Port of Gladstone
Gatcombe and Golding Cutting Channel Duplication Project

Environmental Impact Statement

Gladstone Ports Corporation
Growth. Prosperity. Community.

aurecon

Appendix Q2 Project Environmental Management Plan

Plan

Gatcombe and Golding Cutting Channel Duplication Project Environmental Management Plan

Endorsed:

Brief description

This Project Environmental Management Plan has been developed to document Gladstone Ports Corporation's systems and controls for minimising the risk of environmental impacts associated with the Gatcombe and Golding Cutting Channel Duplication Project (the Project) in the Port of Gladstone. Specifically, this plan applies to the establishment of the Western Basin Expansion reclamation area, installation of the navigational aids and maintenance of the reclamation area.

This Project EMP forms part of the Environmental Impact Statement (EIS) prepared for the Gatcombe and Golding Cutting Channel Duplication Project

Document information

Current version	2
First released	31 May 2018
Last updated	26 February 2019
Effective by	To be confirmed
Review frequency	Refer Section 6.10
Review before	To be confirmed
Audience	Government and community as part of the public display of the Project EIS

Document accountability

Role	Position
Owner	Port Strategy and Development General Manager
Custodian	Environment Manager

Table of Contents

Terms and definitions

The following key terms and definitions apply to this Plan:

Term	Definition
AASS	actual acid sulfate soil
ASS	acid sulfate soil
ASSMP	Acid Sulfate Soil Management Plan
BUF	Barge unloading facility
CEnvO	Contractor's Environment Officer
Coastal Act	*Coastal Protection and Management Act 1995*
CPESC	Certified Professional in Erosion and Sediment Control
CSD	cutter suction dredger
Cth	Commonwealth
DAF	Department of Agriculture and Fisheries
DAWR	Department of Agriculture and Water Resources
DES	Department of Environment and Science
DoEE	Department of Environment and Energy
EHP	Former Department of Environment and Heritage Protection
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EP Act	*Environmental Protection Act 1994 (Qld)*
EPP (Air)	*Environmental Protection (Air) Policy 2008*
EP Reg	*Environmental Protection Regulation 2008* (Qld)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
ERA	Environmentally Relevant Activity
ESCP	Erosion and Sediment Control Plan

Term	Definition
ESMM	Environmental Specialist Monitoring and Measurement
GPC	Gladstone Ports Corporation Limited
ILUA	Indigenous Land Use Agreement
IMO	International Maritime Organisation
LAT	lowest astronomical tide
LNG	liquefied natural gas
MCU	material change of use
MSQ	Maritime Safety Queensland
NAGD	*National Assessment Guidelines for Dredging 2009*
NC Act	*Nature Conservation Act 1992 (Qld)*
NEPM 2013	National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amendment 1, 2013)
NGER Act	*National Greenhouse and Energy Reporting Act 2007* (Cth)
PASS	potential acid sulfate soils
PCCC	Port Curtis Coral Coast
Project	Port of Gladstone Gatcombe and Golding Cutting Channel Duplication Project
QCLNG	Queensland Curtis Liquefied Natural Gas
QGC	Queensland Gas Corporation
QH Act	*Queensland Heritage Act 1992*
QPWS	Queensland Parks and Wildlife Counter Service Offices
SDPWO Act	*State Development and Public Works Organisation Act 1971*
TSHD	trailing suction hopper dredger
WB	Western Basin

Term	Definition
WBE	Western Basin Expansion
WHA	World Heritage Area
WMP	Waste Management Plan
g/m²	grams per meter squared
km	kilometres
m	metres
m LAT	meters lowest astronomical tide
mm	millimetres
m/s	meters per second
m^3	cubic metre
m^3/s	cubic meters per second
mg/L	milligrams per Litre
Mm^3	million cubic metres

1. Background

The Port of Gladstone is located approximately 525 kilometres (km) north of Brisbane and 100km south of Rockhampton on the Capricorn Coast of Central Queensland. The Port is managed by the Gladstone Ports Corporation Limited (GPC) which is a Government Owned Corporation under the *Government Owned Corporations Act 1993* (Qld).

GPC is currently working to improve operational and economical efficiencies within the Port of Gladstone as throughput and associated vessel numbers, including Capesize vessels, increase. The Port of Gladstone Gatcombe and Golding Cutting Channel Duplication Project (the Project) involves the duplication of the existing Gatcombe and Golding Cutting bypass shipping channels to provide deeper duplicated channels parallel to the main shipping channels with a sufficient depth to allow an improved two-way passage into the Port under all weather and tidal conditions.

The Coordinator-General declared the Project to be a coordinated project for which an Environmental Impact Statement (EIS) is required under the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act).

The Commonwealth Environment Minister declared the Project to be a controlled action for which an EIS is required under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

This Project Environmental Management Plan (Project EMP) forms part of the Project EIS. Specifically, this plan applies to the establishment of the Western Basin Expansion reclamation area, installation of the navigational aids and maintenance of the reclamation area.

The environmental management of activity components of the Project, associated with dredging activities have been included in the Dredging EMP.

2. Scope

The scope of this Project EMP covers the construction and maintenance phases of the Project and includes the following activities:

- Establishment of site compound, office and temporary areas for the Western Basin Expansion (WBE) reclamation area
- Source and transport of material for construction of the WBE reclamation area bund walls and barge unloading facility (BUF)
- Construction of the WBE reclamation area bund walls and BUF prior to dredging commencing
- Removal of existing and installation of new navigational aids in the Port of Gladstone
- Surface stabilisation works and maintenance works within the existing Western Basin (WB) and WBE reclamation area.

This Project EMP must be read in conjunction with, and also refers to elements of the following associated documents:

- The Project Environmental Monitoring Procedure (refer Appendix A)
- The GPC Environmental Management System (EMS) (refer Section 6)
- Construction contractors' EMP (to be developed prior to construction works and maintenance activities commencing).

The Project EMP specifies performance objectives, actions and procedures to minimise and mitigate potential environmental impacts of the non-dredging related activity components of the Project and address the Commonwealth and Queensland Government's EIS approval requirements.

This Project EMP complements the findings of the EIS as it consolidates the relevant Project activity-specific environmental management and mitigation measures to be implemented during the Project.

3. Environmental legislation

This Project EMP has been developed to support the Project EIS and respond to the terms of reference issued by the Coordinator-General and the EIS Guidelines issued by the Commonwealth Government.

The following Commonwealth legislation is relevant to the Project construction and operational activities:

- EPBC Act
- *Great Barrier Reef Marine Park Act 1975* and regulations
- *National Greenhouse and Energy Reporting Act 2007* (NGER Act)
- *Native Title Act 1993.*

The following State legislation is relevant to the construction and maintenance activities associated with the Project:

- *Aboriginal Cultural Heritage Act 2003*
- *Biosecurity Act 2014*
- *Coastal Protection and Management Act 1995*
- *Environmental Offsets Act 2014*
- *Environmental Protection Act 1994* (EP Act), environmental protection policies and regulation
- *Fisheries Act 1994* and regulation
- *Land Act 1994*
- *Maritime Safety Queensland Act 2002* and *Queensland Coastal Contingency Action Plan 2017*
- *Nature Conservation Act 1992* (NC Act) and regulations
- *Planning Act 2016* and regulation
- *Queensland Heritage Act 1992*
- SDPWO Act
- *Sustainable Ports Development Act 2015*
- *Transport Infrastructure Act 1994*
- *Transport Operations (Marine Safety) Act 1994*
- *Transport Operations (Marine Pollution) Act 1995*
- *Vegetation Management Act 1999* (VM Act).

This Project EMP will be revised post EIS approval to incorporate the relevant EPBC Act controlled action conditions and the Coordinator-General Report conditions.

Table 3.1 Statutory approvals and documents for Project dredging and dredged material placement

Approval/permit	Permitted activities
ERA 16	
Tidal works	
Allocation of quarry material	
EPBC Act controlled action	
Marine plant removal	

4. Objectives

This Project EMP forms part of GPC's EMS and is intended to be a working management document to be implemented during Project construction and maintenance activities to ensure legislative compliance and best practice environmental management. This Project EMP also provides a structured program for the management of the works to ensure that all reasonable and practicable measures will be implemented within an adaptive management framework, to prevent and/or minimise the likelihood of environmental harm being caused during the works.

The objectives of this Project EMP are to:

- Define and understand the sensitivities of the significant and sensitive environmental values/receptors in the Port
- Provide a summary of environmental aspects (refer Appendices B and C) and potential impacts (refer Appendix E)
- Implement control measures that minimise the potential for environmental harm
- Establish contingency plans and emergency procedures
- Record organisational structures, accountability and responsibility
- Facilitate arrangements for effective communication
- Monitor parameters at environmental receptors to allow an adaptive management response that reduces environmental impacts
- Facilitate an adaptive approach through review of management measures and environmental monitoring outlined in this Project EMP and implementing appropriate changes to achieve desired environmental outcomes
- Ensure all staff and contractors are trained and aware of legislative requirements pertaining to the works as well as commitments made in this Project EMP
- Ensure appropriate records are kept
- Ensure that reviews of environmental performance and continual improvement are undertaken periodically.

5. Implementation

Prior to the commencement of the Project works, this Project EMP will be revised and submitted to the Department of Environment and Energy (DoEE) and the Department of Environment and Science (DES) for review and approval. Project works should not be undertaken in a way which:

- Contravenes this Project EMP (which will incorporate the relevant Project EIS commitments and environmental approval conditions which allow the Project to proceed)
- Is inconsistent with GPC's EMS.

Where there is conflict between this Project EMP and documents compiled by an engaged contractor, conditions imposed in this plan will prevail. All relevant staff and contractors will be introduced to and made familiar with the provisions of this Project EMP and with the procedures and processes which will achieve the objectives relevant to this plan.

Following the commencement of works, amendments to this Project EMP and associated documents must be communicated to and approved by the GPC Environment Manager and Port Infrastructure and Asset Manager. Any changes to this plan must also be communicated to and approved by the DoEE and DES prior to the changes being implemented.

5.1 Management responsibilities under the Project EMP

Throughout the construction works and operation of the WB and WBE reclamation areas, the overall management of the Project will be under the supervision of the GPC with day to day control of the Project under the appointed contractor/s. The GPC Environment Manager will be the main point of contact in relation to the implementation of this Project EMP.

6. Environmental Management System

Activities carried out by GPC for the Project activities covered under this EMP will conform to GPC's AS/NZS ISO14001 certified EMS. This EMP and its associated documents form part of GPC's EMS.

The EMS Plan #146256 is the overarching directory of the EMS for all sites within GPC, and allows any person easy access to any/all documents contained within it. The EMS Plan is a concise overview of the framework used to manage environmental risk. The aim of the plan is to be a user friendly tool in the form of a directory to quickly guide the user to the desired area of the EMS.

The EMS is an evolving system and is constantly being evaluated and improved when required. Figure 6.1 is a schematic detailing the inputs, outputs and tools utilised in the EMS.

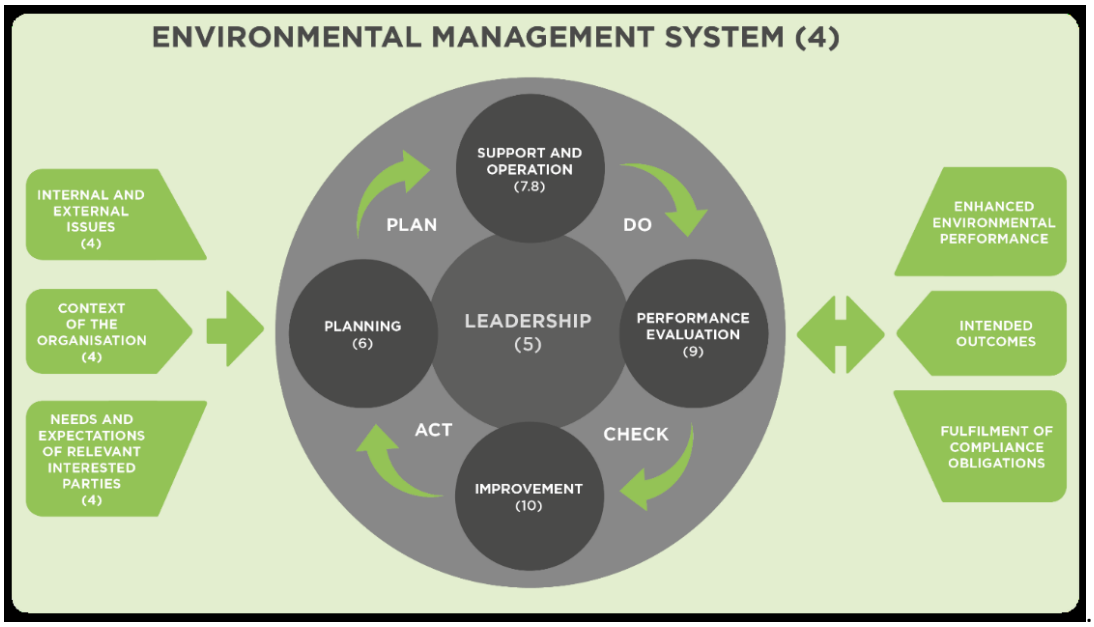


Figure 6.1 EMS schematic

The provision of services by the contractor will be underpinned by the implementation and continual improvement of a management system consistent with the elements of:

- AS/NZS ISO 9001 Quality Management Systems
- AS/NZS ISO 14001 Environmental Management Systems
- AS/NZS 4801 Occupational Health and Safety Management Systems.

6.1 Environmental Policy

The GPC Environmental Policy #366016 defines the overall aims and direction of GPC towards the environmental management of its activities and commitments to continual improvement. It also describes the direction and responsibilities of GPC in relation to its environmental performance.

6.2 EMS legislation

Environmental management of port operations has numerous and varied legislative controls which govern the way GPC conducts its business. To be aware and understand all of GPC's compliance obligations, GPC has developed the two registers below.

1. Legal Register #1007885 describes firstly, what the legislation is and means, and secondly, how it affects GPC activities. The register is regularly updated to ensure that it captures relevant legislative changes and incorporates new development approvals, permits and registrations applicable to GPC operations.

2. Conditions Register #1292854 identifies GPC's existing approvals, each condition and how GPC meets the condition requirements.

Section 3 details the environmental legislation relevant to this Project.

6.3 Environmental risks

GPC's Risk Management Framework provides the processes to ensure the EMS suitably identifies, analyses and evaluates, manages and monitors all aspects under the control or influence of GPC. The risk management process is an integral component of GPC's organisational and operational decision making and ensures all elements of potential impacts are assessed (i.e. environmental, compliance, interested parties (stakeholders), project delivery, etc).

Risk assessments are conducted for all new or changed activities prior to each dredging campaign ensuring risk controls are current, appropriate, communicated, implemented and monitored.

Environmental risks for dredging and dredged material placement are assessed and recorded on the GPC Risk Register #764185 in accordance with the GPC Risk Management Policy and Risk Management Standard #829152. The implementation and effectiveness of risk controls are monitored through processes such as periodical risk reviews, audits, inspections, incident and complaint investigations, and reporting.

6.4 GPC Environmental Strategy

The GPC Environmental Strategy #801782 establishes GPC's overall approach and priorities for environmental management. The Strategy has been developed taking into account GPC's Environmental Policy, its environmental impacts and relevant legal and other requirements. The Strategy provides an overview of the environmental issues relevant to GPC's operations and documents GPC's environmental initiatives proposed to be undertaken to enable environmental objectives and targets to be achieved.

6.5 GPC Environmental Standards

GPC has implemented the following standards to provide clarity of obligations, responsibilities and expectations for environmental management:

- GPC Environmental Management Standard #809151
- GPC Safety, Environment and Security Standard for Contractors and Port Users #995910.

All activities must be conducted in accordance with these standards.

6.6 Environmental roles and responsibilities

GPC staff and contractors are responsible for the environmental performance of their activities and compliance with the approvals relevant to the Project.

GPC staff and contractors are also responsible for complying with the general environmental duty as set out in Section 319 (1) of the EP Act which states:

> *'A person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to minimise the harm.'*

Table 6-1 provides a summary of the responsibilities and accountabilities associated with the implementation of this Dredging EMP, including GPC staff and the dredging contractors.

Table 6-1 Environmental roles and responsibilities

Position	Responsibility	Reporting to
GPC		
Port Infrastructure Planning Manager	Dredging contract. Implementation of this Dredging EMP and responsible for reporting to the relevant authorities.	Port Strategy and Development General Manager
Civil/Structural Engineer	GPC contact for operational issues and management of contractor.	Cargo Handling Operations General Manager
Port Strategy and Development General Manager	Overall responsibility for Environmental Policy, strategy and EMS framework.	Chief Executive Officer
Environment Manager	Ensure environmental management, reporting and auditing responsibilities are met.	Port Strategy and Development General Manager
Environmental Specialist - Compliance	Responsible for monitoring the of Dredging EMP implementation and compliance with approval conditions.	Environment Manager
Environment Advisor Monitoring and Measurement	Responsible for the coordination of GPC environmental monitoring programs.	Environment Manager
Environment Emergency Hotline	General and afterhours contact for the GPC environmental team.	Environment Manager
Dredging contractor		
Vessel Master	Responsible for all aspects of vessel shipboard management. Including the complying with applicable management actions within this Dredging EMP.	Manager Dredging Operations

Position	Responsibility	Reporting to
Contractor's Environmental Officer (CEnvO)	• Understand the contents of and the reason for implementing the elements of the Dredging EMP • Ensures adequate training in the elements of the Dredging EMP is provided to all personnel • Ensure that personnel involved in the Project, including subcontractors, suppliers and visitors, have received the relevant environmental training required to ensure they are aware and understand their responsibilities under the Dredging EMP and environmental approvals • Reporting all environmental incidents to GPC and lead incident investigations related to any incidents that may occur • Regularly inspect and monitor all activities for conformance to the Dredging EMP and compliance with all Project approval conditions • Assist and advise subcontractors and staff of environmental requirements and potential detrimental environmental impacts as required • Implementation and monitoring of the Dredging EMP.	Vessel Master/Manager Dredging Operations
Marine Operations Manager	Management of overall operations of dredger.	Senior Manager Dredging

6.7 Contractor management

GPC will engage a contractor to undertake dredging and dredged material placement on its behalf. GPC has obligations to ensure that the activities undertaken by, or on its behalf, do not present unacceptable risks to the environment. To ensure the activities of contractors are identified, assessed and managed the following contactor management controls are in place:

- Identify and assess all environmental aspects and impacts related to the tasks undertaken by the Principal contractor, subcontractors and suppliers
- Ensure environmental outcomes and requirements are delivered through the implementation and monitoring of this Project EMP
- Ensure all supervisory, management staff, employees, subcontractors and suppliers receive the relevant environmental instruction in relation to the Project EMP and be made aware of and understand their obligations and duties
- Ensure that appropriate and adequate resources are allocated to allow for the effective implementation and maintenance of this Project EMP
- Preparation of a detailed EMP that must address the requirements set out in this Project EMP, the EPBC Act controlled action conditions, the Coordinator-General's Report and any additional Project approval conditions
- Implementation and monitoring of the Project EMP
- Ensure periodic reviews of environmental performance

- Report all environmental incidents that occur to GPC and ensure that all regulatory timeframes for reporting are able to be met.

6.8 Environmental monitoring

GPC conducts a range of environmental monitoring programs to monitor operational activities that can have an actual or impacts on the environment. It informs adaptive management, compliance and performance review, risk assessment and continual improvement processes for managing project activities as detailed by this EMP.

GPC will implement environmental monitoring outlined in this EMP and the Procedure (refer Appendix A) for activities associated with the Project in order to achieve the following outcomes:

- Compliance with the Project environmental approval conditions
- Ensure an adaptive management framework by adjusting operations in response to environmental monitoring results.

The Procedure includes the following aspects:

- Significant and sensitive receptors in the port area are identified and mapped
- All licenced discharges are monitored
- Ensure any unplanned releases will have adequate monitoring to assess potential impacts
- The methods for collection and analysis of samples (including specific areas to be monitored, when monitoring is undertaken and duration of monitoring)
- The methods of analysing the data and responding to the results to ensure compliance with the conditions
- Reporting intervals
- Review of environmental performance is undertaken periodically to ensure an adaptive management framework is achieved.

To achieve the above, compliance is required with the Procedure as well as this Dredging EMP.

6.9 Measures, plant and monitoring equipment

GPC will install, maintain and operate all relevant measures, plants and monitoring equipment in a way which ensures compliance with the conditions of this Dredging EMP and relevant Project approvals. There will be no change, replacement, alteration or operation of any plant or equipment if the change, replacement, alteration or operation will increase or is likely to substantially increase the risk of environmental harm during works.

It is the contractor's responsibility to ensure that they install, maintain and operate all relevant measures, plant and equipment utilised in their scope of works in order to ensure compliance with the conditions of this Dredging EMP, associated plans and relevant approvals.

6.10 Environmental training

GPC will ensure that employees and contractors working at GPC facilities have received the appropriate level of environmental training and that all relevant records are retained in accordance with the GPC Learning and Development Standard #934182.

GPC employees have training and awareness delivered in a variety of ways which begins with inductions, and mandatory training and then progresses to an individual learning and development plan.

Environmental awareness is achieved not only through training, but by also using a variety of medias, such as:

- Internal and external publications
- Weekly environmental performance report
- Environmental toolboxes
- Digital communication screens
- Consultation with stakeholders through review processes.

