping
- increased maintenance dredging
- increased visitation
- increased demand on infrastructure and services.

Impact Assessment Findings

Construction

The main construction activity is dredging. This has been found by GBRMPA to be a local impact for all port projects and this is confirmed by the current assessment (Low risk at the local scale dropping to Negligible risk at the reef-wide scale). All cumulative impacts are assessed to have Negligible to Low risk when considered along with other planned or current projects and activities.

Operation

During the operation stage a small (2-6%) increase in maintenance dredging (and marine placement) is predicted as a consequence of the CSD Project. This is assessed as being of Negligible to Low risk. All other consequential impacts will be Negligible, generally due to the fact that the threats are already well-managed by relevant agencies. End-uses of the two DMPAs are either neutral (Northern Sands DMPA) or beneficial (Tingira Street DMPA).

Residual Risk and Mitigation

Based on the assessments, all cumulative and consequential risks can be reduced to a Low or Negligible residual risk through the application of controls and commitments included in the various management plans contained in Part C of the Revised Draft EIS.

In the case of consequential impacts, there are a range of management plans in place by external agencies. For example, coastal shipping is the subject of management by the Australian Maritime Safety Authority via its North-East Shipping Management Plan and the additional number of cruise ship transits through the GBR is well within the existing management capabilities of Marine Safety Queensland's Vessel Traffic Safety systems (including ReefVTS). Management of visitation to the GBRMP and Wet Tropics World Heritage Area is managed by GBRMPA and the Wet Tropics Management Authority / Queensland Parks and Wildlife Service respectively.

ES.B.19 EPBC Act Issues

Existing Situation

The CSD Project requires approval under the EPBC Act. This act protects what are called Matters of National Environmental Significance (MNES) and those relevant to the CSD Project are:

- protected areas (the GBR World Heritage Area, the GBR National Heritage Place, and the GBR Marine Park)
- listed threatened plants, animals, and plant communities, plus migratory animals.

A specific Revised Draft EIS chapter on the EPBC Act issues has been prepared to aid in the assessment under that act and for this reason, many of the matters discussed are also addressed in other chapters dealing with Nature Conservation Areas, Marine Water Quality, Terrestrial Ecology (species and communities), Marine Ecology (species), and Landscape and Visual (landscape values).

The key additional matters to consider for world heritage areas are the concepts of *Outstanding Universal Value* (these are the attributes and features that underpinned their listing) and *integrity* (i.e. the processes that sustain these values). This work benefited from the strategic assessment of the GBR described for the cumulative impacts assessment as it established the relationship between criteria that underpinned world heritage listing and the features and processes upon which these depend. It was possible to use this framework to identify which of these features and processes are present locally and then assess relevant impacts on these, while recognising that a holistic view is required.

Impact Assessment Findings

Construction

The threatening processes relevant to MNES included all of those listed for cumulative impacts as these apply to GBR (the marine park and the world heritage area). For example, construction impacts such as dredging (found to involve Low risk at the local scale and Negligible to Low risk at the regional and reef-wide scales respectively) occur through minor changes to sea bed communities and reduced water quality during dredging and discharging tailwater from the Northern Sands DMPA. Impacts on species were also assessed and this involved consideration of vessel strike on marine megafauna amongst other matters.

Additional impacts are relevant to terrestrial values (listed threatened species and migratory species) and these include the loss of some individuals of the Ant plant through construction of the soft clay delivery pipeline and possible temporary disturbance of migratory birds. See Terrestrial Ecology.

Operation

Operation of the CSD Project involves the consequential impacts discussed previously and these were found to involve Negligible risk.

Residual Risk and Mitigation

Based on the assessments, all impacts to MNES can be reduced to a Low or Negligible residual risk through the application of controls and commitments included in the various management plans contained in Part C of the Revised Draft EIS.

The issue of resilience (of the GBR) was also addressed and while documented in the chapter on cumulative impacts, is equally relevant to EPBC Act issues. This addressed seagrass meadows (especially the effect of turbidity from maintenance dredging and resuspension at the Offshore DMPA) and marine megafauna (vessel strike and depleted seagrass meadows). Both were found to have Negligible to Low risk of residual impacts.

ES.C.1 Construction Environmental Management Plan

This document draws from the mitigation and monitoring recommendations provided within each of the preceding technical chapters of the EIS. The broad purpose of this CEMP is to achieve the following:

- Provide practical and achievable strategies and plans for complying with environmental requirements
- Demonstrate compliance with relevant legislative obligations
- Outline performance criteria to be met by the Project
- Provide evidence to stakeholders and the community that construction and operation of the project will be managed in an environmentally and socially sensitive manner
- Specify roles and responsibilities, monitoring regimes and corrective actions.

The scope of this CEMP includes construction and decommissioning of the Northern Sands and Tingira Street DMPAs, wharf and services upgrades. Environmental management of construction of the dredge material delivery and tailwater pipelines is addressed in C2: Dredge Management Plan.

The CEMP provides a framework which will inform detailed project design, planning. It will also inform contractor procurement and once appointed, preparation of contractor management plans containing detailed management measures, once accurate construction specifications are known. Only potential impacts rated as low or higher after mitigation are addressed.