It is the contractor's responsibility to ensure that all personnel, including subcontractors, are suitably trained for all activities for which training is required in order to ensure legislative compliance and prevent environmental harm during normal operation and in emergencies or under the close supervision of a suitably trained person.

6.11 Environmental audits and inspections

Internal auditing may be undertaken to confirm that activities are carried out in accordance with the defined requirements set out in this EMP and relevant approvals. Audits are initiated and completed by the GPC Environment team or by a suitably qualified auditor nominated by the GPC Environment team. Audit reports may be provided to GPC regulators as and when required.

If requested by GPC, GPC staff will be afforded access to witness, inspect, examine or audit any part of the contractor's operations. If requested by a regulatory agency, nominees of the relevant agency will be afforded access to witness, inspect, examine or audit any part of the operations.

GPC will carry out periodical inspections. Records of these inspections along with any corrective or improvement actions arising from inspections or audits will be entered into GPC's incident management system Cintellate.

6.12 Independent environmental auditing

Within the first two weeks of commencing activities an independent environmental audit of compliance with Project approval conditions and requirements of this EMP and the Procedure will be undertaken. GPC will obtain DoEE and DES approval for the nominated independent auditor and the audit criteria, if required.

6.13 Complaints

There are several ways that GPC can become aware of environmental complaints, this includes notification from terminal customers, employees, contractors, community members and regulators.

The Environmental Complaints Management Procedure #1044716 details how to notify, identify and escalate, respond to and review complaints ensuring effective complaints handling. Complaints received will be entered into Cintellate. The records in Cintellate will include all relevant details of the incident and/or complainant, details of any immediate corrective actions, investigations and/or monitoring undertaken, conclusions formed and improvement actions identified to reduce the risk of reoccurrences.

GPC's Environment Manager and Port Infrastructure Planning Manager must be notified by GPC staff and/or the engaged contractor on receipt of a complaint regarding perceived or real environmental nuisance or harm as a result of an activity specific to the works covered by the scope of this EMP and any other associated works immediately.

The following details must be collated for all complaints received. GPC will provide this information to DoEE and/or DES on request:

- Time, date, name and contact details of the complainant
- Reasons for the complaint
- Any investigations undertaken
- Conclusions formed
- Any actions taken.

6.14 Non compliances and incidents

GPC's Environment Manager and Port Infrastructure Planning Manager must be notified as soon as practical after GPC and/or engaged contractor has become aware of any non-compliance specific to activities covered by the scope of this EMP and any other associated works.

This notification is to take place in accordance with the following methods and timeframes:

- Verbal notification immediately after occurrence of incident to GPC's Environment Manager
- Written notification within 24 hours of occurrence of incident to GPC's Environment Manager.

GPC must notify DES and/or DoEE of any incident resulting from activities undertaken as part of the works which:

- Causes or has the potential to cause environmental harm, or
- Is unlawful, or
- Involves the release of a contaminant, or
- Marine megafauna injury or death, or
- Identifies a new environmental risk, or
- Is not in accordance with the relevant approvals and/or permits.

GPC (or the contractor) must telephone DES's Pollution Hotline (1300 130 372) immediately after becoming aware of any incident involving injury, fatality or other harm to any species of turtle or marine mammal during dredging activities.

For other incident types GPC (or the contractor) must report to DES's Pollution Hotline (1300 130 372) and/or DoEE (02) 6274 1694 as soon as practicable, but no later than 24 hours after becoming aware of a reportable event, in accordance with the conditions of the appropriate approval.

If GPC and/or engaged contractor becomes aware of material environmental harm or serious environmental harm as defined under the EP Act as a result of carrying out the activities covered by the scope of this EMP or other associated works, then the said activity(s) must be ceased immediately.

If at any time during the course of dredging or dredged material placement activities, an environmental incident occurs or an environmental risk is identified, all reasonable measures must be taken by GPC to mitigate the risk or impact.

Incidents are recorded in the Cintellate system and holds all relevant details of the incident, including immediate corrective actions, investigations and/or monitoring undertaken, conclusions formed and improvement actions identified to reduce the risk of reoccurrences.

Written advice will be provided by GPC (or the contractor) to the relevant administering authorities in accordance with the conditions of the appropriate approval. The following details may be required:

- Name of the registered operator, including development approval number
- The name and telephone number of a designated contact person
- The location of the release/event
- The time of the release/event
- The time you became aware of the release/event
- The suspected cause of the release/event
- The sensitive receptor(s) that may have been impacted
- A description of the resulting effects of the release/event
- The results of any sampling performed in relation to the release/event
- Actions taken to mitigate any environmental harm and or environmental nuisance caused by the release/event
- Proposed actions to prevent a recurrence of the release/event.

GPC's Incident Management and Investigation Procedure #1075526 is used to guide incident reporting, external notifications, investigations and corrective actions, including record keeping requirements. The contractor's incident reporting procedure will be included in the Contractor's EMP and must include the requirements outlined in this EMP.

GPC also records and communicates the number and type of incidents internally through weekly, monthly and annual reports.

6.15 Emergency preparedness

GPC has documented policies, standards and procedures which provide a framework for ensuring GPC develops and maintains capacity to efficiently prepare for, respond to, and recover from, an emergency, major business disruption and/or crisis event.

The following documents outline GPC requirements for emergency preparedness and will be reviewed by, and requirements adhered to, by the relevant contractor prior to commencement of Project activities:

- Risk Management Policy #924357
- Business Resilience Standard #852778
- Crisis Management Procedure #872678.

GPC is responsible for first-strike response to oil spills, within the boundaries of the port, in accordance with the MSQ First-strike Oil Response Plan attached in Appendix D of this Project EMP.

6.15.1. Contingency planning

Although management measures cover most potential impacts, contingency arrangements are required in the event of emergency or abnormal operations. These may include but are not limited to:

- Operations in adverse weather conditions (e.g. cyclones)
- Marine incident.

In the event of any abnormal operating circumstances, the contractor will contact the GPC Environment Manager and Port Infrastructure Asset Manager to formulate and advise the contractor of GPC's preferred course of action to minimise environmental harm.

6.16 Records

All records required by this Project EMP, associated documents and the relevant approvals must be kept for at least 5 years. Records will be kept in either of the following secure repositories:

- GPC's Risk Management System – Cintellate
- GPC's Document Management System – EDocs.

This will include as a minimum:

- Monitoring, incident and complaints records
- Correspondence with the administering authority as per environmental approval requirements.

All records required by the relevant approvals must be kept for at least 5 years. Records will be kept in either of the following secure repositories:

- GPC's Compliance Management System – Cintellate
- GPC's Document Management System – EDocs.

All records required by this plan and associated permits must be provided by the contractor to GPC upon request and/or at the completion of the Project activities.

6.17 Communication

The Port Infrastructure Asset Manager is the main point of contact with the contractor, and is supported by the Civil/Structural Engineer and the GPC environmental team to achieve compliance with the Project EMP, associated documents and permits.

GPC is the main point of contact for external parties in regards to Project activities in the Port of Gladstone. The contractor, as the operator, will initiate emergency response calls, incident and complaint notification to GPC, investigation and reporting for works under their contract scope and the scope of their EMP. The contractor will initiate emergency response calls for any matters outside of their scope of works in the event that the GPC main point of contact is unavailable.

6.18 Review

This Project EMP, its operation and implementation and its associated documents, will be reviewed following the findings of internal and external audits and/or in the event that a performance indicator is not met.

Revisions are to be kept as a new version in GPC's document management system and if commitments are added or changed, must be communicated to and approved when necessary by all relevant GPC staff, engaged contractors and administering authorities. Changes of a minor nature will not require resubmission to administering authorities.

7. Activity description

7.1 Overview

The key activity components of the Project EMP are summarised below.

- Establishment of site compound, office and temporary areas for the WBE reclamation area
- Transport of material for construction of the WBE reclamation area, bund walls and BUF
- Construction of the WBE reclamation area bund walls and BUF, prior to dredging commencing
- Provision of services to the Project activities
- Removal, relocation and installation of new navigation aids in the Port
- Surface stabilisation works and maintenance works within the WB and WBE reclamation areas.

The WBE reclamation area is shown in Figure 7.1.

7.2 Construction of WBE reclamation area construction compound and office

Construction equipment required for the reclamation bund walls includes trucks (either GPC contractors with body truck with trailer, or other road going vehicles). A small number of excavators and/or dozers will also be required to assist in the placement of material.

A construction compound will be located on the established Fisherman's Landing and/or WB reclamation area. A small site office for 20 construction staff will be utilised during the reclamation bund wall construction and up to 196 people (over two shifts) during the dredging operation. A carpark for office and workshop staff will also be established with the construction compound area. The final location and layout of these facilities will be determined prior to the reclamation area construction commencing, and will take into account adjoining land use activities and access requirements.

7.3 WBE reclamation area bund wall

The construction of the reclamation bund walls will commence three years prior to the Channel Duplication dredging commencement. A connection structure (e.g. bridge or series of culverts) will be constructed between the WBE reclamation area (southern area) and the WBE reclamation area (northern area).

While the Project impact assessment assumes a three year construction period for the establishment of the WBE reclamation area and BUF, a shorter period may be adopted subject to the Project dredging commencement date. The construction period for the WBE reclamation area and BUF will be confirmed during the detailed design phase.

As part of the reclamation area concept design and based on experience with similar dredged material in the Port an average bulking factor of 1.25 has been adopted. The bulking factor is the ratio of dredged volume after placement within the reclamation area, to the in situ volume of sediment to be dredged. In relation to the Project, the in situ dredged volume is 12.85Mm^3, while the volume of the dredged material within the WB and WBE reclamation areas will be 16.06Mm^3.

Gladstone Ports Corporation
Growth, Prosperity, Community.

aurecon

Legend

- Western Basin Expansion reclamation area
- Initial dredging works for barge access channel
- Barge unloading facility
- Weir box (proposed)
- Construction compound
- Existing shipping channels

Bund wall cross section types

B1 Armour and core material with geotextile (refer Figure 7.2)

B2 Core material with geotextile (refer Figure 7.3)

B1
B1
B1
B1
B2
B1
B1
B1

Dredged Material Dewatering Ponds

Licenced Discharge Point (for Western Basin Expansion reclamation area)

Licenced Discharge Points (for existing Western Basin reclamation area)

Curtis Island

Existing Western Basin Reclamation Area

Dredged Material Dewatering Ponds

Northern Pond

Southern Pond

Fisherman's Landing

Source:
Aerial: GPC (2015) and DigitalGlobe Web Map Service (2013)

Map by: RB P:\GIS\Projects\237374_GPC_Channel_Duplication_EIS\237374_EIS_363.mxd 12/02/2019 10:18

0 255 510 Metres

Date: 12/02/2019 Version: 0 Job No: 237374

Coordinate system: GDA_1994_MGA_Zone_56

Gatcombe and Golding Cutting Channel Duplication Project

Figure 7.1: Western Basin Expansion reclamation area

Table 7.1 provides the Project dredged material volume proposed to be included in the WBE reclamation area.

Table 7.1 Dredged material volume to be managed within the Western Basin and Western Basin Expansion reclamation areas

Project dredging component	Dredged material volumes (Mm^3)		Dredged material volume managed within the WBE reclamation area	
	In situ	Within WB and WBE reclamation areas including bulking factor	Southern area	Northern area
Initial dredging works	0.25	0.31	21.90	
Stage 1 dredging	7.25	9.06	2.30	6.76
Stage 2 dredging	5.35	6.69	2.80[1]	3.89
Total	**14.12**	**17.655**	**7.00**	**10.65**

Table notes:

1 Including 2.00Mm^3 of Project dredged material within the southern area assumes that there is a four year or greater duration between Stage 1 dredging finishing and Stage 2 dredging commencing

2 It is likely that only the initial dredging works material and approximately 0.20Mm^3 of Stages 1 and 2 dredged material will be accommodated within the existing WB reclamation. It is important to note that the volume of Stages 1 and 2 dredged material could be lower or higher than the 0.20Mm^3 included in Table 2.16. The volume of Project dredged material to be included within the existing WB reclamation area will be confirmed during the detailed design phase of the Project.

The existing WB reclamation area and the southern and northern placement areas of the WBE reclamation areas (refer Figure 7.1) will be required to accommodate the Project Stage 1 dredged material due to factors summarised below:

- The limited capacity within the existing WB reclamation area
- The Stage 1 volume of the material to be dredged, bulking factor of the dredged material and the need for managing the dewatering process within both the southern and northern reclamation areas to achieve the quality of tailwater discharge
- The limited size and capacity within the WBE reclamation area (southern area) (11.2ha). As the dredged material is being transported by trucks and not being pumped, as the area starts to fill up, there will be limited space for movement of trucks and equipment given the fact that the dredged material was a high clay content.

The above reasoning is based on the assumption that by the time the Project dredging commences, it is possible that the existing WB reclamation area is unavailable due to the prospect of new industries planning to establish in Gladstone and their dredging requirements being incorporated in the existing WB reclamation area. This could result in most of the excess material (about 6Mm^3) from the southern pond moved into the northern pond with no further capacity available in the existing WB reclamation area unless a mound is created or moved to a different location. However, except for a small quantity (a couple of million cubic meters of the peripheral bunds +16m LAT high) constructing a mound with the rest of unconsolidated mix of dredged material and water is not possible for several years.

Based on Project concept design for the WBE reclamation are and the volume required to manage the initial dredging works and the Stage 1 dredged material volume (i.e. 9.06Mm^3 over a 33 week period), implementing the proposed dredging methodology (refer to Section 2.4.4.2), both the southern and northern WBE reclamation areas are required to be constructed prior to the Stage 1 dredging commencing.

The layout of the bund wall for the WBE reclamation area is shown in Figure 7.1. Typical cross sections of the bund wall are provided in Figure 7.2 and Figure 7.3.

The bund wall concept design has allowed for storm tide and sea level change of 1.88m above the existing HAT level at Fisherman's' Landing as part of establishing a preliminary bund height of +7m LAT.

A detailed analysis of storm tide and climate change allowances will be undertaken during detailed design of the bund wall. The existing Fisherman's Landing reclamation area adjacent to the WB reclamation area was constructed to a bund wall level of +6m LAT and the Western Basin reclamation area was constructed to a bund wall level of +7m LAT This level has been adopted for the WBE reclamation area bund wall for preliminary design and EIS purposes.

The Project dredged material placement within the WBE reclamation area has been assumed to reach up to a maximum height of +8m LAT within the enclosed bund walls to cater for surface drainage gradient.

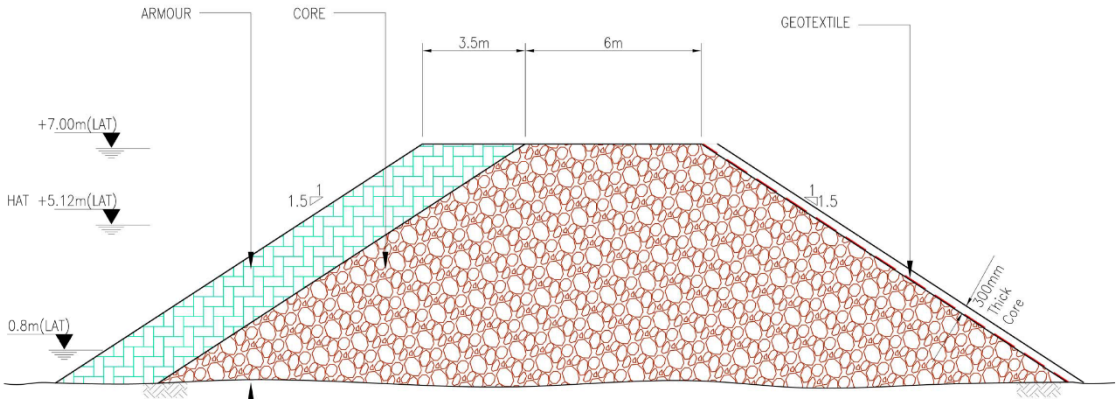


Figure 7.2 Western Basin Expansion typical section of peripheral bund wall – armour, core and geotextile (bund wall type B1)

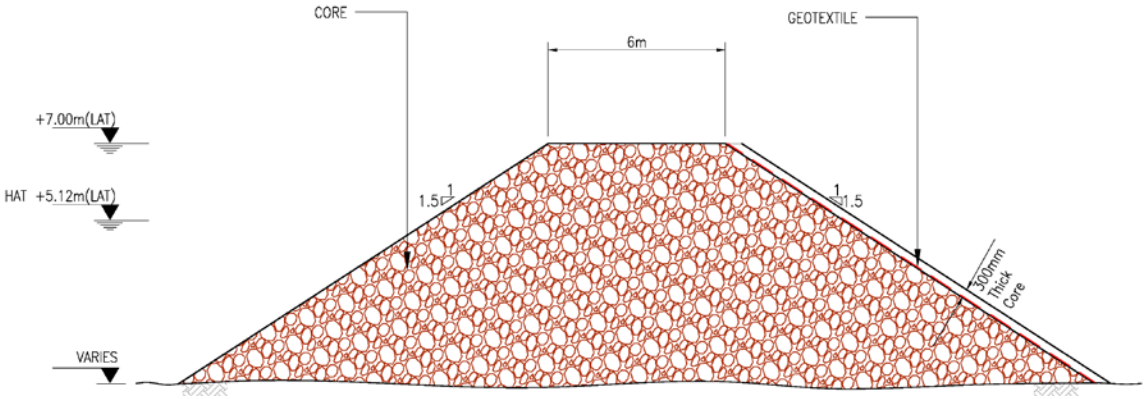


Figure 7.3 Western Basin Expansion typical section of bund wall – core and geotextile (bund wall type B2)

Approximate bund wall material volumes are summarised in Table 7.2. The final material volumes for the reclamation area will be determined during the detailed design phase of the Project.

Table 7.2 Western Basin Expansion bund wall material volumes

Rock type	Description	Weight range (kg)	Southern area approximate quantity (m^3)	Northern area approximate quantity (m^3)	Total approximate quantity (m^3)
Armour	Hard, durable rock, of a size suitable for use in the marine environment, as revetment/armouring to withstand environmental conditions	200 to 300	60,000	113,000	**173,000**
Core	Hard, durable rock also suitable for use in the marine environment, but typically of a smaller size to the armour, to be used to form the core of the bund wall	10 to 100	387,568	567,730	**955,298**
Total rock volumes			**447,568**	**680,730**	**1,128,298**

Table notes:
Rock density is 2.6t/m^3
Quantity volumes are based on a 1.3 allowance for sinkage and contingency
Core material will contain fines (approximately 5%) to assist in the sealing of the outer bund wall
Refer to Figure 7.2 and Figure 7.3 for the typical cross section location of rock types

During the placement of dredged material within the reclamation areas, a series of decant ponds will be constructed internal to the outer bund wall to allow for the fine material to settle from the tailwaters. The internal ponds will be designed to store the soil-water mix for a sufficient time, as to allow the suspended sediments to settle and limit the suspended fines in the discharge water to reduce to acceptable levels (i.e. less than or equal to 100mg/L).

The final decant pond configuration and design will be undertaken during the detailed design phase of the Project and finalised by the dredging contractor based on the dredging methodology. The final decant pond will also capture stormwater discharges from within the reclamation area and the final land use.

7.4 Construction of a barge unloading facility

The construction of the BUF will involve the installation of sheet piles or similar earth retaining structure to form a 'U shaped' barge dock adjacent to the existing WB reclamation area (refer Figure 7.4). The footprint within the enclosed sheet pile or similar earth retaining structure will be filled with material to allow excavators (i.e. six in total with three each side of the dock) and trucks (in the order of 32 trucks) to transport dredged material from the barges into the existing WB and WBE reclamation areas.

Two short rock bunds made up of core material and protected with armour sourced from the Targinnie/Yarwun quarry location will be installed between the sheet pile or similar earth retaining structure dock and the existing WB reclamation area bund wall. The footprint within the rock bunds and sheet pile walls or similar earth retaining structure will be filled with material (approximately 0.2Mm3 of existing dredged material from within the existing WB reclamation area) to allow excavators and trucks to travel between the BUF and the existing WB reclamation area.

The construction of the BUF will commence 12 months prior to dredging commencing.

The location and dimensions of the BUF are shown on Figure 7.5, and a typical cross section of the BUF is provided in Figure 7.4.

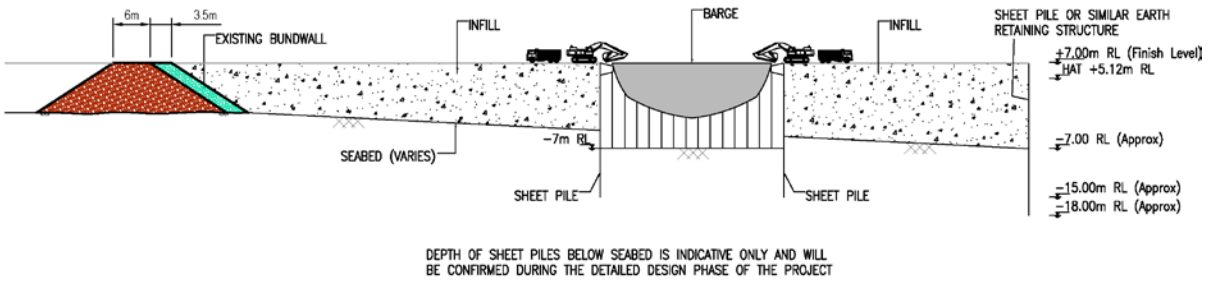


Figure 7.4 Barge unloading facility typical section

The eastern side of the barge dock wall within the BUF will form the wharf line for a future shipping berth for the WB port land when it is no longer required for unloading dredged material from Port dredging campaigns.

Gladstone Ports Corporation
Growth, Prosperity, Community.

aurecon

Source:
Aerial: GPC (2015) and DigitalGlobe Web Map Service (2013)

Map by: RB
P:\GIS\Projects\237374_GPC_Channel_Duplication_EIS\237374_EIS_240.mxd 12/02/2019 09:04

Metres
0 125 250

Date: 12/02/2019 Version: 2 Job No: 237374
Coordinate system: GDA_1994_MGA_Zone_56

Gatcombe and Golding Cutting Channel Duplication Project

Figure 7.5: Proposed area to be dredged for barge access channel and barge unloading facility

7.5 Source and transport of WBE reclamation area bund material

The rock material for the construction of the bund walls will be sourced from the existing local quarries within the Gladstone region. Rock material is likely to be transported to the reclamation area via the existing public road network depending on the location of the quarry site.

Environmental management and approvals for the extraction and transport activities associated with reclamation bund wall construction are the responsibility of the quarry operator(s) and the reclamation area construction contractor.

For the purposes of this Project EMP, the likely general quarry location is within the Targinnie/Yarwun area and rock material is likely to be transported to the WBE reclamation area via the public road network.

7.6 Bund construction sequence

Bund construction methodology for the WBE reclamation area will involve the following construction works:

- Placement of core material
- Placement of armour material
- Topping off
- Placement of geotextile including placement of 300mm core layer on top of the geotextile
- Drainage control structures/weir boxes to manage water flow
- Dredged material filling and decant management
- Final surface completion.

The construction methodology to be adopted for the bund wall construction tasks is provided below. The bund wall design and construction implementation has addressed the relevant findings and recommendations of the *Gladstone Bund Wall Independent Review*.

7.6.1. Placement of core materials via trucks along public roads

Core material for the reclamation bund walls will be delivered from the Targinnie/Yarwun quarry location and transported via public roads directly to the outer bund wall work faces.

Core material for the WBE reclamation area will be placed directly over the existing sediments by:

- End tip material onto the bund, with the material being pushed over the face by a bulldozer or end loader, and/or
- End tip directly over the end of the core material bund
- Bund material will then be shaped by bulldozer, grader or long arm excavator depending on location and required bund profile.

The specification and selection of the core material will include a range of material gradings as finer/smaller rock and earth material diameter sizes will assist in reducing the likelihood of piping through the reclamation bund walls during the dredged material dewatering process within the reclamation area.

The core material for the seaward and intertidal locations will sink through the soft silt bed to settle on the stiff clays underneath. In the process of settling through the soft bed, the silt material has the potential to:

- Become embodied in the matrix of the core material
- Push out a mud wave ahead of the bund, and/or

- Push out a mud wave to either side of the bund.

Potential environmental impacts from placing rock material on the seabed and intertidal areas will be minimised by implementing the mitigation measures detailed in the ASSMP and this Project EMP.

Based on the preliminary geotechnical investigations undertaken as part of the EIS process it is not anticipated that soft paleo channels will occur under the proposed reclamation area bund walls. An additional geotechnical investigation will be undertaken during the detailed design phase of the reclamation area, and if paleo channels are found to occur in the reclamation area, appropriate design and construction methodologies will be implemented to minimise the potential for piping under the bund walls and mud wave erosion on the outside of the wall. The three year reclamation bund walls establishment timeframe will assist in minimising potential piping impacts through the bund walls.

The initial placement of core material for the finished seaward bund wall will be to a level above the HAT. The finished crest level will be a minimum of +7m LAT and approximately 6m wide to allow construction vehicles to transport material above the marine water level. The crest will also comprise an additional 3.5m for the armour material.

Core material will also be used for the intertidal/landward and internal bund walls.

Surveyors will control and guide the progression of the bund wall to the required alignment and levels as it extends out into the water. As the bund wall extends off the coastline, there will be the need to provide turning areas and lay-bys to facilitate the efficient and safe movement of construction plant and equipment.

7.6.2. Placement of armour material via trucks along public roads

To protect the bund core material from wave and storm conditions, armour material will be placed along the seaward exposed face of the core material following behind the core work face. This normally involves at least partial installation of the protective armour as soon as practically possible.

Rock armour at the front of the bund will sink through the soft silt bed, creating a secure foundation for the armour above. Rock armour is tolerant of some movement and settlement. Monitoring of line and level during construction will identify any areas of settlement. Additional rock can then be easily added to maintain the required coverage.

A stockpile of armour material will be held at the quarry, sufficient to cover any exposed core material if a cyclone were to approach Gladstone. The reclamation construction contractor will prepare an emergency plan which will include procedures to address severe climatic events such as cyclones and minimise where practicable the potential environmental impacts from the reclamation works.

7.6.3. Topping off

After completion of the bund wall placement of core and armour material, the bund will be topped off with core material (run of pit) to bring the bund walls to final design levels (+7m LAT). Depending on the reclamation design, an appropriately secured and continuous inner geofabric filter material will be installed on the bunds inner face to reduce the passage of fines through the rock structure. Some additional rock protection will be required on the inner face of the bund on top of the geotextile to provide additional protection from wave action generated by standing water within the sediment ponds or placement of dredged material during operation.

7.6.4. Geotextile placement

Geotextile material will be placed against the inner face of all of the outer bund walls. The purpose of the geotextile material is to minimise the migration of dredged material fines through the bund wall to the marine waters of Port Curtis.

The geotextile material will be keyed into the rock armour material at its base and ultimately at the crest of the wall to prevent slippage and deformation from occurring prior to placement of the core material or over the life of the reclamation process. The geotextile material will be laid on the bund wall such that no wrinkles, gaps, folds or deformations occur in the material. All joints will be sewn to create seams and will conform to the requirements of AS3706 (Geotextiles – Methods of Test). Overlaps in the fabric will be directly vertically down slope of the armour material.

The geotextile material will be non-woven and generally comply with the specification or acceptable equivalent below.

- Weight > 542g/m^2
- Tensile strength > 1,690N
- Trapezoidal tear > 644N
- Puncture resistance > 1,070N
- Permittivity < 0.7sec-1
- Apparent opening size < 0.150mm.

The placement and restraint of the geotextile liner will be specified in the detailed design phase of the reclamation bund wall and will meet industry best practice, recognised industry standards and the relevant findings of the Gladstone Bund Wall Independent Review, including:

- Be placed on the inner bund wall material and then be overlaid and secured by core material (up to 300mm)
- Be laid on the bund wall such that no wrinkles, gaps, folds or deformations occur in the material, with all joints sewn to create seams and to conform to the requirements of AS3706: (Geotextiles – Methods of Test). Overlaps in the fabric will be directed vertically down the slope of the bund surface.
- The geotextile will be secured in place and protected with a 300mm thick layer of core material.

7.6.5. Proposed dredged material placement

Once the outer reclamation and internal bund walls are complete, and the geotextile material is restrained and stabilised, dredged material will be transported into the WB and WBE reclamation areas. Dredged material and water mix will be placed by trucks into the primary internal cells to be filled out in turn. A secondary cell and final polishing cell will be utilised to ensure settling of suspended particles and limit the suspended fines in the decant water to acceptable levels (i.e. less than or equal to 100mg/L).

Dredged material placement within the WB and WBE reclamation areas will be mounded to the final profile as much as possible from direct placement from the trucks.

The ratio of solids over transport water is a function of the available power on the dredger pumps, as well as the type of material, cut height, pipeline diameter and the delivery distance. It is estimated that the tailwater flows may vary from 5,000m^3 to 30,000m^3 per day. This tailwater flow rate is indicative only and will be finalised with the selected dredging contractor.

The internal dewatering cells will be designed to ensure the surface area and volume is large enough, and the detention time is sufficient to meet the required decant water quality licenced discharge limit (i.e. less than or equal to 100mg/L). Variable height weir boxes will be installed between the cells, allowing the rate of discharge and movement of waters between cells to be controlled. The cells will be designed and maintained so that a freeboard of not less than 0.5m is maintained at all times during the dredging operation.

Two licenced decant water discharge points will be utilised for the existing WB reclamation area and one decant licenced discharge point from the WBE reclamation area to release water into Port Curtis. A conventional drop inlet structure will be installed and connected to an outlet culvert through the bund wall.

Environmental management measures relating to the management and discharge of decant water is included in the Dredging EMP.

7.7 Services

7.7.1. Water supply and storage

The Project does not require permanent facilities for the supply of raw or treated water to the WBE reclamation area during any phase of the Project. Future uses of the WB and WBE reclamation areas may require permanent services, these requirements will be addressed as part of the future land use development application process.

Treated water required to service the dredger activities will be sourced from existing GPC facilities within the existing Auckland Point wharf area.

7.7.2. Treated water

Treated water will be required to service potable water requirements onsite associated with office, ablutions and other minor and miscellaneous activities. Treated water will be sourced from existing Gladstone Regional Council or GPC facilities and supplied by road transport into temporary tanks, with a maximum typical size of 20,000 litres and located within the reclamation construction compound.

7.7.3. Raw water

The WBE reclamation area will typically only require a source of raw water for dust suppression during quarry activities and the construction of the bund walls. Raw water will be able to be sourced via a temporary connection from the existing GPC raw water network within the Fisherman's Landing Precinct or the existing dam water near GPC's Ticor quarry.

7.7.4. Sewerage

Permanent sewerage services will not be established to the proposed WBE reclamation area during either the reclamation bund wall construction or dredged material placement phases of the Project. Temporary toilet facilities will be provided at the site compound for the duration of the construction. A licenced contractor will regularly collect waste from any temporary toilet facility for disposal offsite. Future uses of the WBE reclamation area that may require a sewerage service will be addressed prior to their establishment.

7.7.5. Energy

Where existing mains power is located adjacent to the reclamation area construction compound, a temporary connection will be installed where practical. Where mains power connection is not available, generators will be utilised for the provision of power into the construction compound and for temporary construction lighting requirements. No permanent power services are proposed to service the reclamation area post reclamation activities.

7.7.6. Communication

It is likely that mobile telecommunications will be utilised for the majority of Project communications, however existing nearby cables will be used where practical to service the reclamation area construction compound. No permanent services are proposed.

7.8 Navigational aids

The key operational infrastructure associated with the Project is the removal of two existing navigational aids (i.e. one front lead light and one rear lead light), the relocation of five navigational aids (i.e. beacons and lead lights) and the installation of five new navigational aids (i.e. beacons and lead lights). Outer BUF and bund wall warning lights will be installed every 100m along the outer BUF and WBE seaward reclamation area bund wall in accordance with MSQ requirements.

MSQ requires navigational aids to be located in the Gatcombe and Golding Cutting Channels to ensure safe boating and passage for commercial vessels. The proposed location and configuration of the navigational aids are in accordance with the recommendations of the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and were developed in consultation with the Regional Harbour Master.

The removal of the navigational aids will involve a barge and a pile extractor, they will then be removed from the water by a crane on a barge, and delivered to an existing Port facility in Gladstone.

The installation of the relocated and new navigational aids will involve the following steps:

- Relocated piles will be removed from their current location and transported via barge to an existing Port facility/storage yard (e.g. Auckland Point wharf area)
- New piles will be loaded onto a barge at an existing Port facility (e.g. Auckland Point wharf area) and transported to the proposed location
- The pile will be attached to a crane on the barge and lifted and moved into a vertical position, then the pile hammer will be attached to the head of the pile
- Once the pile is in the correct position, the pile will be lowered to the seafloor by the crane, and the hammer will start driving the pile utilising small hammer drops to ensure the penetration is vertical and the position is not affected as it penetrates the soil
- The hammer will continue to drive the pile until the design depth is reached and soil presents the specified resistance
- Welders will prepare the surface and install the pile cap and platform, and pile protection material application will be undertaken using divers if required
- Batteries, solar panels and the specified lights will be installed at the piles in accordance with MSQ requirements
- The new navigational aids will be tested as part of the commissioning phase, prior to becoming operational.

The estimated timeframe for the navigational aid works is summarised in Table 7.3. One barge and one work boat will undertake the proposed navigational aid works over a 2 to 3 month period.

Table 7.3 Estimated timeframe for navigational aid works

Navigational aid task	Estimated average timeframe
Removal of existing navigational aids (piles)	1 to 2 days per pile
Installation of piles at new location	2 to 3 days per pile
Fit equipment on piles	2 to 3 days per pile
Pile protection	3 to 4 days per pile
Install electronics	1 to 2 piles per day

The navigational aid relocation and installation methodology will be confirmed and approved by MSQ prior to work commencing.

7.9 Reclaimed land surface stabilisation and maintenance activities

Following the completion of the filling operations within the WB and WBE reclamation areas, GPC will undertake surface stabilisation works for the portion of the reclamation area that has achieved the final design surface level. These works are likely to include capping the final surface with material of an appropriate grade or vegetating with appropriate species.

Maintenance activities on the reclamation area will also be undertaken to minimise dust and erosion as required as outlined in Section 8 of this Project EMP.

7.10 Sediment quality

A detailed geochemical investigation was undertaken as part of the Project. The investigation was undertaken throughout the entire Project footprint. A sampling program of boreholes, grab samples and subsequent laboratory analysis was undertaken at the following areas relevant to the Project:

- Channel duplication area
- Barge access channel
- WBE reclamation area.

The assessment of Project geochemical data was undertaken in accordance with the National Assessment Guidelines for Dredging 2009 (NAGD) and also the National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amendment 1, 2013) (NEPM 2013) as the future land use of the WBE reclamation area will be port-related industrial.

Results from the geochemical investigation demonstrated that all the areas included in the investigation and assessment were demonstrated as ‘clean’ as per NAGD (2009) and is therefore chemically suitable for placement within the WBE reclamation area.

No contaminants were detected above the NEPM (2013) recreational/open space or commercial/industrial guideline levels.

An environmental risk assessment was undertaken in accordance with the process set out in NEPM (2013) in order to assesses the risk posed to terrestrial ecosystems from adverse effects of contaminants in soil. There were no contaminants identified at concentrations exceeding the environmental risk assessment.

7.10.1. Acid sulfate soils

Acid sulfate soil (ASS) investigations were undertaken in conjunction with the geochemical investigation as part of the Project EIS, to determine the likelihood of actual acid sulfate Soils (AASS) and potential acid sulfate Soil (PASS) being present in the dredged material (which will be placed with the WB and WBE reclamation areas) and the existing sediments within the WBE reclamation area.

During the ASS investigations, grab samples were collected placed in plastic bags for laboratory ASS analysis and field pH testing.

7.10.2. Western Basin Expansion reclamation area

The presence of PASS was evident across the majority of sediments sampled within the WBE reclamation area. While there was no evidence of the presence of AASS, almost all sampling locations indicated the presence of PASS throughout the vertical profile. Sediments within the WBE reclamation area also contained a high level of acid neutralising capacity.

7.11 Associated infrastructure

The Port of Gladstone's maritime infrastructure is made up of a variety of wharf facilities, channels, two dredged material placement sites and reclamation areas which have been identified as required for future port facilities.

- The Port is made up of six wharf facilities, Fisherman's Landing, R G Tanna Coal Terminal, Auckland Point Terminal, Barney Point Terminal, South Trees Wharf and Boyne Island Wharf, comprising 15 berths.
- Newly developed Curtis Island infrastructure for LNG is made up of three wharf facilities, Queensland Curtis LNG (QCLNG), Gladstone LNG (GLNG) and Australia Pacific LNG (APLNG).
- Newly developed Wiggins Island Coal Terminal wharf facility.
- The Port channels total approximately 40km in length from Fisherman's Landing and the LNG precinct to the Fairway Buoy at the mouth of Port. The majority of outer harbour channels are approximately 180m wide and 16m deep (LAT). The middle and inner harbour channels have varying widths and depths.

The shipping channels, western basin channels, LNG berths and other lawful structures currently approved for maintenance dredging under GPC's existing Environmental Authority.

7.12 Key tenancies and stakeholders

Identified tenancies close to the works and key stakeholders may include but are not limited to:

- LNG Project Proponents
- GPC contractors
- Surrounding industries and their wharf centres
- Local residents and community
- Government Agencies
- Other users of the Port of Gladstone
- The GPC Stakeholder Representative Group.

8. Environmental management measures

In order to facilitate the effective implementation of these management measures, they have been categorised to their relevant Project activity component, summarised as the following:

- Construction of the WBE reclamation area, bund walls and BUF, including transport of quarry materials and site offices prior to dredging commencement
- Stabilisation and maintenance activities on the WB and WBE reclamation areas post dredging commencement
- Installation of new navigational aids.

This section contains the environmental mitigation measures to be implemented by the Project relevant to the Project components outlined above.

The roles and responsibilities for implementing the environmental mitigation measures below are described in Section 6.1.

8.1 Acid sulfate soils

ASS investigations found PASS and high acid neutralising capacity from the sampled sediments in the areas to be dredged and the WBE reclamation area. However, any potential risks of ASS are required to be managed in order to prevent adverse impacts to the receiving environment as a result of ASS. The removal and installation of navigational aids will not involve the removal of soils and as such, there is minimal impact from PASS anticipated from this activity.

Some of the material to be dredged contains PASS which will be managed under the Dredging EMP during dredging. This Project EMP will manage PASS within the WB and WBE reclamation areas post dredging during the maintenance phase of the Project.

As a minimum, the controls below will be implemented to manage the risk of potential ASS disturbance as well as implementing the management measures outlined in the Acid Sulfate Soils Management Plan (ASSMP).

Objectives	• Prevent contamination of the marine environment from the disturbance and/or oxidation of ASS material • Ensure no impacts to surface water or marine water quality occurs resulting from the disturbance of ASS material • Ensure no damage to infrastructure or equipment occurs as a result of ASS disturbance and/or handling • Ensure all personnel attend the environmental induction that will include ASS awareness training.			
Potential impacts	Refer to Appendix E			
Actions	**Actions**	**Project activity**		
		WBE and BUF construction	**WB and WBE maintenance**	**Navigational aids**
	• During detailed design, the WB and WBE reclamation areas groundwater will be modelled to determine the predicted permanent groundwater table in order to include PASS below this level (i.e. the safe PASS reinternment level (SPRL))	✓		
	• Design specifications will avoid disturbance of marine and terrestrial surface and subsurface soils, where practical. Where disturbance is unavoidable, the design specification will endeavour to minimise the disturbance footprint.	✓		
	• Key construction personnel will be provided mandatory training in the identification and control procedures for ASS and a register maintained	✓	✓	

	• To prevent the oxidation of PASS material through the potential creation of a 'mud wave' during bund wall construction: – Unconsolidated materials (i.e. the mud wave, if generated) above the mean high water neap will be excavated and contained separately in a designated treatment area – Excavated materials will be tested by a National Association of Testing Authorities (NATA) accredited laboratory for SPOCAS and treated with the required amount of aglime – Sediments will be validated at a rate of 1 sample/1,000m^3, prior to re-instatement into the reclamation area. Validation shall confirm, using SPOCAS analysis, that the sediment has no potential acidity and the laboratory calculated liming rate is < 1kg $CaCO_3$/tonne.	✓		
	• Material within the bund walls will be re-distributed as required so that it remains permanently under water where practicable, or if exposed to the atmosphere for a significant length of time, it is treated appropriately in compliance with the ASS Management Plan	✓	✓	
	• Daily inspection of the base of the bund wall for potential impacts of mud wave, resulting in soil being excavated above the natural level and exposed to oxygen. Should daily inspections observe excavated soil above the natural level, this will be collected and transported to a containment area for treatment.	✓	✓	
	• Removal of intertidal vegetation will be restricted to the minimum required, to enable the safe construction and operation of the WBE reclamation area, including minimising disturbance to ecologically sensitive areas, such as adjacent seagrass and mangrove communities	✓		
	• Mangroves will be removed at ground level, with roots left in-situ (where practical), to maintain soil stability and reduce sediment disturbance.	✓		
	• Establishment of a groundwater monitoring network and monitoring plan for the WB and WBE reclamation areas once dredged material placement and earthworks have been completed and the WB and WBE reclamation areas are stable. Groundwater monitoring piezometer installation will not be undertaken during the construction of the WBE reclamation area as piezometers are likely to be broken/demolished if installed prior to finalisation of earthworks.		✓	
	• Groundwater monitoring for acidity will occur on a regular basis, with samples analysed for: – Field measurements: water level, pH, electrical conductivity, redox potential and total alkalinity – Laboratory analysis: pH, electrical conductivity, total titratable acidity, total alkalinity, dissolved iron and aluminium and dissolved ions (chloride and sulphate)		✓	

Performance indicators	• No exceedances of trigger values outlined in the ASSMP • No visual observations of ASS impacts during routine inspections • No decline in terrestrial or marine plant health as a result of exposure to ASS or PASS • No decline in the water quality of localised watercourses or the marine environment.
Monitoring	• Regular auditing will be undertaken to confirm that bund wall construction is carried out in accordance with the defined requirements set out in the ASS Management Plan and associated management documentation • The design specification will not be approved where it does not demonstrate an attempt to avoid, or minimise, the disturbance to ASS material • Bund wall construction will not commence until an ASS Management Plan has been prepared and approved for implementation during all phases of the Project • Daily inspection of the base of the bund wall for potential impacts of mud wave, resulting in sediment being excavated above the natural level and exposed to oxygen. Should daily inspections observe excavated sediment above the natural level, this will be collected and transported to a containment area for treatment • Monitoring parameters and provisional limits for groundwater are to be based on established 'baseline' values and set at: – pH – outside 6.5 to 8.5 – Acidity – < 40mg/L – Alkalinity – > 60mg/L.
Reporting	• GPC will keep a register of ASS monitoring results and maintain the records in accordance with Section 6.16 of this Project EMP • All records and associated permits will be provided to the relevant authority as required, upon request and/or at the completion of construction activities • All complaints or incidents that are received by the contractor will be reported to GPC. GPC will report these as per Section 6.14 of this this Project EMP.