Key environmental management strategies addressed in the CEMP include:

- Potential Acid Sulfate Soil
- Fauna Management (including Crocodiles)
- Stormwater and Erosion and Sediment Control
- Landscape and Visual Amenity
- Indigenous and Non-Indigenous Cultural Heritage
- Noise impacts (including impact to marine fauna)
- Air Quality impacts
- Environmental monitoring

ES.C.2 Dredge Management Plan

The overall purposes of the environmental strategies within the DMP are to:

- Identify potential and actual environmental aspects and impacts associated with the works
- Describe the appropriate measures to prevent, monitor and manage all possible effects
- Indicate the corrective action(s) to be undertaken if an undesirable impact or unforeseen level of impact occurs
- Outline monitoring, auditing and reporting actions.

The scope of the DMP includes construction and operation of the dredge material delivery and tailwater pipelines and dredging operations.

The DMP provides a framework which will inform detailed project design, planning. It will also inform contractor procurement and once appointed, preparation of contractor management plans containing detailed management measures, once accurate construction specifications are known. Only potential impacts rated as low or higher after mitigation are addressed.

Key environmental management strategies addressed in the DMP include:

- Water Quality and Marine Ecology
- Marine Megafauna
- Marine Sediment Quality
- Pipeline Terrestrial and Marine Ecology
- Pipeline ESCP
- Vessel Washdown
- Marine Pest Incursion
- Vessel Waste Management
- Noise and Air
- Landscape and Lighting
- Emergency Planning

ES.C.3 Vessel Transport Management Plan

The construction phases of the project will generate marine traffic that has the potential to impact on vessel and marine safety and influence navigation. The VTMP is necessary to meet the requirements of applicable legislations, achieve best practice management of vessel traffic in relation to the project construction and to aid in achieving the requirements of both Ports North and the relevant authorities.

This plan describes the measures to be implemented during the construction of the project for monitoring and controlling vessel operations to achieve the following objectives:

- Provide practical and achievable plans for the management of construction vessel operations such that vessel safety is maintained and obstruction of navigation of other traffic is eliminated/minimised
- Provide Ports North and regulatory authorities such as MSQ with a framework to confirm compliance with requirements
- Provide a framework for the development of contractor specific VTMP(C) to be developed by the appointed contractors
- Provide the community with evidence and assurance that the management of construction vessels will be conducted in a manner that supports safe navigation for recreation vessels at all times.

The VTMP will also be included as part of Ports North's tender documentation for selecting the preferred dredging and marine construction contractors following approval of the EIS and completion of the EIS process.

It has been prepared to assess and manage impacts from the construction phase of the project (e.g. mobilisation, construction and demobilisation) and addresses potential marine traffic and safety issues identified in relation to vessel operations and maritime works during the construction phase of the project.

The key maritime construction aspects of the project (including mobilisation, construction and demobilisation) that are relevant to this plan include:

- Capital dredging by the Trailer Suction Hopper Dredge (TSHD) and Backhoe dredger (BHD) vessels
- The installation, operation and removal of a pump out mooring and pipeline for hydraulic placement of the dredge material at the Barron Delta DMPA (for material dredged by the TSHD)
- Placement of dredge material at the Tingira Street DMPA (for material dredged by the BHD)
- Navigation Aids and Wharf Upgrade Works
- The operation of support vessels including survey and work boats

A separate Marine Operations Management Plan (Chapter C4) has been prepared to assess and manage impacts from the operational phase of the project (e.g. post construction).

Management of vessel traffic once the project construction commences will be controlled under Standard for Marine Construction Activities within Cairns Harbour by a Harbour Master's Direction under Section 86 of the *Transport Operations (Marine Safety) Act 1994*. This document will supersede and include the operations covered in the VTMP.

ES.C.4 Maritime Operations Management Plan

This Marine Operations Management Plan (MOMP) has been prepared to assess and manage impacts from the operational phase of the project (e.g. post construction). The purpose of this MOMP is to inform any changes that need to be made to Ports North's current operational plans as a result of the project.

In the context of increased shipping activities and movements that will accrue from the CSD project, it should be recognised that management controls and actions for shipping and maritime activities in Port of Cairns are already in place. This document presents as an overview which makes reference to the existing management plans and in response to the EIS Terms of Reference (TOR).

The purpose of this MOMP is to identify the preferred means of addressing issues associated with changes in maritime operational activities (operational shipping) as a result of the project and reduce the potential for negative impacts on the environment, vessel safety and operational efficiency.

Key elements of the plan include:

- Management Structure
- Vessel Traffic Management
 - Navigation Areas
 - Management Systems
 - Operations Resources
 - Emergency Management
 - Vessel Strike
- Navigation Aids Management

- Ship Sourced Pollution Prevention Management
 - Release of Ballast Water and introduction of Exotic Marine Organisms
 - Release of Shipping Waste
 - Spills and Ship Sourced Pollution
- Action Program
 - Continuous Improvement
 - Auditing
 - Monitoring
 - Records
 - Implementation Responsibilities