Corrective action/s	• If the pH of groundwater falls outside the 'baseline values', the following steps will be undertaken: – Initially increase monitoring frequency at affected location(s) to fortnightly until corrective measures are implemented or parameters return to within performance criteria • If the performance criterion in groundwater wells is not being met after two months, and the non-compliance cannot be attributed to short term heavy rainfall or external influences, consideration is to be given to the installation of lime cut off trench or other additional treatment measures in consultation with the GPC Environmental Manager. • In the event of an incident relating to the release of acid leachate, runoff or sediment occurring: – The GPC Environment Manager should be notified as soon as practicable as per Section 6.6 of this Project EMP – The area will be identified and hydraulically isolated using suitable mitigation measures – The runoff/sediment is to be treated with an adequate quantity of fine agricultural lime and samples analysed for pH prior to release. Runoff/sediment to have a pH of 6.5 to 8.5 prior to release. • An investigation into to the cause of the incident will be conducted, and a review of the mitigation measures be initiated.

8.2 Air quality management plan

Air quality impacts may be generated by dust and construction equipment emissions from the WBE reclamation area bund wall construction and the stabilisation and maintenance activities. Minor emissions will be generated from vessels used in the installation of navigational aids. Air quality and emissions management associated with the Project is provided below.

Objectives	• Prevent air quality impacts at nearby sensitive receptors • Compliance with approval conditions and this Project EMP. • Compliance with environmental values of the *Environmental Protection (Air) Policy 2008* (EPP (Air)) and other relevant legislation, including the NGER Act.			
Potential impacts	Refer to Appendix E			
Actions	**Actions**	**Project activity**		
		WBE and BUF construction	**WB and WBE maintenance**	**Navigational aids**
	• Watering of haul roads for the haulage of material around the bund wall	✓		
	• Watering to ensure material being dozed or graded is damp or applying suppressants to reduce emissions from completed sections of the bund wall.	✓	✓	
	• Watering of the reclamation area, following dewatering of the dredged material placement to reduce wind blown dust		✓	
	• Wheel wash stations and/or vibration grids should be used at both ends of haul route from the quarry to the WBE reclamation area to reduce dust/mud deposition on public road	✓		
	• Speed limits will be enforced to minimise dust generation	✓		
	• Vehicle movement will be restricted to existing roads and tracks, wherever practicable	✓	✓	
	• Measures to reduce fuel consumption and GHG emissions include the following: – Selection of fuel efficient machinery and vehicles matched to the delivery requirements where possible – Optimisation of transport of materials through load optimisation and delivery scheduling – All equipment will be serviced and maintained according to requirements of this Project EMP (refer Section 6.9)	✓	✓	✓

	• The potential for the use of bio-diesel will be considered and evaluated by GPC during the detailed design phase of the Project	✓		
	• All marine plant and equipment must be maintained to minimise the discharge of noxious fumes and pollutants	✓		✓
	• Vessels must be registered and in survey as required by Australian law and to the International Maritime Organisation (IMO) guidelines	✓		✓
	• Key personnel will be provided mandatory training in the potential Project air quality impacts, sensitive receptors and mitigation measures to be implemented	✓	✓	✓
	• Exhaust emissions from diesel generators will be released at a point that is 2.5 times higher than buildings or structures within 10 stack heights of the exhaust	✓	✓	
Performance indicators	• Comply with relevant air quality objectives at locations of sensitive receptors • No air quality related complaints • No noxious or offensive odours or fumes that impede works being completed safely and / or that causes environmental nuisance at a nuisance sensitive place			
Monitoring	• Log books are maintained by the contractor and are available for viewing by GPC • The works areas and associated access areas may be inspected by GPC in accordance with this Project EMP to assess the effectiveness of control strategies (refer Section 6.11) • Audits are conducted by GPC in accordance with this Project EMP (refer Section 6.11) • Additional air quality monitoring will be conducted as required, in response to air quality complaints • A daily odour survey will be conducted downwind of the boundary of the WBE reclamation area following commencement of dredged material placement.			
Reporting	• GPC will maintain records of all inspections in accordance with this Project EMP (refer Section 6.16) • All complaints or incidents that are received by the contractor should be reported to GPC. GPC will report these in accordance with this Project EMP (refer Section 6.14) • All records required by this plan and associated permits must be provided by the contractor to GPC upon request and/or at the completion of construction activities.			
Corrective action/s	• The contractor will schedule maintenance and / or corrective actions as required for equipment issues • In consultation with GPC, the contractor will identify cause of any incident or nuisance, and institute preventative actions to prevent a re-occurrence • GPC to review this Project EMP (refer Section 6.180).			

8.3 Aboriginal cultural heritage

An Indigenous Land Use Agreement (ILUA) is in place between GPC and the Port Curtis Coral Coast (PCCC) native title claimant group and the state of Queensland. In addition to this ILUA, a Cultural Heritage Protocol (the Protocol) was entered into by the ILUA parties on 23 March 2014, to ensure the protection and management of all Aboriginal cultural heritage in the ILUA area in relation to all port related operations (proposed or undertaken).

In accordance with the Protocol, surveys of the area were conducted as part of the EIS process in consultation with PCCC representatives. During these surveys PCCC representatives highlighted the fact that the Project impact areas must be viewed in the context of the larger, surrounding area and the other known sites, including quarries and stone sources, artefact scatters and resource areas, which hold high levels of cultural significance. Participating PCCC representatives advised of the potential for the Project to impact both on recorded and unrecorded ecological locations and archaeological sites that may exist within the confines of the Project impact areas.

As a minimum, the controls below will be implemented to manage the potential risk to Aboriginal cultural heritage in the vicinity of the Project.

Objectives	• Ensure Aboriginal Heritage items / areas are not impacted • Compliance with relevant legislation, approval conditions, the Protocol and management plans.
Potential impacts	• The Project has potential to impact on Aboriginal cultural heritage through impacts to the ecological functioning and the natural physical processes in the surrounding area.
Actions	• All works must be remain within the approved footprint and seek to minimise all disturbance associated with the Project • Consultation should continue between GPC and the PCCC in order to achieve the objectives of the Protocol • Prior to commencement of construction activities, GPC staff and contractors who will be engaged in works and who are likely to have contact with Aboriginal cultural heritage to participate in a cultural heritage induction session, jointly presented by GPC and a suitably qualified representative of the PCCC • Key personnel will be provided mandatory training in the potential Project Aboriginal cultural heritage impacts and mitigation measures to be implemented • Should an item or object of historical Aboriginal cultural heritage significance be found during Project activities GPC will implement the New Discoveries provision for incidental finds of Aboriginal cultural heritage found during Project activities provided in Section 10.2 of the Protocol, including the following: – All work at the location of the potential find should be ceased and the contractor will notify the GPC Environment Manager – GPC's Environmental Advisor will undertake appropriate actions and provide management recommendations to the contractor.

Performance indicators	• All works associated with the Project are conducted in accordance with the Protocol and within the Project footprint • No heritage complaints or incidents associated Project works.
Monitoring	• The PCCC sea rangers will be given the opportunity by GPC to monitor a component of the potential impacts of the Project marine activities.
Reporting	• All complaints or incidents that are received by the contractor should be reported to GPC (refer Section 6.14) • All records required by this plan and associated permits must be provided by the contractor to GPC upon request and/or at the completion of construction activities.
Corrective action/s	• GPC to review this this Project EMP (refer Section 6.18) • In consultation with GPC, the contractor will identify cause of the incident or nuisance, and institute preventative actions to prevent a re-occurrence.

8.4 Non-Aboriginal cultural heritage

Activities associated with the Project have the potential to directly and indirectly impact on items of non-Aboriginal cultural heritage within the vicinity of the Project. The Great Barrier Reef is a listed cultural heritage item that has the potential to be impacted by the Project, however the area's heritage listing relates to the size and diversity of ecosystems. The heritage values of the Great Barrier Reef will be protected through other management measures which protect ecological values within the vicinity of the Project.

A number of listed sites/places of historic heritage importance and recorded shipwreck sites identified during the desktop assessment are located outside the Project direct impact areas but are located within a 5km radius of the Project activities. Sites/places above high water and within the Gladstone and Targinnie areas are unlikely to be indirectly impacted by Project activities due to the separation distance between the heritage sites/places and the Project impact area.

Heritage items that may be impacted by the Project include items below the highwater mark such as some of the recorded shipwrecks within the vicinity of the Project and any other unexpected heritage finds.

As a minimum, the controls below will be implemented during the establishment of the WBE reclamation area bund walls and the installation of the navigational aids to manage the potential risk items of Non-Aboriginal cultural heritage in the vicinity of the Project.

Objectives	• Ensure non-Aboriginal cultural heritage items/areas are not impacted • Compliance with relevant legislation, approval conditions and management plans.
Potential Impacts	Heritage items below the highwater mark may potentially be adversely impacted, including damage to the physical fabric as well as the effects of increased light and/or noise on the site/place.
Actions	• Known shipwreck locations to be avoided by Project activities • Ensure that all employees are suitably trained to identify cultural heritage sites or objects and report the finds to the GPC Environment Manager • Inform all employees of their obligations to notify the Environment Manager of any cultural finds • Key personnel will be provided mandatory training in the potential Project cultural heritage impacts and mitigation measures to be implemented • Should an item or object of historical non-Aboriginal cultural heritage significance be found during Project activities the following measures will be adopted: – All work at the location of the potential find should be ceased and the GPC Environment Manager will be notified – The GPC Environment Manager will undertake appropriate actions and provide management recommendations to the contractor. • GPC's Environmental Manager will notify the DES of any relevant finds in accordance with Section 89 of the *Queensland Heritage Act 1992*.
Performance indicators	• No heritage complaints or incidents associated with the Project • No works conducted outside approved bounds.

Monitoring	• Monitoring of cultural heritage will be managed through the actions outlined above and reporting requirements should an item of cultural heritage be found during the Project.
Reporting	• All complaints or incidents that are received by the contractor should be reported to the GPC Environment Manager (refer Section 6.14) • All records and associated permits will be provided to the relevant authority upon request and/or at the completion of construction activities.
Corrective action/s	• GPC to review this this Project EMP (refer Section 6.18) • In consultation with GPC, the contractor will identify cause of the incident or nuisance, and institute preventative actions to prevent a re-occurrence.

8.5 Fauna management plan

Construction of the WBE reclamation area and associated infrastructure, and the stabilisation and maintenance activities on the reclamation area, as well as the installation of new navigational aids have the potential to directly and indirectly impact on both fauna species and fauna habitat values in the area surrounding the Project. Potential impacts of the Project on ecological values in the area, including fauna and fauna habitats (i.e. terrestrial vegetation, intertidal and coastal areas, coral reef and seagrass meadows). Potential impacts of the Project on environmental values of the surrounding area are provided in Appendix E.

As a minimum, the controls below will be implemented to manage the potential risk to fauna.

Objectives	• Adhere to the relevant statutory provisions and other obligations relating to wildlife management • Minimise indirect impacts to native terrestrial, intertidal and marine fauna (including conservation significant species), and reduce direct impacts to the extent necessary to enable the safe operation of the Project.			
Potential impacts	Refer to Appendix E			
Actions	**Actions**	**Project activity**		
		WBE and BUF construction	**WB and WBE maintenance**	**Navigational aids**
	• If practicable, construction of the WBE reclamation area and BUF will be scheduled to occur outside of the critical migratory bird visitation periods	✓		
	• A pre-construction fauna habitat survey will be conducted by a suitably qualified and experienced person, to detect and record details of animal breeding places (as defined under Schedule 5, Section (1) of the NC Reg) within the Project direct impact area and surrounds, and obtain additional site-specific information to supplement existing fauna data. The survey extent will include the Project direct impact areas associated with the WB and WBE reclamation areas, BUF and construction compounds, including a 100m buffer (note: where additional impact areas are required, this mitigation measure will apply). Where required, a Species Management Plan (SMP) will be developed in accordance with the requirements of the Nature Conservation (Wildlife Management) Regulation 2006, and approvals to operate under the SMP will be obtained as required, and in accordance with Section 88 of the NC Act, and pursuant to Section 332 of the NC Reg, to authorise any unavoidable interference with animal breeding places (as defined under the NC Reg).	✓		

	• Where breeding habitats, such as hollow-bearing trees or nests, are located within the Project impact areas, or where they have the potential to be impacted, measures to protect or appropriately manage these habitats will be developed in accordance with the Nature Conservation (Wildlife Management) Regulation 2006. These measures will be included in the Fauna Management Plan (FMP) prior to construction or impacting activities being undertaken, and will address the following:
	  • Potential impacts to native terrestrial and intertidal animal breeding places, resulting from Project activities
	  • Site-specific and practical management actions to avoid or minimise both the potential immediate and long-term impact/s of removing an animal breeding place
	  • Monitoring and reporting requirements that demonstrate how management actions will be effectively implemented and will produce the intended results.
		✓		

	• The design will consider the potential residual fauna impacts (if present), and the adequate compensation through the provision of offsets, if required	✓		
	• The FMP will be finalised prior to construction using site-specific detail obtained during pre-construction fauna habitat surveys. The FMP will incorporate the mitigation measures to avoid or minimise potential impacts to native terrestrial and intertidal fauna, within areas that have the potential to be impacted by Project activities.	✓		
	• The survey for and management of wildlife will be undertaken by suitably qualified personnel with the appropriate permits and licences (e.g. fauna spotter catchers to have appropriated damage mitigation permits).	✓		
	• Wildlife load reduction measures will be implemented and conducted by a suitably qualified ecologist.	✓		

	• Where practicable, the construction of the WBE reclamation area bund wall that is nearest to the coastline will be scheduled to occur from March to September (i.e. outside of the critical migratory bird visitation periods for the majority of species visiting Port Curtis) (as presented in Appendix 3 (Timing of Migration) of the Gladstone Ports Corporation Report for Migratory Shorebird Monitoring Port Curtis and the Curtis Coast Annual Summer Survey 2016). Migratory birds are still likely to be present in the area outside of the March to September period, therefore measures relating to migratory shorebirds and their habitat will be implemented as required during the construction period (i.e. not restricted to these months).	✓		
	• During the WBE reclamation area and BUF detailed design phase the need for a terrestrial pre-construction fauna habitat survey, NC Act and VM Act approvals will be decided in consultation with DES. If NC Act and/or VM Act approvals are required for the Project, these approvals will be obtained prior to construction commencing.	✓		
	• Prior to construction commencing, the requirement for a High Risk Species Management Program (High Risk SMP) will be decided in consultation with DES, in order to determine if impacts to conservation significant species is likely. If it is determined that an approved High Risk SMP is necessary, approval will be obtained prior to construction commencing.	✓		
	• During pre-construction activities, all personnel operating vehicles will be made aware of the potential to encounter native fauna, including conservation significant species, as well as the requirements for reporting injured/trapped fauna	✓		
	• Appropriate signage will be installed, where practical, to promote driver awareness and provide safety for fauna crossing or inhabiting the area. Reduced speed zones will be established within sensitive areas, to be determined prior to construction	✓		
	• Any works occurring within sensitive habitats (e.g. shorebird habitat) will be conducted in the presence of a fauna spotter catcher.	✓		
	• The fauna spotter catcher will have the authority to initiate a 'stop-work' order within the buffer zone of an active breeding place (i.e. 50m for all raptor, owl, and conservation significant species; 30m for all other species). In this event, the spotter catcher will determine the appropriate management of the breeding place in accordance with the management measures included in the FMP (as developed following the pre-construction survey) and in accordance with all relevant permits and approvals.	✓		

	• The fauna spotter catcher will relocate any displaced fauna to a suitable recipient site, in the event that the animal is not injured. All injured animals (native or introduced) will be taken to receive immediate veterinary attention.	✓		
	• If an animal is injured during construction activities, works in the immediate area of the animal will cease immediately and will not recommence until rescue actions have been taken. A review of construction activities will be undertaken following the event, to minimise the risk of the event reoccurring. The results of the review will be communicated to the relevant personnel, including the requirement to adapt alternative construction methods and/or additional mitigation measures.	✓		
	• Key personnel will be provided mandatory training in the potential Project fauna impacts, sensitive receptors and mitigation measures to be implemented	✓	✓	✓
	• Speed limits will be enforced during construction, to prevent injuries to native fauna	✓		
	• Vessel speed limits will be enforced within the Project impact areas to reduce the potential for injury to marine fauna. Go slow zones will be established in shallow areas, less than 5m in depth.			✓
	• All personnel operating vehicles will be made aware of the potential to encounter native fauna, including conservation significant species, within the Project direct impact area	✓	✓	✓
	• Where night lighting is required (i.e. cannot be avoided), the lights will be directional to avoid light spill into adjacent marine, intertidal and terrestrial areas, and appropriate bulbs will be selected and used to reduce potential impacts on marine fauna (e.g. to avoid impacts on marine turtle orientation).	✓	✓	✓
	• If fauna exclusion fencing is determined to be required as a result of the pre-construction fauna surveys, a detailed summary of exclusion fencing will be prepared and included in the FMP.	✓		
	• A marine species emergency response/notification plan will be developed to allow for the rapid and effective handling (e.g. capture and release) of marine fauna in the event that an incident occurs within Project impact areas.	✓		✓
	• A stranded marine species emergency response/notification plan will be developed to allow for the rapid and effective capture and release of marine fauna, should a stranding incident occur within intertidal areas that have the potential to be impacted by Project activities	✓		

	• Appropriate signage will be erected in prominent positions to promote awareness of marine fauna present within the area	✓		
	• During construction of the WBE reclamation area and BUF, migratory shorebirds will be monitored by a suitably qualified person (e.g. fauna spotter catcher, ecologist) to determine if adaptive management of Project activities is required. This will include monitoring impacts in response to a range of construction-related activities, including potential noise and dust impacts; vehicle movements; and the potential introduction and/or spread of pest species (e.g. foxes, wild dogs). Works will cease and mitigation measures developed where the suitably qualified person identifies that the Project activities are resulting in frequent alarm or flight responses, or avoidance of the area. The results of the monitoring will be reported and will include the identification of adaptive management measures to be implemented to avoid or reduce impacts on these species.	✓		

	• A bund wall closure plan will be prepared to manage potential impacts on marine and intertidal fauna species. This plan will include the following measures:
	  • When construction of the WBE reclamation area and BUF reaches the stage where the bund/sheet piling wall is to be closed, a suitably qualified and experienced marine spotter will be present to minimise the risk of marine fauna being stranded within the WBE reclamation area and BUF
	  • If there are any instances of overflow into the reclamation area or BUF once it has been closed, the area within the reclamation area or BUF bund will be immediately inspected for any stranded fauna
	  • Fish capture/salvage techniques will be implemented, as provided in the Fish Salvage Guidelines (DPIF 2004), if required
	  • All personnel involved in the capture and salvage of fauna will be appropriately inducted and trained
	Fauna exclusion measures will be installed on the seaward facing side of all discharge points to prevent fauna entering into the reclamation area via the discharge points. Exclusion measures will allow fauna within the reclamation area to leave and re-enter the marine environment (e.g. one-way gates).
		✓		

	• The bund wall/sheet piling wall closure plan will contain details on the following:
	  • Qualifications and training of personnel undertaking the capture and salvage and the methods to be used
	  • Details of the relevant permits under which the bund wall closure activities will be undertaken
	  • Overview of the bund/sheet piling wall closure schedule, including pre-closure meetings and checks
	  • Monitoring and reporting requirements.
		✓		

	• Hazardous substances with the potential to impact fauna and associated habitat will be stored within suitably contained and bunded areas, and located an appropriate distance from waterbodies and/or sensitive habitats.	✓	✓	
	• When construction of the WBE reclamation area reaches the stage where the bund is to be closed, a suitably qualified and experienced marine spotter will be present to ensure no marine fauna are stranded within the WBE reclamation area	✓		
	• If there are any instances of overflow into the bund once it has been closed, the area within the bund will be immediately inspected for any stranded fauna	✓		
	• Fish capture/rescue techniques will be implemented, as provided in the Fish Salvage Guidelines (DPIF 2004), as required	✓		
	• An exclusion gate will be constructed on the seaward extent of the bund wall to allow for the release of trapped marine fauna after construction works have ceased. The gate will be closed during low tide to prevent marine and intertidal fauna entering the site during high tide.	✓		
	• All vessel operators will be made aware of the potential for native fauna species, including conservation significant species, to occur within the Project direct and indirect impact areas, prior to construction	✓		✓
	• The Project direct impact areas will remain free of plastic shopping bags to reduce detrimental impacts to marine and migratory species that occur within the areas that have the potential to be impacted by the project activities	✓	✓	✓
	• Hazardous substances with the potential to impact fauna and associated habitat will be stored within suitably contained and bunded areas at a suitable distance from waterbodies and/or sensitive habitats	✓	✓	✓

<table>
<tr><td></td><td>

Appropriate signage will be erected in prominent positions to promote awareness of marine fauna present within the Project impact areas.

</td><td>✓</td><td></td><td>✓</td></tr>
<tr><td></td><td>

A marine fauna spotter will be present on all moving vessels larger than 7m in length, at all times and will conduct a pre-start search for marine fauna prior to the commencement of dredging, and will to continue to spot for marine fauna throughout dredging activities (i.e. continual observations during dredging). All fauna observations will be recorded and reported, as per the relevant approval requirements.

</td><td></td><td></td><td>✓</td></tr>
<tr><td></td><td>

An exclusion/safety zone will be created around the perimeter of the pile driving activities. During the works, a suitably qualified marine fauna spotter will be present to ensure that pile driving will not be carried out while:

Dugongs, turtles or other protected marine species are within 300m
Migratory birds are within 25m of operations

Activities will be placed on hold for the period of time it takes the animal to leave the safety zone of its own accord.
The following fauna safety shut-down zones will be also be implemented for continuous impact piling durations using the fauna spotter:

<table>
<tr><th colspan="2">Noise exposure threshold based on cumulative SEL (within a 24-hour period)</th><th>Observation zone</th><th>Shut-down zone</th></tr>
<tr><td>Duration with continuous piling @ 100 strikes / min</td><td>Cumulative SEL < 198dB re 1µPa^2·S</td><td></td><td></td></tr>
<tr><td>≤ 1 min</td><td>≤ 50m</td><td>1.0km</td><td>50m</td></tr>
<tr><td>10 min</td><td>310m</td><td>1.0km</td><td>310m</td></tr>
<tr><td>60 min</td><td>1.4km</td><td>2.0km</td><td>1.4km</td></tr>
</table>
</td><td>✓</td><td></td><td>✓</td></tr>
<tr><td></td><td>

Avoid conducting impact piling during the following times:

When marine mammals are likely to be breeding, calving, feeding or resting in biologically important habitats nearby
Humpback whale migration season from June to September
During marine turtle (Green turtle and Flatback turtle) peak nesting activity period from November to December.

</td><td>✓</td><td></td><td>✓</td></tr>
</table>

	• Standard operating procedures to be undertaken by contractors during piling activities include pre-start, soft start, normal operation, stand-by operation, and shut-down procedures, as follows: – Pre-start monitoring – the presence of marine turtles and marine mammals will be visually monitored by a suitably trained crew member for at least 30 minutes before piling commences using a soft start procedure – Soft start – if marine turtles and marine mammals have not been observed inside the shut-down zone during the pre-start observations, soft start may commence with piling impact energy gradually increased over a 10-minute time period. A soft start will also be used after long breaks of more than 30 minutes in piling activity – Normal piling – if marine turtles and marine mammals have not been observed inside the shut-down or observation zones during the soft start, piling at full impact energy may commence. Visual observations will continue throughout piling activities – Stand-by – if a marine turtle or marine mammal is sighted within the observation zone during the soft start or normal operation piling, the operator of the piling rig will be placed on stand-by to shut down the piling rig, while visual monitoring of the animal continues – Shut-down – if a marine turtle or marine mammal is sighted within or are about to enter the shut-down zone, piling activity should be stopped immediately. If the animal is observed to move outside the zone again, or 30 minutes have elapsed with no further sightings, piling activities will recommence with the soft start procedure. If a marine turtle or marine mammal is detected in the shut-down zone during a period of poor visibility, operations will stop until visibility improves	✓		✓

	• Where noise related incidents occur while implementing standard operating procedures, investigate and validate (via site acoustic testing) the effectiveness of the following measures noise mitigation measures: – Lower piling duration/piling strike number per day – Use of piling noise attenuation measures: ▪ Air bubble curtains. Air bubble curtains are designed to infuse the water column surrounding the pile with air bubbles, generating a bubble screen that attenuate the sound propagation from the pile. For a mid-sized steel pile as used in this project (with a dimension greater than 24 but less than 48 inches), the previous experiment data indicates that an air bubble curtain will provide about 10 dB of noise reduction. ▪ Isolation casings. Isolation casings are hollow casing slightly larger in diameter than the pile to be driven. The casing is inserted into the water column and bottom substrate, and then dewatered so that the work area could be isolated from the surrounding water column in order to attenuate the sound propagation. Dewatered isolation casings generally can be expected to provide attenuation that is at least as great as the attenuation provided by air bubble curtains. ▪ Cushion blocks. Cushion blocks consist of blocks of material atop a pile during piling to minimise the noise generated during impact hammering. Materials typically used for cushion blocks include wood, nylon and micarta blocks. The resulted noise reduction could be from a few dB to over 20 dB. This measure can be used in conjunction with air bubble curtains or isolated casings as above.	✓		✓

- Noise spot checks should be conducted at nearby shorebird roosts during construction (i.e. Friend Point shorebird roost) and compared to the following guidelines for migratory shorebirds. Works should cease and mitigation measures developed as appropriate where noise spot checks determine that 'moderate impacts on habitat use', or 'avoidance of area' disturbance is likely to occur.

Disturbance effect	Steady or continuous noise sources (LA_{eq}(15min)(dBA)	Episodic (single event or short-term) noise sources LA_{max} (dBA)	Typical bird activities potentially impacted
Occasional (Alert) – minor impacts on habitat use for most species	50 to 65	45 to 60	Nesting
Frequent (Alarm or Flight) – moderate impacts on habitat use	65 to 85	60 to 80	Nesting Roosting
Avoidance of area – by most of the population of some species	≥85	≥80	Nesting Roosting Foraging

Table notes:

- Masking impacts, particularly on smaller songbirds, may occur at noise levels of approximately the alert threshold right up until the point of avoidance.
- LA_{max} limits have been specifically set below the LA_{eq} limits in recognition of considerations related to startle response

✓ | | ✓

- All vessel operators will be made aware of the potential for native fauna species, including conservation significant species, to occur within the Project direct and indirect impact areas, prior to construction

| | | ✓

Performance indicators	• No fauna injury or mortality is caused by Project related activities • No construction activities prior to: – Obtaining all other necessary permits and approvals for fauna management – Removal of terrestrial and intertidal habitat (i.e. mangrove and seagrass communities) is restricted to the Project direct impact area, in accordance with the relevant approvals • No avoidable environmental harm is caused within areas that have the potential to be impacted by Project activities. • No decrease in water quality occurs during maintenance activities on the WBE reclamation area.
Monitoring	• Every 6 months during the establishment of the WBE reclamation area, monitor the condition of adjacent marine plants within areas that have the potential to be impacted by Project activities, in accordance with the EHP Monitoring and Sampling Manual (EHP 2010), associated approval conditions, and management plans developed for the Project • The terrestrial and intertidal areas that have the potential to be impacted by Project activities will be monitored regularly throughout the WBE reclamation area construction phase, in order to detect and respond to pest and weed species, and other matters relating to the security of terrestrial and intertidal fauna and associated habitats • Inspections of all equipment will be undertaken, prior to piling commencement, to ensure that all required measures are being adopted to reduce the potential impact to marine fauna and associated habitats • Monthly monitoring of the condition of the WB and WBE reclamation areas, will occur during the first 12 months of the maintenance phase. Monitoring frequency will be altered to a quarterly program for a subsequent 2 year period, and then annually thereafter. Monitoring will include (but not restricted to) an assessment of rehabilitation success, erosion and sedimentation, and presence of pest and weed species. • Monitoring relating to water quality (refer to the Environmental Monitoring Procedure in Appendix A of this Project EMP).

Reporting	• GPC will maintain records of all inspections in accordance with this Project EMP (refer Section 6.16) • Records of all capture and release of fauna during wildlife reduction activities will be kept, and made available to the relevant authorities, in accordance with the FMP and relevant approval requirements • A Fauna Incident Register will be maintained to log any injury or death of native fauna during Project activities, in accordance with the FMP, High Risk SMP, and relevant approval conditions • External third party audits will be conducted annually throughout the operational phase, until rehabilitation efforts have stabilised the final landform, to ensure that: – Mitigation measures are being implemented effectively – Relevant performance criteria is being achieved – Activities are compliant with regulatory and project-specific requirements – Any non-conformances are recorded and appropriate corrective actions are implemented • All complaints or incidents that are received by the contractor should be reported to GPC. GPC will report these in accordance with this Project EMP (refer Section 6.14) • All records required by this plan and associated permits must be provided by the contractor to GPC upon request and/or at the completion of construction activities.

Corrective action/s	• If fauna habitat is incorrectly cleared/disturbed, the relevant authorities will be notified immediately, to advise of the breach and to confirm measures to be implemented to address the non-conformance • All other non-conformances will be corrected and reported within 48 hours • Death or injury to megafauna will be reported as an incident, and will be reported immediately, in accordance with the relevant incident response procedures and Project approval requirements • In the event that a marine fauna species becomes stranded, within an area that has the potential to be impacted by Project activities, the GPC Environment Manager will be notified as soon as is practicable. Construction personnel will avoid contact with the stranded species. The contractor will make a record of: – The precise location of animal – The species type. • If the animal is alive, the GPC Environment Manager will contact the Marine Stranding Hotline (1300 130 372) and details of the animal will be provided. Construction activities within the immediate vicinity and any additional activities which have the potential to cause stress to the animal will cease until Queensland Parks and Wildlife Service (QPWS) staff can remove the animal • If the animal is dead, the GPC Environment Manager will contact the Marine Stranding Hotline (1300 130 372), and details of the animal will be provided. Liaison with QPWS will occur to ensure the animal's remains are retrieved • In the case where a crocodile is identified within the Project direct impact area, the GPC Environment Manager will contact the Marine Stranding Hotline (1300 130 372). Under no circumstances will personnel approach the animal, whether it has been determined to be dead or alive • In the event of injury or mortality to native fauna, other than conservation significant species: – The CEnvO must be contacted immediately to capture or organise the possible capture of the animal for transportation to a specialist veterinarian or wildlife carer. The animal must only be handled by a person suitably qualified to do so. The location of the injured animal will be identified/marked so it can be found again – The species of animal will be identified, if possible, and its approximate size determined – The type of injury sustained will be identified, if possible (without handling or causing the animal further stress). • The cause of the incident will be investigated, and mitigation measures revised, if required to prevent a re-occurrence • GPC to review this this Project EMP as per Section 6.18.

8.6 Vegetation management plan

Construction of the WBE reclamation area and associated infrastructure, and the stabilisation and maintenance activities on the reclamation area have the potential to directly and indirectly impact on terrestrial and marine flora species and communities, through direct impacts such as removal of vegetation (i.e. seagrass) and also through increased turbidity and changes to water flows and sedimentation rates in intertidal area caused by the construction of the WBE reclamation area bund walls.

As a minimum, the controls below will be implemented to manage the potential risk to flora in the vicinity of the Project

Objectives	• Adhere to the relevant statutory provisions regarding vegetation clearing, and other vegetation management obligations relating to land management • Minimise indirect impacts to native terrestrial, intertidal and marine flora (including conservation significant species and communities), and reduce direct impacts to the extent necessary to enable the safe operation of the Project			
Potential impacts	Refer to Appendix E			
Actions	**Actions**	**Project activity**		
		WBE and BUF construction	**WB and WBE maintenance**	**Navigational aids**
	• If terrestrial vegetation clearing is required within areas mapped as a 'high risk' area on the flora survey trigger map, a vegetation survey will be undertaken by a suitably qualified person in accordance with the Flora Survey Guidelines – Protected Plants guideline (version 2.0, 2016) (or the most recent revision). This survey is required to determine if there are protected plant species within the Project impact areas that have the potential to be impacted by Project activities. In the event that protected flora species are located, and are likely to be impacted as a result of Project activities, an Impact Management Plan (IMP) will be developed which will include species-specific mitigation measures. All relevant permits must be obtained prior to clearing in accordance with the Flora Survey Guidelines – Protected Plants guideline (version 2.0, 2016) (or the most recent revision).	✓		
	• Conduct a pre-construction baseline mangrove community survey within the Project indirect impact area, including accordance with the DES Monitoring and Sampling Manual 2018: Environment Protection (Water) Policy 2009, Version February 2018 – 'Biological assessment: Monitoring mangrove forest health' (or the most recent revision).	✓		

	• A Bushfire Management Plan (BMP) will be developed and implemented and will include measures to minimise the risk of fire on areas of native vegetation.	✓		
	• The BMP will identify measures to minimise potential ignition sources associated with Project activities, including all earth-moving equipment will be fitted with fire arrestors.	✓		
	• The construction compound and other laydown areas will be located within existing cleared and/or disturbed areas that are considered to be of low ecological value, where practical.	✓		
	• The clearing or removal of terrestrial, intertidal or marine vegetation (where unavoidable) will be restricted to the minimum required to enable the safe construction and maintenance of the Project, including minimising disturbance to ecologically sensitive areas.	✓		
	• The clearing of vegetation and grubbing works (if required) will employ techniques that leave the root ball intact and minimise the disturbance of soil/sediments, where practical (e.g. cut the tree at the base and leave the root structure in situ).	✓		
	• Cleared vegetation will be stockpiled and mulched for use within the reclamation works area. Stockpiles will be placed in areas of low ecological value (i.e. existing cleared and/or disturbed areas), where practical.	✓		
	• Parking of vehicles, stockpiling, or storage of plant/equipment will not be permitted within areas of native vegetation. Tree protection zones will be established where Project impact areas are within/adjacent to vegetated areas, as identified by a suitably qualified person (e.g. arborist, ecologist, environmental officer/manager).	✓		
	• The health and extent of seagrass meadows, benthic macroalgae and the condition of coral reefs will be monitored within areas potentially impacted by Project activities as detailed within the Environmental Monitoring Procedure (Appendix Q3). This will include surveys during dredging and post dredging to assess the extent of these communities at multiple sites located within the low and moderate impact zones, and the zone of influence established for water quality parameters (outlined in the Environmental Monitoring Procedure).	✓		
	• Revise the Vegetation Management Plan, using information gathered during the pre-construction vegetation surveys, to mitigate the potential direct and indirect impacts on terrestrial and intertidal flora, within areas that have the potential to be impacted by Project activities. The VMP will contain management strategies for relevant terrestrial and intertidal flora species and vegetation communities	✓		

	• The condition of mangrove habitats will be monitored every 6 months within areas that have the potential to be impacted by Project activities, in accordance with the DES Monitoring and Sampling Manual 2018: Environment Protection (water) Policy 2009, Version February 2018 – Biological assessment: Monitoring mangrove forest health (or future versions). This will be undertaken for the duration of the Project activities, and for a 2 year period following the completion of Project activities.	✓		
	• Ensure clearing for the construction compound and other laydown areas are located within areas of low ecological value (e.g. disturbed/modified environments, non-remnant vegetation, etc.), where practicable	✓		
	• The design will take into consideration the re-establishment of connectivity through rehabilitation, and consolidation of existing fragmented areas will be incorporated into the design, where practicable	✓		
	• Obtain all necessary permits and approvals, under the relevant environmental legislation, and ensure that any clearing of vegetation, or removal of marine plants, is carried out in accordance with approval conditions	✓		
	• The design will avoid disturbance to marine vegetation (i.e. seagrass communities) where practicable. Where disturbance is unavoidable, the design specification will endeavour to minimise the disturbance footprint	✓		
	• Removal of terrestrial and/or intertidal vegetation will be restricted to the minimum required to enable the safe construction and operation of the Project, including minimising the disturbance on ecologically sensitive areas	✓		
	• Land clearing within or around wetlands will be avoided, where practicable	✓		
	• Vegetation clearing and grubbing works will involve techniques that do not disturb the vegetation root structure and soils below this level (e.g. cut near the base of tree trunks), where practicable	✓		
	• Cleared vegetation will be stockpiled and mulched for use within the reclamation works area. Stockpiles will be placed in low ecological value (degraded) locations, where practicable	✓		
	• Exclude parking of vehicles, storage of plant and equipment and stockpiling on intertidal communities	✓	✓	

	• Prevention of fire ignition and uncontrollable fires through appropriate measures, including fire arrestors on all earth-moving equipment, in accordance with the BMP	✓	✓	
	• Key personnel will be provided mandatory training in the potential Project flora impacts, sensitive receptors and mitigation measures to be implemented	✓	✓	✓
	• The hydrodynamic model for the reclamation area will be validated following completion of construction to determine actual sedimentation and erosion impacts. Management measures will be revised, if required, to reduce the potential for impacts on sensitive ecological receptors (e.g. seagrass meadows, water quality).	✓		
Performance indicators	• Collection of baseline terrestrial and intertidal vegetation data occurs prior to construction commencing • Obtaining all necessary vegetation clearing permits and approvals • All construction personnel attending the relevant vegetation management training and inductions. • Removal of terrestrial and intertidal vegetation is restricted to the Project direct impact area, in accordance with the relevant approvals • No avoidable environmental harm is caused through the disturbance of vegetation, within areas that have the potential to be impacted by Project activities • The final Project landform is stabilised efficiently, through the establishment of fast-growing, native, terrestrial/intertidal species.			
Monitoring	• The clearing impact area will be surveyed during the pre-construction phase, in order to supplement existing baseline vegetation data, to enable the determination of the effectiveness of the mitigation measures implemented during the pre-construction and construction phases • Monitor the condition of seagrass habitats in accordance with the Procedure (refer Appendix A). • Monitoring/inspections to ensure that all vegetation management measures required by this Project EMP are being implemented • Monthly monitoring of the condition of the reclamation area final landform, and areas that have the potential to be impacted by Project activities, will occur during the first 12 months of the maintenance phase, in accordance with the management plans developed for the Project. Monitoring frequency will be altered to a quarterly program for the subsequent 2 year period, and then annually thereafter. Monitoring will include (but not restricted to) an assessment of rehabilitation success, erosion and sedimentation, and presence of pest and weed species • Monitoring in the Project indirect impact area will occur until the final Project landform has stabilised.			

Reporting	• Internal audits will be conducted every 3 months, and external third party audits will be conducted annually for the duration of the construction and maintenance phases, to ensure that: – Mitigation measures are being implemented effectively – Relevant performance criteria is being achieved – Activities are compliant with regulatory and Project-specific requirements – Any non-conformances are recorded and appropriate corrective actions are implemented • All complaints or incidents that are received by the contractor should be reported to the GPC Environment Manager as outlined in Section 6.14 of this Project EMP • All records and associated permits will be kept in accordance with Section 6.16 of this Project EMP and provided to the relevant authority upon request and/or at the completion of construction activities.
Corrective action/s	In the event of a non-conformance, the actions below will be implemented. • If an area of vegetation is incorrectly cleared, the relevant authorities will be notified immediately, to advise of the breach and to confirm measures to be implemented to address the non-conformance • If an individual plant species has been identified as a conservation significant species, or is suspected of being one, and is unintentionally uprooted during clearing operations, then the actions below will occur. – The relevant authorities will be notified immediately, and their advice implemented – If practicable, the uprooted specimen(s) will be replanted as soon as practical in an area marked as a 'no go' zone or rehabilitation area • All other non-conformances will be corrected and reported to the GPC Environment Manager in accordance with Section 6.14 of this Project EMP • The cause of the incident will be investigated, and mitigation measures will be revised, if required, to prevent a re-occurrence. • GPC to review this Project EMP as per Section 6.18.

8.7 Pest and weed management plan

Pests and weed species from Project activities have the potential to adversely affect the biodiversity values of terrestrial areas and the Port of Gladstone. Biosecurity Queensland is responsible for managing known marine pests in Queensland and GPC has obligations and responsibilities to Biosecurity Queensland under the *Biosecurity Act 2014*. The Department of Agriculture and Water Resources administer the *Biosecurity Act 2014*, which deals with new pest incursions, and places obligations and responsibilities on operators within the Port of Gladstone.

As a minimum, the controls below will be implemented to prevent or minimise biosecurity impacts of pest and weed incursion in the vicinity of the Project.

<table>
<tr><td>Objectives</td><td colspan="4">• Adhere to the relevant statutory provisions regarding pest and weed management, in particular, the Biosecurity Act 2014 and other biosecurity obligations relating to land management
• Minimise the potential for environmental harm caused by the proliferation of invasive species (i.e. pests, weeds, and invasive ants), particularly those that are classified as prohibited matter, or restricted matter, under the provisions of the Biosecurity Act 2014
• Adhere to the applicable Australian and other recognised Standards, Codes of Practice, and pest strategies including (but not limited to):
• Australian Weeds Strategy (Natural Resource Management Ministerial Council 2007)
• Queensland Weed Spread Prevention Strategy (Department of Primary Industries and Fisheries 2008)
• DAWR Guidelines
• Australian Marine Pest Monitoring Guidelines (Department of Agriculture Fisheries and Forestry 2010)
• National System for the Prevention and Management of Marine Pest Incursions.</td></tr>
<tr><td>Potential impacts</td><td colspan="4">Refer to Appendix E</td></tr>
<tr><td rowspan="2">Actions</td><td rowspan="2">Actions</td><td colspan="3">Project activity</td></tr>
<tr><td>WBE and BUF construction</td><td>WB and WBE maintenance</td><td>Navigational aids</td></tr>
<tr><td></td><td>• A pre-construction baseline pest and weed survey will be undertaken to identify high risk species (location and abundance) within the Project direct impact areas. This survey will be used as a baseline to enable assessment against performance indicators during the construction phase. The survey will be conducted within the intertidal and terrestrial environments associated with the:
– WB and WBE reclamation areas and construction compounds (terrestrial and intertidal areas)
– BUF
– Quarry and haul route.
This survey will target both flora and fauna pest species.</td><td>✓</td><td></td><td></td></tr>
</table>

	• The PWMP will be updated using site specific detail obtained during the baseline pest and weed survey.	✓		
	• Prior to construction high risk areas will be identified (i.e. areas containing prohibited or restricted matters as defined by the Biosecurity Act) within the Project direct impact areas. Vehicle wash/blow-down facilities and procedures will be established for these areas to reduce the risk of the transport and potential spread of weed species and/or their propagules.	✓		
	• All vehicles and machinery will be visually inspected by an appropriately skilled person, prior to entering the Project impact areas	✓	✓	
	• Key personnel will be provided mandatory training in the potential Project pest and weed impacts and mitigation measures to be implemented	✓	✓	✓
	• All vehicles entering areas known to contain pest or weed species will be washed down before leaving that area	✓	✓	
	• Signs will be erected at entrance points, prompting the wash-down of all vehicles prior to entering non-infested sites	✓	✓	
	• All high-risk materials (e.g. imported soil) will be certified as free of weeds and pests prior to acceptance onsite	✓	✓	
	• Soil and fill material from high risk areas will not be transported to low risk areas.	✓	✓	
	• Avoid movement of soil and fill material from weed affected areas to 'clean' sites	✓	✓	
	• All declared prohibited or restricted plant matter (as defined by the *Biosecurity Act 2014*) detected will be controlled in accordance with the specific herbicide application procedure/s	✓	✓	
	• Individuals operating ground equipment for herbicide distribution will hold an unrestricted Commercial Operator's Licence (for ground distribution of herbicides) under the *Agricultural Chemicals Distribution Control Act 1966* • Where a person holds a Ground Distribution contractor's licence and uses an unlicensed operator (or group of unlicensed operators) to use ground equipment to carry out ground distribution of Agricultural Chemicals, they must: – Be present while ground distribution is being carried out (ie the licensed operator must never leave their post) • Maintain close supervision at all times (i.e. they should not issue instructions to the unlicensed operators before the ground distribution and then leave them to carry out the work on their own	✓	✓	

	• Avoid and/or minimise the use of herbicides and pesticides within or near intertidal/marine areas and drainage lines. Only use products that are specifically formulated for use in environmentally sensitive areas.	✓	✓	
	• Vehicle movement will be restricted to existing roads and temporary tracks, wherever practicable	✓	✓	
	• Food scraps will be removed from the Project impact areas every day so as to limit the potential for pest fauna species to enter Project impact areas.	✓	✓	✓
	• The use of herbicides and pesticides within and adjacent to intertidal/marine areas and drainage lines will be avoided and/or minimised. Products that are specifically formulated for use in environmentally sensitive areas will be used in these locations where required.	✓	✓	
Performance indicators	• No environmental harm is caused by introduction or proliferation of marine pest and/or weed species within areas that have the potential to be impacted by Project activities, during Project activities • No construction activities are initiated prior to the collection of baseline pest and weed data (presence and abundance), and the finalisation of the PWMP • Successful establishment of native vegetation during stabilisation efforts.			
Monitoring	• The areas that have the potential to be impacted by Project activities will be surveyed during the pre-construction phase, in order to gather baseline pest and weed data (i.e. record of presence and abundance of pest and weed species) • The areas that have the potential to be impacted by Project activities will be monitored frequently throughout construction phase, in order to detect pest and weed species • Regular inspections will occur within the terrestrial Project impact areas to identify and record any sightings of pest fauna species. Appropriate mitigation measures will be developed and implemented for pest fauna species to avoid and/or minimise potential impacts on native fauna species and their habitats (e.g. migratory shorebirds and roosting/foraging habitat). • Any sightings of any terrestrial pest fauna species will be maintained in a log and reported back to the Contractor's Environmental Manager • Major incidents resulting in a significant spread of weeds and/or pests will be reported to the GPC Environment Manager, and the appropriate regulatory agency (e.g. DAWR, DES, MSQ) • Where Category 1 or Category 2 restricted matter (as defined under the Biosecurity Act) is detected (including Red imported fire ant), Biosecurity Queensland will be contacted within 24 hours of its detection • Gladstone Regional Council is required to be notified in the event that a Category 2 restricted matter (as defined by the *Biosecurity Act 2014*) is detected, enabling them the opportunity to investigate the matter, and respond as per their Biosecurity Plan, if required.			

Reporting	• All complaints or incidents that are received by the contractor should be reported to the GPC Environment Manager as outlined in Section 6.14 of this Project EMP • All records and associated permits will be provided to the relevant authority upon request and/or at the completion of Project activities. • Regular internal and external third party audits will be conducted for the duration of the construction, to ensure that: – Mitigation measures are being implemented effectively – Relevant performance criteria is being achieved – Activities are compliant with regulatory and project-specific requirements – Any non-conformances are recorded and appropriate corrective actions are implemented.
Corrective action/s	• In the event that pest or weed infestations are detected during the pre-construction phase, the actions below will be implemented: – Infested areas are to be fenced off to prevent further spread of pests and/or weeds – Liaison and collaboration with DAF, Biosecurity Queensland and Gladstone Regional Council will occur, where required, to identify and implement appropriate actions to the pest/weed infestation – An appropriate weed and/or pest management strategy will be used/implemented to treat the infestation by persons with a Commercial Operators Licence (ground distribution of herbicides) – The cause of the pest and/or weed introduction/proliferation will be investigated, and mitigation measures will be revised, if required, to prevent a re-occurrence – Continual monitoring of the infested area will occur until the infestation is controlled. • GPC to review this Project EMP as per Section 6.18.

8.8 Noise and vibration management plan

Project activities include the use of powered equipment operating at variable hours throughout the course of construction and maintenance activities and the installation of new navigational aids. This has the potential to create noise and vibration impacts on the surrounding environment, including terrestrial noise and vibration and underwater noise impacts.

As a minimum, the controls below will be implemented to manage potential noise and vibration impacts.

<table>
<tr><td>Objectives</td><td colspan="4">• To prevent adverse terrestrial noise and vibration and underwater noise impacts at sensitive receptors.
• Compliance with conditions of approval and this Project EMP.</td></tr>
<tr><td>Potential impacts</td><td colspan="4">Refer to Appendix E</td></tr>
<tr><td rowspan="2">Actions</td><td rowspan="2">Actions</td><td colspan="3">Project activity</td></tr>
<tr><td>WBE and BUF construction</td><td>WB and WBE maintenance</td><td>Navigational aids</td></tr>
<tr><td></td><td>• General noise management controls are to be adopted and adhered to for the duration of the construction phase, particularly for all works outside the standard day time hours of construction (6.30am to 6.30pm Monday to Saturday). These include:
– Brief the Project work team to raise awareness of migratory shorebirds and the importance of minimising noise emissions
– Use mobile plant with efficient acoustic mufflers on the exhausts
– Where practical, adjust reversing alarms on plant to limit the acoustic range to the immediate operational area
– Selection of the quietest plant and equipment that can economically undertake the work
– Regular maintenance of equipment to ensure that it remains in good working order
– Where practical, avoid the coincidence of plant and equipment working simultaneously close together near sensitive receivers
– Mobile plant such as excavators, front end loader and other diesel-powered equipment are to be fitted with residential class mufflers</td><td>✓</td><td>✓</td><td>✓</td></tr>
</table>

	– Where work is proposed within at least 1km of residences, the community should be notified at least 2 weeks prior to the commencement of works. Notifications will describe the potential noise and vibration levels and the proposed management measures to control environmental impacts. – Broadband reversing alarms are to be used instead of tonal reversing alarms where sensitive receptors are within 1km of proposed construction works. This will be a requirement when outside standard working hours and included as a contractual requirement for contractors. – Equipment which is used intermittently is to be shut down when not in use and all engine covers are to be kept closed while equipment is operating – During site inductions and toolbox talks, all site workers (including subcontractors and temporary workforce) are to be made aware of the hours of construction and how to apply practical, feasible and reasonable measures to minimise noise and vibration when undertaking construction activities – The site manager (as appropriate) will provide a community liaison phone number and permanent site contact so that noise and/or vibration-related complaints, if any, can be received and addressed in a timely manner. Consultation and cooperation between the site(s) and neighbours to the site(s) would assist in limiting uncertainty, misconceptions and adverse reactions to noise and vibration.			
	• Mobile plant such as excavators, front end loader and other diesel-powered equipment to be fitted with residential class mufflers	✓	✓	
	• Where practical, avoid the coincidence of plant and equipment working simultaneously close together near sensitive receivers.	✓	✓	
	• Broadband reversing alarms are to be used instead of tonal reversing alarms where sensitive receptors are within 1km of proposed construction works. In particular, this will be a requirement when outside standard working hours and included as a contractual requirement for contractors	✓	✓	
	• Where work is proposed within at least 1km of residences, the community should be notified at least 2 weeks prior to the commencement of works. Notifications will describe the potential noise and vibration levels and the proposed management measures to control environmental impacts	✓	✓	✓

<table>
<tr><td></td><td>

- The site manager (as appropriate) will provide a community liaison phone number and permanent site contact so that noise and/or vibration related complaints, if any, can be received and addressed in a timely manner. Consultation and cooperation between the site(s) and neighbours to the site(s) would assist in limiting uncertainty, misconceptions and adverse reactions to noise and vibration

</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td></td><td>

- All equipment will be turned off when not in use

</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td></td><td>

- All proposed Project safety zones are to be implemented to mitigate impact pilling.

Proposed safety zones for continuous impact piling durations

<table>
<tr><td colspan="2">Noise exposure threshold based on cumulative SEL (within a 24 hour period)</td><td>Observation zone</td><td>Shut-down zone</td></tr>
<tr><td>Duration with continuous piling @ 100 strikes/min</td><td>Cumulative SEL (< 198dB re 1µPa²·S)</td><td></td><td></td></tr>
<tr><td>≤ 1 min</td><td>≤ 50m</td><td>1.0km</td><td>50m</td></tr>
<tr><td>10 min</td><td>310m</td><td>1.0km</td><td>310m</td></tr>
<tr><td>60 min</td><td>1.4km</td><td>2.0km</td><td>1.4km</td></tr>
</table>

</td><td>✓</td><td></td><td>✓</td></tr>
<tr><td></td><td>

- Implementation of additional standard management and mitigation measures to reduce impact pilling is to occur. These include:
  - Contract documentation – include these requirements for piling noise management and mitigation measures in the contract documentation
  - Timing and duration – avoid conducting impact piling during times when marine mammals are likely to be breeding, calving, feeding or resting in biologically important habitats nearby. Where practical, avoid piling during whale migration season.
  - Trained crew – ensure a suitably qualified person is available during piling to conduct the recommended standard operational procedures to manage noise impacts

</td><td>✓</td><td></td><td>✓</td></tr>
</table>

	– Standard operational procedures – standard operating procedures to be undertaken by contractors during piling activities include pre-start, soft start, normal operation, stand-by operation, and shut-down procedures, including:
	  – Pre-start monitoring – the presence of marine turtles and marine mammals will be visually monitored by a suitably trained crew member for at least 30 minutes before piling commences using a soft start procedure
	  – Soft start – if marine turtles and marine mammals have not been observed inside the shut-down zone during the pre-start observations, soft start may commence with piling impact energy gradually increased over a 10 minute time period. A soft start will also be used after long breaks of more than 30 minutes in piling activity
	  – Normal piling – if marine turtles and marine mammals have not been observed inside the shut-down or observation zones during the soft start, piling at full impact energy may commence. Visual observations will continue throughout the piling activities
	  – Stand-by – if marine turtles or marine mammals are sighted within the observation zone during the soft start or normal operation piling, the operator of the piling rig will be placed on stand-by to shut down the piling rig, while visual monitoring of the animal continues
	  – Shut-down – if marine turtle or marine mammals are sighted within or are about to enter the shut-down zone, piling activity should be stopped immediately. If the animal is observed to move outside the zone again, or 30 minutes have elapsed with no further sightings, piling activities will recommence following the soft start procedure. If a marine turtle or marine mammal is detected in the shut-down zone during a period of poor visibility, operations will stop until visibility improves.			

	• Use of piling noise attenuation measures. Various attenuation measures have been developed to attenuate underwater piling noise to minimise exposure of marine fauna species during piling activities (ICF Jones & Stokes and Illingworth & Rodkin 2009). These measures include but not limited to: – Air bubble curtains. Air bubble curtains are designed to infuse the water column surrounding the pile with air bubbles, generating a bubble screen that attenuate the sound propagation from the pile. For a mid-sized steel pile as used in this Project (with a dimension greater than 24 inches but less than 48 inches), the previous experiment data indicates that an air bubble curtain will provide about 10 dB of noise reduction (ICF Jones & Stokes and Illingworth & Rodkin 2009) – Isolation casings. Isolation casings are hollow casing slightly larger in diameter than the pile to be driven. The casing is inserted into the water column and bottom substrate, and then dewatered so that the work area could be isolated from the surrounding water column in order to attenuate the sound propagation. Dewatered isolation casings generally can be expected to provide attenuation that is at least as great as the attenuation provided by air bubble curtains. – Cushion blocks. Cushion blocks consist of blocks of material atop a pile during piling to minimise the noise generated during impact hammering. Materials typically used for cushion blocks include wood, nylon and micarta blocks. The resulted noise reduction could be from a few dB to over 20 dB. This measure can be used in conjunction with air bubble curtains or isolated casings as above.	✓		✓
	• Key personnel will be provided mandatory training in the potential Project noise and vibration impacts and mitigation measures to be implemented	✓	✓	✓
Performance indicators	• No noise complaints or related incidents associated with the Project activities • No exceedances of *Environmental Protection (Noise) Policy 2007* criteria.			

Monitoring

- All noise generated during the Project is to be monitored, documented and managed in accordance with the Noise and Vibration Management Plan (NVMP) that has been prepared as part of the Project EMP. The NVMP requires the following actions:
  - Monitor construction noise levels at the commencement of the construction phase to verify the outcomes of the noise assessment and confirm the noise from the Project activities will not cause unacceptable impacts at sensitive receptors
  - Implement a rolling spot check regime of noise intensive plants and equipment
  - Undertaken all monitoring in accordance with relevant Australian Standards and regulatory guidelines for the measurement of environmental noise
  - Conduct supplementary noise and/or vibration monitoring, as warranted, to identify issues of concern in response to any noise complaints.
- Audits are conducted by GPC as per Section 6.11 of this Project EMP.
- Spot checks of noise intensive plant and equipment by GPC as per Section 6.9 of this Project EMP
- Noise spot checks should be conducted at nearby shorebird roosts during construction (ie Friend Point shorebird roost) and compared to the following guidelines for migratory shorebirds. Works should cease and mitigation measures developed as appropriate where noise spot checks determine that 'moderate impacts on habitat use', or 'avoidance of area' disturbance is likely to occur.

Disturbance effect	Steady or continuous noise sources (LA_{eq}(15min)(dBA)	Episodic (single event or short-term) noise sources LA_{max} (dBA)	Typical bird activities potentially impacted
Occasional (Alert) – minor impacts on habitat use for most species	50 to 65	45 to 60	Nesting
Frequent (Alarm or Flight) – moderate impacts on habitat use	65 to 85	60 to 80	Nesting Roosting
Avoidance of area – by most of the population of some species	≥ 85	≥80	Nesting Roosting Foraging

Table notes:

- Masking impacts, particularly on smaller songbirds, may occur at noise levels of approximately the alert threshold right up until the point of avoidance
- LA_{max} limits have been specifically set below the LA_{eq} limits in recognition of considerations related to startle response

Reporting	• GPC will maintain records of all inspections in accordance with Section 6.11 of this Project EMP • Compliance and sighting report – the contractor will maintain a record of procedures employed during piling, including information on any marine mammals or marine turtles sighted, and their reaction to the piling activity. The report will include – Location, date, start and completion time of piling – Information on the piling rig (hammer weight and drop height), pile size, number of piles, number of impacts per pile – Details of the trained crew members conducting the visual observations – Times when observations were hampered by poor visibility or high winds, times when start-up delays or shut-down procedures occurred, and the time and distance of any marine mammal or marine turtle sightings. • All complaints or incidents that are received by the contractor should be reported to GPC. GPC will report these as per Section 6.14 of this Project EMP. • All records required by this plan and associated permits must be provided by the contractor to GPC upon request and/or at the completion of Project activities.
Corrective action/s	• The contractor will schedule maintenance and/or corrective actions as required for equipment issues • In consultation with GPC, the contractor will identify cause of any incident or nuisance, and institute preventative actions to prevent a re-occurrence • GPC to review this Project EMP as per Section 6.18.

8.9 Waste management

The waste expected to be produced during Project activities includes municipal, quarantine waste, sewage/greywater as well as waste fuel, oils and lubricants. The bund wall material will be sourced from a commercial quarry and solid waste generated from the quarry will be managed under a separate waste management plan, and is therefore not considered part of this Project.

As a minimum, the controls below will be implemented to manage potential risk of pollution of the environment from waste generated by the Project.

<table>
<tr><td>Objectives</td><td colspan="4">• Minimise the amount of waste generated by the Project
• Ensure no waste is released into the environment
• Ensure best practice management is adopted for the handling and storage of all waste materials
• Manage wastes and spills to prevent environmental harm
• Compliance with permit conditions, regulations and management plans.
• Ensure all waste material is appropriately managed and disposed.</td></tr>
<tr><td>Potential impacts</td><td colspan="4">Refer to Appendix E</td></tr>
<tr><td rowspan="2">Actions</td><td rowspan="2">Actions</td><td colspan="3">Project activity</td></tr>
<tr><td>WBE and BUF construction</td><td>WB and WBE maintenance</td><td>Navigational aids</td></tr>
<tr><td></td><td>• Prior to construction commencement a Waste Management Plan (WMP) will be prepared, using Project-specific detail relating to construction and maintenance activities, to establish suitable waste management requirements.</td><td>✓</td><td></td><td></td></tr>
</table>

	• The WMP will include (but not be limited to) the following information: – An inventory of solid, liquid (including wastewater and sewerage) and gaseous wastes to be generated (on land and at sea) during the construction and operational phases of the Project – Waste management processes and their associated waste systems (i.e. waste outputs: solid, liquid and gaseous), including opportunities for waste avoidance, reuse and recycling, as well as treatment and disposal efforts, during construction and operational phases – Procedures for waste avoidance, reuse, recycling, treatment and disposal, with regard to best practice waste management strategies – Procedures for collection, handling, transport of waste material – Information on the variability, composition and generation rates of waste produced – Natural resource use efficiency (e.g. energy and water), integrated processing design, co-generation of power and by-product reuse – Proposed location, site suitability, dimensions and volume of any solid waste disposal facility, including its method of construction – Origin, quality, volume and chemical analysis of wastewater, and any immiscible liquid waste originating from the Project – Market demand for recyclable waste, where practicable	✓		
	• The WMP will include hazardous and potentially hazardous waste management measures, including: – Maintain inventory and safety data sheets for hazardous substances – Tracking records to be kept when regulated waste is removed from the dredger or a GPC wharf facility. All regulated waste transported by licenced contractors and disposed at a licenced place. – Bring only the minimum quantity of substance required – Store full and empty drums and/or containers in bunded areas – Collect empty drums for re-use or recycling – Waste not disposed of by burning – Hazardous substances handled and stored in a manner that prevents environmental harm – Any spills to be cleaned up as soon as practicable – Call emergency services to assist with hazardous material spills – Complaints or incidents to be reported to GPC.	✓	✓	✓

	• The WMP will include sewage/grey water waste management measures, including: – Waste water from dredger and ablution facilities to be collected then transported to GRC sewage treatment plant – With the help of a licenced contractor determine the number of ablution facilities required at the site offices for the duration of the Project – Dredgers with tertiary treatment facilities will treat generated waste water on board.	✓	✓	✓
	• The WMP will include municipal and office waste management measures, including: – Provide facilities for the appropriate separation and storage of waste. Adequate storage capacity to be maintained and no waste to remain at the completion of works – Ensure that waste is removed and disposed of by a licenced contractor on a regular basis to a licenced waste facility – Educate staff to recycle waste – All waste areas will be kept tidy and all municipal waste is to be placed in the appropriate receptacle – Use sealed bins to prevent wind, animals and rain from spreading litter – Waste is not to be disposed of in the marine environment or incinerated in vessels at sea – Ensure that bins/bags used on the dredgers to store waste are secure – Retrieve litter that does enter the water.	✓	✓	✓
	• The WMP will include general building waste management measures, including: – Store waste separately to avoid contamination with other waste – Where possible reuse excess materials on site alternatively remove to recycling facility.	✓	✓	✓
	• During the pre-construction phase, suitable material storage arrangements will be determined to minimise damage from weather or machinery, eliminating the need for the purchase of replacement materials, and unnecessary waste generation	✓		
	• Green waste generated during construction and operational management of the WB and WBE reclamation areas (i.e. vegetation cleared for construction and operational management, including grass clippings and other green waste) will be used for landscaping and site stabilisation within the WB and WBE reclamation areas.	✓		
	• Waste produced by vessels will be managed via contractual arrangements with GPC, and will meet requirements of the GPC EMS as well as the relevant waste management legislation and guidelines.			✓

	• Where practicable, suppliers will be instructed to avoid the use of excessive packaging, and be requested to take back packaging and unused materials (e.g. pallets)	✓	✓	✓
	• Where practicable, prefabrication of construction components off-site will be encouraged to avoid waste generation within the Project direct impact area.	✓	✓	✓
	• Solid waste will be temporarily stored onsite, in accordance with the relevant legislation and guidelines, and regularly collected by a licenced waste disposal contractor and, where recycling is not feasible, transferred to a licenced waste facility within the GRC area (e.g. Benaraby Landfill).	✓	✓	
	• All waste areas will be kept tidy and all municipal waste is to be placed in the appropriate receptacle. Sealed bins will be used to prevent wind, animals and rain from spreading litter.	✓		
	• Regulated wastes will be contained and controlled in a manner that prevents environmental harm	✓	✓	✓
	• Absorbent material used to clean up hydrocarbon spills will be stored in an appropriate container marked 'regulated waste'	✓	✓	
	• All bunding will be appropriately sized for the application and capacity maintained (e.g. kept free of rain water)	✓	✓	
	• Appropriate waste disposal facilities will be present on-site throughout construction to maintain segregation and maximise economic reuse and recycling, and	✓	✓	
	• Food scraps will be removed from the Project impact area daily	✓	✓	
	• All sewage and greywater, generated as a result of the operation of the reclamation area construction compound and site office, will be temporarily stored onsite in accordance with the relevant waste management legislation and guidelines, and removed and transported to the GRC sewage treatment plant.	✓		
	• In the event of an oil or fuel spill into marine and/or terrestrial environments, vessels will adhere to the requirements of the spill-clean procedure included in the DTMR Guide for the prevention of ship-sourced pollution and for the safe transfer of bunkers in Queensland waters, 2016. An Environmental Incident Report and Corrective Action Report will be completed within 24 hours of the incident occurring as per the requirements set out in the Project EMP.	✓	✓	✓
	• Responsibilities will be assigned and communicated regularly throughout construction (e.g. toolbox presentation, signage etc.)	✓	✓	✓
	• To prevent unnecessary waste, materials will be purchased cut-to-size, where practicable	✓	✓	✓

	• No waste, other than reclamation decant water, is to be released into the marine environment or adjacent vegetation communities.	✓	✓	✓
	• Refuelling of heavy vehicles hauling material for the construction of the WBE reclamation area will not occur at the WBE reclamation area	✓	✓	
	• No refuelling will occur within 50m of a watercourse or the Port	✓	✓	
	• No major maintenance work to plant or machinery will occur at the WBE reclamation area. Minor maintenance of plant or machinery conducted at the WBE reclamation area will be conducted on a bunded cement pad appropriately sized for the application	✓	✓	
	• Refuelling at the WBE reclamation area for plant located onsite will occur by mobile fuel truck in a bunded area appropriately sized for the application	✓	✓	
	• Key personnel will be provided mandatory training in the potential Project waste impacts and mitigation measures to be implemented	✓	✓	✓
	• Temporary storage of hydrocarbons will occur in bunded areas that are appropriately sized for the application and capacity maintained (i.e. kept free of rain water)	✓	✓	
Performance indicators	• No incidents or complaints will be received regarding waste generated by the Project causing environmental harm or nuisance • Ecological integrity of the surrounding environments will be maintained • All waste materials will be handled and stored in a safe and appropriate manner • There is no environmental impact on, and disturbance to, the adjoining terrestrial and/or marine areas from waste • Correct storage, transport and disposal of waste products, including tracking for regulated wastes.			
Monitoring	• The works areas and associated access areas may be inspected by GPC as per Section 6.9 of this Project EMP to assess the effectiveness of control strategies • Audits are conducted by GPC as per Section 6.11.			
Reporting	• Records must be kept by the contractor when regulated waste is removed from site as per Section 6.16 of this Project EMP • In the event of a waste management incident, an Environmental Incident Report and Corrective Action Report will be compiled, and forwarded on to the relevant authority • All complaints or incidents that are received by the contractor will be reported to GPC. GPC will report these as per 6.14 of this Project EMP • All records required by this Project EMP and associated permits must be provided by the contractor to GPC upon request and/or at the completion of construction activities. GPC may be requested to provide the contractor's waste tracking certificates to DES.			

Corrective action/s	• In consultation with GPC, the contractor will identify cause of any incident or nuisance, and institute preventative actions to prevent a re-occurrence • The contractor must dispose of contaminants (including clean up material) from hydrocarbon and hazardous chemical spills as Regulated wastes • GPC to review this Project EMP as per Section 6.18.

8.10 Water quality management plan (including erosion and sediment control)

Construction of the WBE reclamation area, installation of new navigational aids and maintenance activities on the WBE reclamation area have the potential to impact on water quality in the Port of Gladstone, however appropriate management controls will be in place to ensure that these potential impacts do not affect sensitive receptors.

Dredging associated with the Project is likely to have the largest potential impacts to water quality, however potential impacts from other construction activities need to be appropriately managed in order to ensure any impacts are avoided, minimised or mitigated

As a minimum, the controls below will be implemented to manage the potential impacts to water quality as a result of Project activities.

Objectives	• Protect nearby sensitive receptors from excess turbidity caused by construction activities • Achieve the water quality objectives outlined in the Procedure.			
Potential impacts	Refer to Appendix E			
Actions	**Actions**	**Project activity**		
		WBE and BUF construction	**WB and WBE maintenance**	**Navigational aids**
	• Implement the Environmental Monitoring Procedure (refer Appendix A)	✓	✓	
	• Preparation of an erosion and sediment control plan by a suitably qualified and experienced professional in accordance with the requirements of the International Erosion Control Association Guidelines (2008).	✓		
	• The rock obtained from the Targinnie/Yarwun quarry area for the construction of the bund walls will be screened at the quarry site to remove the fine fraction (< 20mm) to reduce the likelihood of turbid plumes from the introduction of fines into Port Curtis.	✓		

	• Construction of the bund walls is to include: - All reasonable and practicable measures will be implemented to prevent pollution resulting from silt runoff, oil and grease spills from machinery, concrete truck washout and the like - No refuelling or maintenance of construction equipment will occur on the site, nor will equipment be parked at the site for a significant time, reducing the potential for significant spills of oils and fuels to occur - No waste, other than reclamation decant water, is to be released into the marine environment or adjacent vegetation communities - Spill kits for land and water based spills (including hydrocarbon absorbent booms) will be kept at the site and personnel trained in their use. Emergency response procedures will be established. - Adherence to waste management controls identified in the Project EMP - Monitoring and management of any material that is displaced above LAT will be undertake in accordance with the ASSMP - All construction equipment will undergo regular maintenance and pre-start inspections. Equipment and vehicles will not be parked at the site for a significant time - Powered Mobile Equipment (PME) will be suitable and rated for the task and kept in good working order - A PME preventative maintenance regime will be implemented.	✓		
	• Key construction personnel will be provided mandatory training in the potential Project water quality impacts, sensitive receptors, and mitigation measures to be implemented, including the timing of the implementation of such measures	✓	✓	✓
	• Design specifications will avoid disturbance of marine and terrestrial surface and subsurface soils, where practical. Where disturbance is unavoidable, the design specification will endeavour to minimise the disturbance footprint	✓		
	• Additional geotechnical investigation will be undertaken during the detailed design phase of the reclamation area, to identify paleo channels. If paleo channels are found to occur in the reclamation area, appropriate design and construction methodologies will be implemented to minimise the potential for piping under the bund walls and mud wave erosion on the outside of the wall	✓		
	• Reclamation bund walls will be constructed over a 3 year timeframe to assist in minimising potential piping impacts through the bund walls	✓		

	• The internal dewatering cells will be designed to ensure the surface area and volume is large enough, and the detention time is sufficient to meet the required decant water quality licenced discharge limits	✓		
	• Where practicable, works will be staged to minimise sediment disturbance and migration within the marine environment, such sediment plume generation during periods of high ebb flows	✓		
	• Erosion and sediment control devices installed within the WBE reclamation area will be in compliance with design concepts outlined in the Best Practice Erosion and Sediment Control Guideline (IECA 2008). Installation and maintenance measures will include: – Sediment fencing will be installed where appropriate and above HAT – Water will be used for dust suppression where appropriate – Vehicles and machinery will be used at the appropriate speeds – Access tracks will be set back from major flow paths to help prevent erosion – Soil stockpile will not be placed within 50m of the marine environment during construction – Surface water diversion systems will be installed upslope of cleared areas, and stockpiles – Sediment fences will be constructed down slope of all stockpiles, and no further than two metres down slope of all areas to be cleared on slopes, and adjacent to watercourses – Continual monitoring and maintenance of surface water diversion structures and erosion control measures will be conducted during construction activities – Minimise exposed area through progressive clearing – Surface of disturbed ground to be stabilised as soon as practicable (e.g. by geotextile and/or vegetation) to avoid erosion and transport of sediments – Sediment fences will be inspected weekly for UV degradation, effectiveness and capacity and will not be removed until disturbed areas have been stabilised – Sediment removed from sediment fences will be stockpiled and used during rehabilitation and revegetation practices – Erosion and sediment controls will be inspected weekly and immediately following any rainfall events	✓	✓	
	• Prior to construction, a cyclone management plan will be prepared in consultation with the relevant authorities	✓		
	• A stockpile of armour material will be held at the quarry, sufficient to cover any exposed core material if a cyclone were to approach Gladstone	✓		

	• Geotextile material will be placed against the inner face of the seaward bund wall, at all placement areas, to minimise the migration of dredged material fines through the bund wall to the marine environment. The geotextile liner material type, placement and restraint method will be specified in the detailed design phase of the reclamation bund wall and will meet industry best practice and/or recognised industry standards (refer Section 7.6.4).	✓		
	• Armour material will be established over the core material as soon as practicable after dumping to prevent the loss of core material within the marine environment. The entire bund wall will be protected by armour material within 28 days of bund wall completion	✓		
	• No greater than 100m of unprotected core material along the bund wall will be exposed at any given time during construction	✓		
	• Progressive installation of stormwater management measures will occur on the final reclamation surface as it is completed		✓	
	• Where practicable, undertake progressive stabilisation of areas that are no longer needed for on-going operations (e.g. construction compound), throughout construction.		✓	
	• At the completion of filling of the WBE reclamation area, a large stormwater pond in each reclamation area will be retained to manage dust and stormwater quality runoff from the final surface	✓	✓	
	• WBE reclamation area surface stabilisation works will include capping the final surface with an appropriate grade and revegetation of the reclamation surface		✓	
	• Prepare and implement a site management plan (ground stability) for the WBE reclamation area		✓	
	• All maintenance, servicing and re-fuelling of vehicles and equipment will be undertaken offsite	✓	✓	
	• Daily inspections of all plant and machinery will be conducted	✓		
	• Spill kits will be provided at the site, near where equipment is being used, and staff will be trained in the use of spill kits.	✓	✓	
	• If a spill occurs, this will be cleaned up immediately with appropriately absorbent materials with the area remediated if required	✓	✓	
	• Store oils, fuels, chemicals and hazardous materials in clearly designated and appropriating bunded storage areas, as far as practicable from marine waters. Cover the storage areas to prevent stormwater infiltration.	✓		

Performance indicators	• No exceedance of seagrass light thresholds outlined in the Environmental Monitoring Procedure (refer Appendix A) • Limited changes to visual inspections of turbidity plumes adjacent to the bund wall during works • No decline in seagrass community health within Port Curtis as a result of bund wall construction works
Monitoring	• Groundwater monitoring in accordance with the ASSMP • Background and construction turbidity monitoring in accordance with the Environmental Monitoring Procedure (refer Appendix A) • Erosion and sediment controls will be inspected weekly and immediately following any rainfall events • Monthly audits of the ESCP to be conducted by a CPESC
Reporting	• GPC will maintain records of all inspections in accordance with Section 6.16 of this Project EMP • All complaints or incidents that are received by the contractor should be reported to GPC. GPC will report these as per Section 6.14 • All records required by this plan and associated permits must be provided by the contractor to GPC upon request and/or at the completion of Project activities
Corrective action/s	• The contingency procedure within the Environmental Monitoring Procedure (refer Appendix A) will be implemented during bund wall construction works. • All non-conformances will be corrected and reported to the GPC Environment Manager in accordance with Section 6.14 of this Project EMP • The cause of the incident will be investigated, and mitigation measures will be revised, if required, to prevent a re-occurrence • GPC to review this this Project EMP as per Section 6.18.

9. More information

This Plan will be available to all employees, contractors and consultants to which it applies.

This document is uncontrolled when printed.

If you require any further information, please contact the document Facilitator, listed on the cover page.

10. References

Commonwealth of Australia 2009, *National Assessment Guidelines for Dredging 2009,* Canberra, 2009.

Appendix A – Project Environmental Monitoring Procedure

Refer to the Project EIS (Appendix Q3)

Appendix B – Environmental Values

Priority port master planning is a commitment in the *Reef 2050: Long Term Sustainability Plan* (Reef 2050) to ensure that the outstanding universal values (OUV) of the Great Barrier Reef World Heritage Area (GBRWHA) are an intrinsic consideration in the future port development, management and governance.

Table B-1 summarises the locally expressed (OUV) attributes within the Port of Gladstone and surrounding areas, and their contribution classifications relative to the overall OUV of the (GBRWHA). Table B-1 also includes a summary of the environmental values determined to be key contributors to the local expression of the attributes of the OUV of the GBRWHA (i.e. key environmental values). Other environmental values are recognised as locally contributing to the overall OUV of the GBRWHA.

Section 8 of this Project EMP will be implemented in order to ensure that activities associated with the Project do not negatively impact on the identified sensitive receptors, including Matters of National Environmental Significance (MNES). Mapping of the key environmental values outlined in Table B-1 will be included in the Project EMP following EIS approval.

Table B-1 Matters of National Environmental Significance relevant to Port Curtis

Category	Local attribute	Relevant OUV criteria and contribution classifications[1]				Summary of the key environmental values
		vii[2]	viii[3]	ix[4]	x[5]	
Coral reefs	Fringing reefs	**Min**	**Min**	**Min**	**Min**	Fringing coral reefs
	Inshore turbid reefs	-	**Min**	**Min**	**Min**	Inshore turbid coral reefs
	Coral species diversity and extent	**Min**	**Min**	**Min**	**Min**	Various coral species
Marine water quality	Marine water quality	-	-	**Mod**	**Mod**	Marine water quality
Fish	Fish species and diversity	**Min**	-	**Min**	**Min**	Colosseum Inlet Fish Habitat Area Calliope River Fish Habitat Area Coral reefs, seagrass meadows, mangrove communities, hard and soft benthic substrates, beach habitats, estuaries, creeks and rivers
Marine megafauna	Dugong	-	-	-	**Mod**	Dugong species Seagrass meadows
	Species of whales	-	-	-	**Min**	Minke whales Sperm whales Humpback whales
	Migrating whales	**Min**	-	-	-	Humpback whales and calving habitat
	Species of dolphins	**Min**	-	-	**Sig**	Australian humpback dolphins
Marine turtles	Breeding colonies of marine turtles	**Mod**	-	-	**Mod**	Flatback turtle rookery on Curtis Island Nesting beaches on Facing, Curtis and Wild Cattle Islands, Boyne Island Beach and Tannum Sands
	Green turtle breeding	**Min**	-	-	**Min**	
	Marine turtle rookeries	**Mod**	-	-	**Mod**	
	Nesting turtles	**Min**	-	-	-	
Seagrass and macroalgae	Seagrass	**Min**	**Min**	**Mod**	**Mod**	Seagrass meadows
	Beds of *Halimeda* algae	-	-	**Min**	-	Beds of *Halimeda* algae

Category	Local attribute	Relevant OUV criteria and contribution classifications[1]				Summary of the key environmental values
		vii[2]	viii[3]	ix[4]	x[5]	
Shorebirds and migratory seabirds	Seabirds	**Min**	-	**Min**	**Min**	Potential foraging habitat
	Shorebirds and migratory birds	-	-	-	**Sig**	Threatened migratory shorebird species Shorebird habitat and important roost sites (note these vary from year to year)
Flora, fauna and ecological communities	Threatened and endangered flora and fauna species (including threatened ecological communities)	**Min**	-	-	**Mod**	Coastal Saltmarsh Threatened Ecological Community
	Vegetated mountains	**Min**	-	-	-	Mount Larcom landform
	Mangroves	**Min**	**Min**	**Min**	**Min**	Various mangrove species
	Mangrove species diversity	-	-	-	**Min**	Various mangrove species
	Vast mangrove forests	**Mod**	-	-	-	Mangrove sequences at The Narrows
Continental islands	Continental islands and green vegetated islands	**Mod**	**Mod**	-	-	Curtis Island
	Plant species diversity and endemism (species being unique to a defined geographic location)	-	-	-	**Sig**	Curtis Island
	Vegetation of the continental islands	-	-	**Sig**	**Sig**	Curtis Island
Geomorphology	Beaches	**Min**	-	-	-	Curtis Island beaches Facing Island beaches Boyne Island Beach
	Dune systems	**Min**	**Min**	-	-	Parabolic dunes Curtis Island
	River deltas	**Min**	**Min**	**Min**	**Min**	Marine tidal sand deltas (Curtis Island, Boyne River, Colosseum Inlet)
	Connectivity: cross-shelf, longshore and vertical	-	**Min**	**Min**	**Min**	The Narrows tidal passage
Cultural heritage values	Traditional Owner interaction with the natural environment	-	-	**Mod**	-	Indigenous cultural heritage sites and values
Marine fauna	Diversity supporting marine fauna species (global conservation significance)	**Min**	-	**Min**	**Mod**	A diverse range of marine fauna species
Total species diversity	Total species diversity	**Mod**	-	**Mod**	**Mod**	A diverse range of marine, intertidal and terrestrial flora and fauna species

Table notes:

1	Min	Minor
	Mod	Moderate
	Sig	Significant
2	vii	Aesthetic values and superlative natural phenomena
3	viii	Ongoing geological processes
4	ix	Ecological and biological processes
5	x	Biodiversity conservation

Appendix C – Matters of National Environmental Significance

A summary of the MNES located in areas with potential to be impacted by the Project is provided in Table C-1, including the relevant sections of the EPBC Act and where potential impacts are addressed in this Project EMP. The table outlines where controlling provisions under the EPBC Act are not relevant to the Project activities (e.g. nuclear actions).

Table C-1 Matters of national environmental significance and their relevance to the Project

MNES in relation to the Project	Summary of values/species present within the Project impact areas	Relevant figure reference
World Heritage properties (Sections 12 and 15A) and National Heritage places (Sections 15B and 15C)		
The areas to be dredged (including the channel duplication, dredger access channel and the DMTL), location of new navigational aids, and the WBE reclamation area are situated within the boundaries of the Great Barrier Reef World Heritage Area which is both a World Heritage property and a National Heritage place (i.e. Project activities below the LAT within the Port are located within the GBRWHA)	The 2012 *Statement of Outstanding Universal Value for the Great Barrier Reef World Heritage Area* establishes that the GBRWHA meets all four natural heritage criteria of the current Operational Guidelines, all of which are considered to be present within the Port of Gladstone. These are:	Mapping of MNES will be included in this Project EMP following Project EIS approval.
	■ Criterion vii – contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance	
	■ Criterion viii – be outstanding examples representing major stages of earth's history, including the record of life, significant ongoing geological processes in the development of landforms, or significant geomorphic or physiographic features	
	■ Criterion ix – be outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, freshwater, coastal and marine ecosystems and communities of plants and animals	
	■ Criterion x – contain the most important and significant natural habitats for in situ conservation of biological diversity, including those containing threatened species of OUV from the point of view of science or conservation	
Wetlands of international importance (Ramsar wetlands) (Sections 16 and 17B)		
No Ramsar wetlands are located within close proximity to the Project impact areas. Shoalwater and Corio Bay Ramsar wetlands are located approximately 98km to the north of the WBE reclamation area	N/A	

MNES in relation to the Project	Summary of values/species present within the Project impact areas	Relevant figure reference
Nationally threatened species and ecological communities (Sections 18 and 18A)		
Subtropical and Temperate Coastal Saltmarsh Threatened Ecological Community	There will be no direct loss of this TEC as a result of the Project activities, however this TEC is located within the Project indirect impact areas as it is situated approximately 200 to 300 m from the WBE reclamation area	
No threatened flora species were identified during Project EIS field investigations and no species are known to occur within the direct impact areas as identified during previous and Project EIS studies	N/A	
Five marine turtle species are known to occur, or have moderate potential to occur, in the Port Curtis region	■ Flatback turtle (*Natator depressus*) – Vulnerable ■ Green turtle (*Chelonia mydas*) – Vulnerable ■ Loggerhead turtle (*Caretta caretta*) – Endangered ■ Hawksbill turtle (*Eretmochelys imbricata*) – Vulnerable ■ Olive Ridley turtle (*Lepidochelys olivacea*) – Endangered	
Twenty species of marine megafauna are known to occur or predicted to occur in the Port Curtis region	■ Eight whales are known or predicted to occur in the Port Curtis region ■ Ten dolphin species are known or predicted to occur in the Port Curtis region and in adjoining waterways ■ Dugong are known from the Port Curtis region	
Eight species of threatened migratory shorebirds are known from the Project area	■ Bar-tailed godwit (*Limosa lapponica baueri*) - Vulnerable ■ Curlew sandpiper (*Calidris ferruginea*) – Critically endangered ■ Eastern curlew (*Numenius madagascariensis*) – Critically endangered ■ Great knot (*Calidris tenuirostris*) – Critically endangered ■ Northern Siberian bar-tailed godwit (*Limosa lapponica menzbieri*) – Critically endangered ■ Red knot (*Calidris canutus*) – Endangered ■ Greater sand plover (*Charadrius leschenaultia)* – Vulnerable ■ Lesser sand plover (*Charadrius mongolus)* – Endangered	
Ten threatened pelagic bird species have a moderate potential to occur within the Project impact areas	■ Three species of petrel ■ Seven species of albatross	
It is highly likely that habitat for three intertidal and terrestrial fauna species occurs within the Project impact areas	■ Coastal sheath-tail bat (*Taphozous australis*) ■ Koala (P*hascolarctos cinereus*) – Vulnerable ■ Water mouse (*Xeromys myoides*) – Vulnerable	

MNES in relation to the Project	Summary of values/species present within the Project impact areas	Relevant figure reference
Migratory species (Sections 20 and 20A)		
Eight migratory marine fish species are known from the Project impact areas	■ Five shark species ■ Two manta ray species ■ Green sawfish (*Pristis zijsron*) - Vulnerable	
Six migratory reptiles are known to occur or have a moderate likelihood of occurring within the Project impact areas	■ Five marine turtles	
	■ Estuarine crocodiles (*Crocodylus porosus*)	
Ten migratory megafauna species are known or predicted to occur in the Project impact areas	■ Six migratory whales ■ Three migratory dolphin species ■ Dugong	
Sixty migratory bird species are confirmed or have a moderate likelihood of occurring in the Project impact areas	■ Sixty migratory bird species are confirmed or have a moderate likelihood of occurrence within in the Project impact areas ■ Including populations which have exceeded approximately 0.1% of the flyway population on at least one occasion for the following species: – Eastern curlew (*Numenius madagascariensis*) – Grey-tailed tattler (*Tringa brevipes*) – Terek sandpiper (*Xenus cinereus*) – Lesser sand plover (*Charadrius mongolus*) – Ruddy turnstone (*Arenaria interpres*)	
Commonwealth marine areas (Sections 23 and 24A)		
Commonwealth marine areas include any part of the sea, including the waters, seabed and airspace, within Australia's exclusive economic zone and/or over the continental shelf of Australia. Commonwealth marine areas stretch from 3 to 200 nautical miles from the coast The Project impact areas are not located within Commonwealth marine areas, with the nearest Commonwealth marine areas situated more than 9km from the area to be dredged and the new navigational aids	N/A	N/A

MNES in relation to the Project	Summary of values/species present within the Project impact areas	Relevant figure reference
Great Barrier Reef Marine Park (Sections 24B and 24C)		
The GBRMP boundary is situated on the open coastal waters side of Curtis and Facing Islands, with the closest Project impact area located more than 2km southwest of the boundary (i.e. the areas to be dredged, near the southern end of Facing Island)	▪ Coral reefs	
	▪ Fish and other nekton	
	▪ Marine turtles	
	▪ Other marine reptiles	
	▪ Megafauna	
Nuclear actions (including uranium mining) (Sections 21 and 22A)		
Not relevant to the Project	N/A	N/A
A water resource, in relation to coal seam gas development and large coal mining development (Sections 24D and 24E)		
Not relevant to the Project	N/A	N/A

Appendix D – MSQ First Strike Oil Spill Response Plan

Port of Gladstone

First-strike Oil Spill Response Plan

A supplement to the Queensland Coastal Contingency Action Plan

Document control sheet

Prepared by	Maritime Services Branch
Division	Maritime Safety Queensland
Location	Floor 6, Transport House, 230 Brunswick Street, Fortitude Valley, Brisbane 4006
Version no.	4.1
Revision date	February 2014
Status	Final
File Number	225/00028

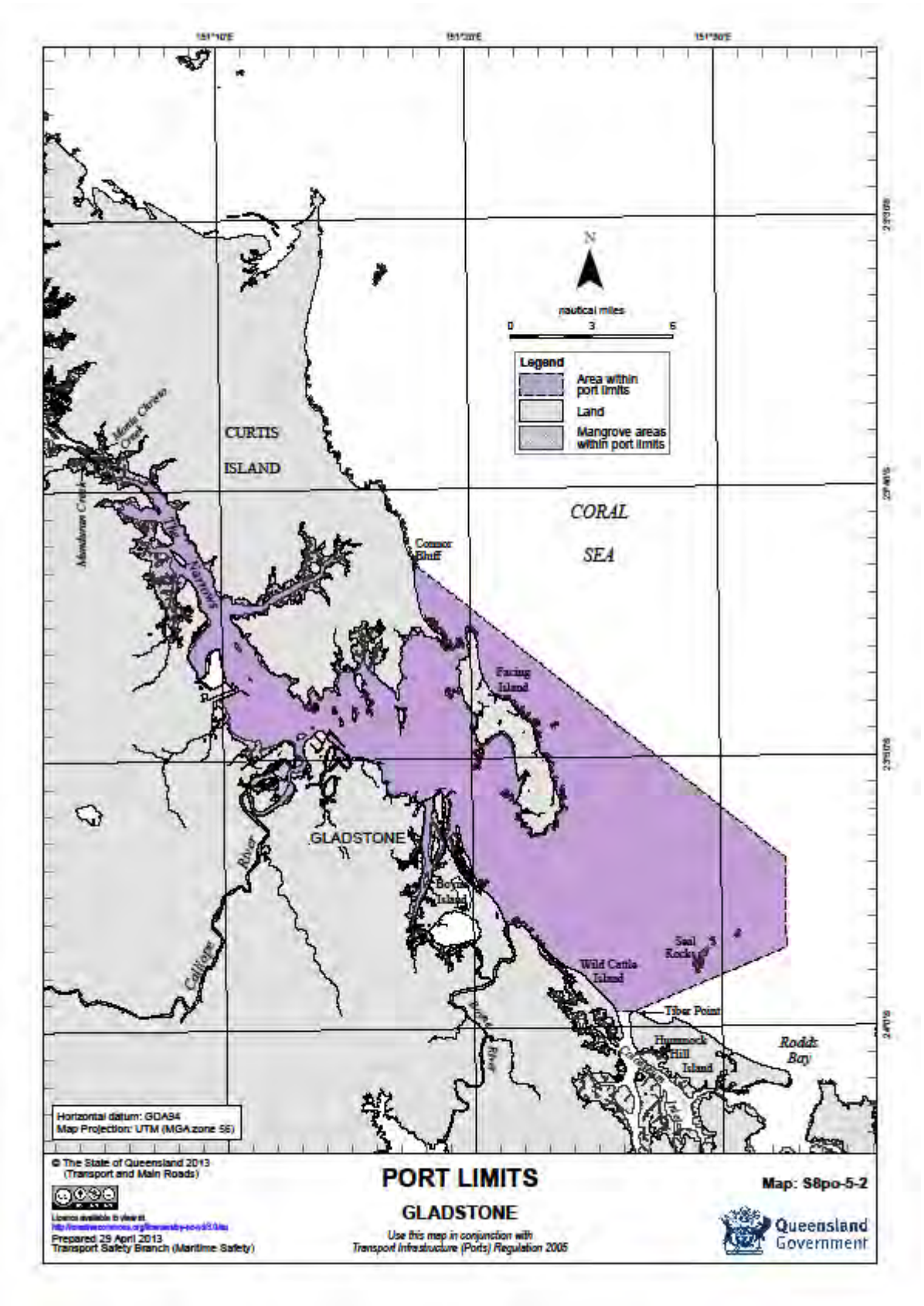
Document sign-off

Version 1 of this document was approved by the Chair of the Queensland National Plan State Committee in July 2006. Subsequent amendments have been of an administrative nature only and have not changed the intent of the document.

Contact for enquiries and proposed changes

If you have any questions or suggested improvements please phone the Manager, Pollution Response on 3066 3911 or email pollution@msq.qld.gov.au

Contents



1 Introduction

This plan has been prepared by the Department of Transport and Main Roads in accordance with the agreed arrangements of Australia's National Plan for Maritime Environmental Emergencies (National Plan) and the requirements of the Transport Operations (Marine Pollution) Act 1995. It is a supplement to the Queensland Coastal Contingency Action Plan.

2 Scope

This plan deals with first-strike response to oil spills from ships and other sources within the port of Gladstone, Queensland. See Appendix A for details of geographical area.

3 Objective

The aim of this plan is to describe the operational arrangements of the Oil Pollution First-Strike Response Deed between Maritime Safety Queensland and the Central Queensland Ports Authority (formerly Gladstone Port Authority). In doing so the plan describes the first-strike response and handover arrangements for oil spills within the port, identifies available resources, and provides key contact information.

The plan is not a stand alone document and should be read in conjunction with:

- the Queensland Coastal Contingency Action Plan (QCCAP)
- Maritime Safety Queensland Standard Operating Procedures for oil spill response
- the Oil Pollution First-Strike Response Deed for the port of Gladstone.

4 Roles and Responsibilities

The roles and responsibilities for first-strike response to oil spills within the port limits of Gladstone are defined as follows:

- Maritime Safety Queensland is both Statutory and Combat Agency for response to all ship sourced oil spills.
- Gladstone Ports Corporation is responsible for first strike response, as per the Oil Pollution First-Strike Deed and this contingency plan, to all oil spills within the port limits.
- The Department of Environment and Heritage Protection (DEHP) is the Statutory Agency for land sourced oil spills and is responsible for assuming the role of Environment and Science Coordinator (ESC) for oil and chemical spills in:
  - harbours and working areas of the port outside of the Great Barrier Reef Marine Park, and
  - coastal waters outside the Great Barrier Reef World Heritage Area.
- This role will be exercised in full consultation and cooperation with the GBRMPA.

- The GBRMPA is responsible for assuming the role of ESC where oil or chemical spills occur within the Great Barrier Reef World Heritage Area and adjacent shorelines, excluding those harbours and working areas of the Port which fall outside of the Great Barrier Reef Marine Park. This role will be exercised in full consultation and cooperation with the DEHP.
- Maritime Safety Queensland will provide first strike capability support for land sourced oil spills, aside from spills from oil terminals, through a memorandum of understanding with DEHP which is the statutory and Combat Agency.
- The relevant oil company or terminal operator is the designated Combat Agency for first-strike response to oil spills from oil terminals. The cooperative arrangements for response to oil spills by the Australian oil and associated industries are described under the oil industry's AMOS Plan.
- Gladstone Regional Council is responsible for shoreline cleanup operations outside of the port security area under the direction of Maritime Safety Queensland.

Details of the roles and responsibilities may be found in Schedule 1 to the Inter-Governmental Agreement on Australia's National Plan for Maritime Environmental Emergencies.

5 Direction of Maritime Safety Queensland

Maritime Safety Queensland directs the Gladstone Ports Corporation to initiate and carry out first-strike response operations within the port of Gladstone in accordance with Section 8 of this plan.

6 Threat Assessment

In 2010, Maritime Safety Queensland commissioned a semi-qualitative risk analysis of oil spills from ships over 10 metres in length for all ports in Queensland. The results of the study show there is a risk of an oil spill occurring within the port of Gladstone, with the main risk factors being land-based spills, the frequency of small spills, refuelling activities and navigational hazards within the port. The port also has a high sensitivity rating.

The port of Gladstone contains a number of diverse environments, some of which are highly sensitive to the effects of marine pollution. These include large areas of mangroves, intertidal flats and seagrass beds close to the shipping channel and port area. Other areas, particularly The Narrows, are extremely sensitive to the environmental effects of oil spills. Similarly the Gladstone marina, Auckland Creek and Barney Point beach, as well as the islands within the harbour, are important recreational areas for the local community.

While the risk of a significant oil spill in the port is small, a number of activities that regularly occur in the port do present a credible threat. These activities include:

- large trading ships entering and leaving the port via a narrow channel
- oil product tankers discharging oil products at South Trees and Auckland Point Berths
- Chemical tankers discharging Caustic Soda at South Trees Wharf, Fisherman's Landing #2 Berth and Bulk Liquid Ammonia at Fisherman's Landing #5 Berth
- Large trading ships calling to load bunkers

- Large trading ships bunkering whilst undertaking cargo operations
- large trading ships coming in contact with berths or other ships
- significant commercial shipping activity and refuelling operations in the Marina
- commercial and recreational shipping activity in Auckland Creek and the adjacent marina
- commercial and recreational shipping activity in the Boyne River.

7 Possible Spill Scenarios

The most common type of oil spills likely to occur in the port are small spills of petrol, diesel fuel or bilge oil from commercial or recreational ships or shore based activities. However it is also possible that the following types of spills may occur within the port.

- 300 tonnes of heavy fuel oil from trading ships resulting from serious contact incidents
- 10 tonnes of petroleum products, including heavy fuel oil, during cargo transfer operations at anchorages and berths during bunkering operations
- 5 tonnes of petroleum products, including heavy fuel oil, during bunkering operations associated with the bunker barge *Larcom*.

While each of the scenarios listed above could escalate beyond what is generally termed ‘first-strike response’, prompt and effective action will help limit the effects of a spill.

8 Response Options

The following guidelines apply to first-strike response within the port.

Area	Monitor	Contain Recover	Protect Resources	Shoreline Cleanup	Apply Dispersant
Gladstone Marina	Yes	Yes	If viable	If viable	No
Auckland Creek	Yes	If viable	If viable	If viable	No
Fisherman's Landing	Yes	If viable	If viable	If viable	If viable
Clinton Wharves	Yes	If viable	If viable	If viable	If viable
Auckland Point Wharves	Yes	If viable	If viable	If viable	If viable
Barney Point Wharf	Yes	If viable	If viable	If viable	If viable
South Trees Wharf	Yes	If viable	If viable	If viable	If viable
Boyne Wharf	Yes	If viable	If viable	If viable	If viable
Areas seaward of Facing Island	Yes	If viable	If viable	If viable	If viable
Boyne River	Yes	If viable	If viable	If viable	No

Note : Any decision to use dispersants within the port area should be made in accordance with the dispersant use policy and guidelines outlined in the Queensland Coastal Contingency Action Plan. Under the guidelines:

- Prescribed Officers from GBRMPA, AMSA and Maritime Safety Queensland may authorise the use of dispersants within areas of the port that lie within the Marine Park
- Prescribed Officers from AMSA and Maritime Safety Queensland, in consultation with EPA, may authorise the use of dispersants in port areas that are outside the Marine Park.

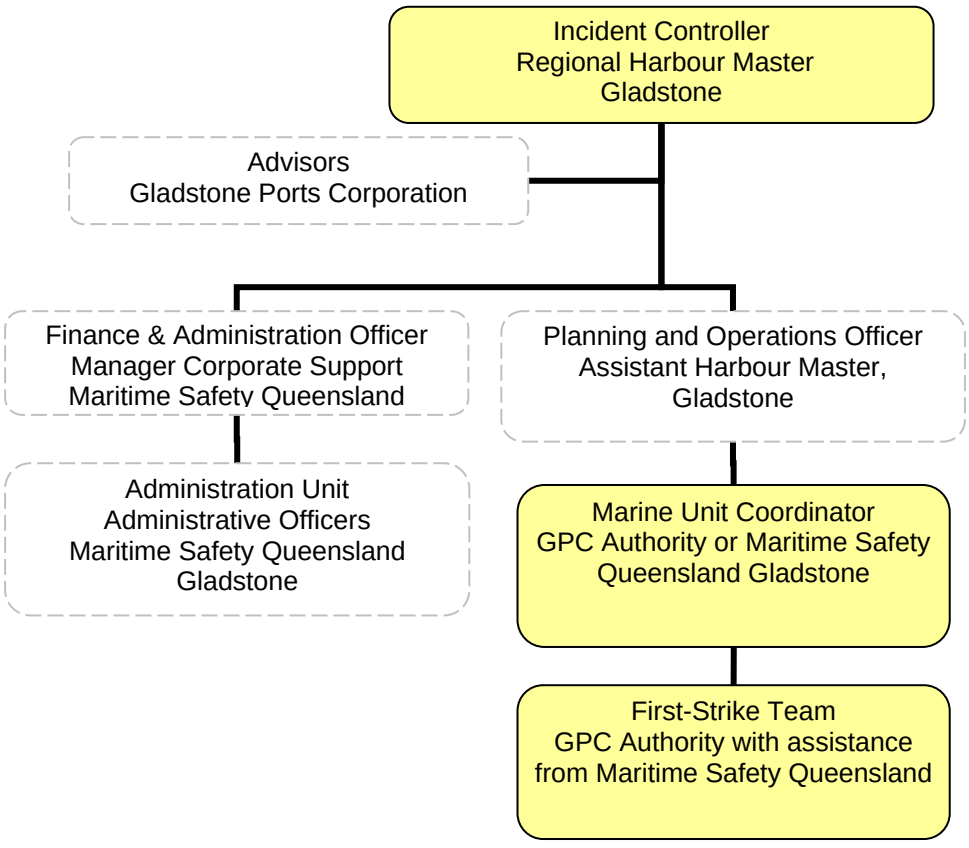
9 Response and Handover Arrangements

Early first-strike response action should include an assessment of the time and resources required to effectively manage each incident. Where a response is likely to be prolonged or exceed the port's first-strike response capacity, GPC should request assistance from Maritime Safety Queensland. When determining the need for assistance and hand-over of the response, GPC should consider the number and availability of local trained response personnel, their ability work safely without the need for excessive work hours, and the capacity of the ports' first-strike response equipment. Requests for assistance should be made as soon as possible and preferably in the first or subsequent SITREPs.

10 Incident Control Centre

The Incident Controller may elect to establish an Incident Control Centre (ICC) to aid in management of an incident within the port. If required, the ICC will be established in the office of the Regional Harbour Master (Gladstone).

11 Response Team Structure



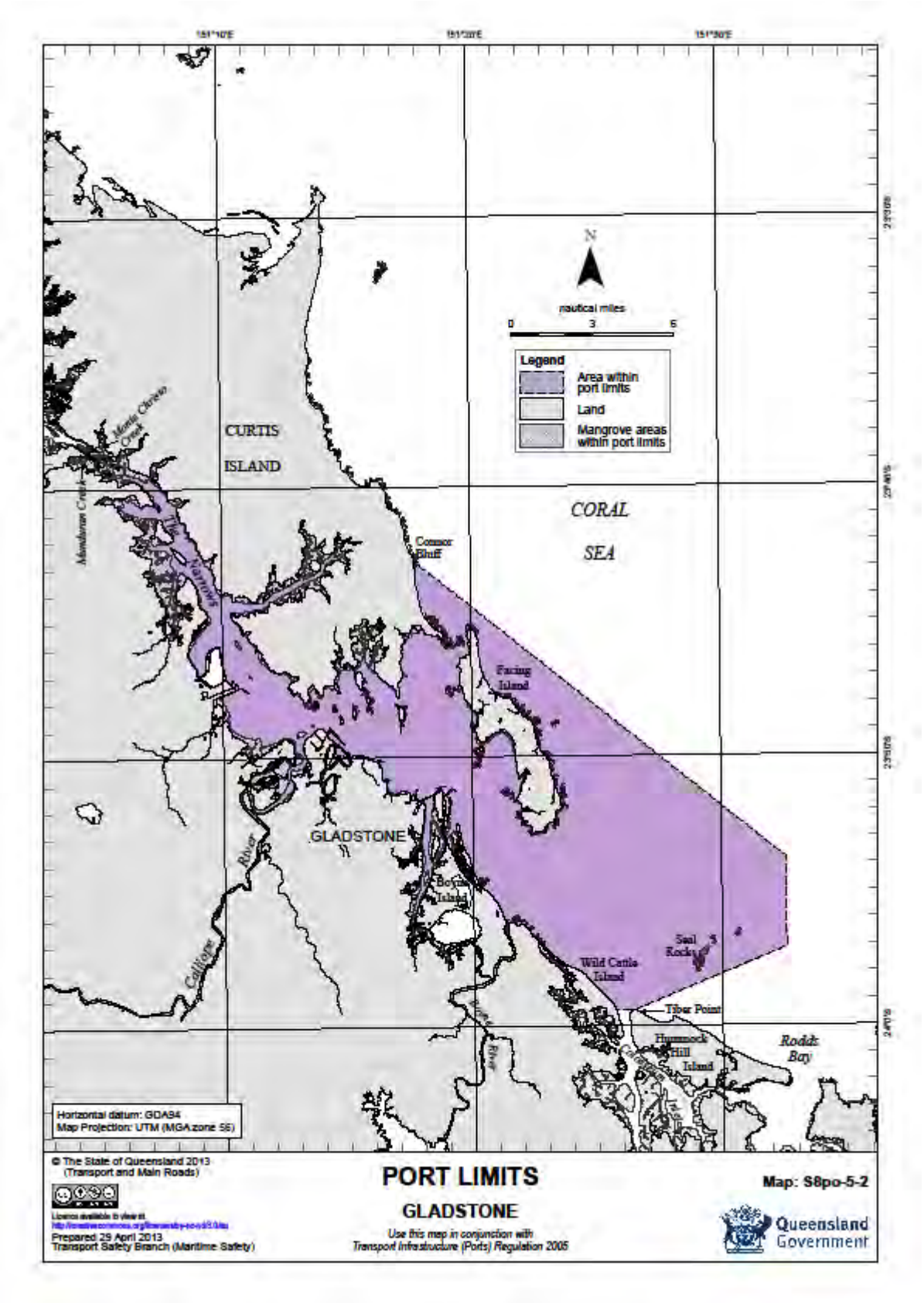
12 First-Strike Equipment

Equipment	Maritime Safety Queensland Marine Operations Base Alf O'Rourke Drive, Gladstone
Boom (Structurflex GP)	300 metres
Boom (Structurflex Land/Sea)	60 metres
Skimmer (Foilex weir and Spate pump)	1
Container (10m³ Flexidam)	2
Anchor Kit	1
Sorbent Boom	120 metres
Sorbent Pads	500 pads
Sorbent Mops	150 mops

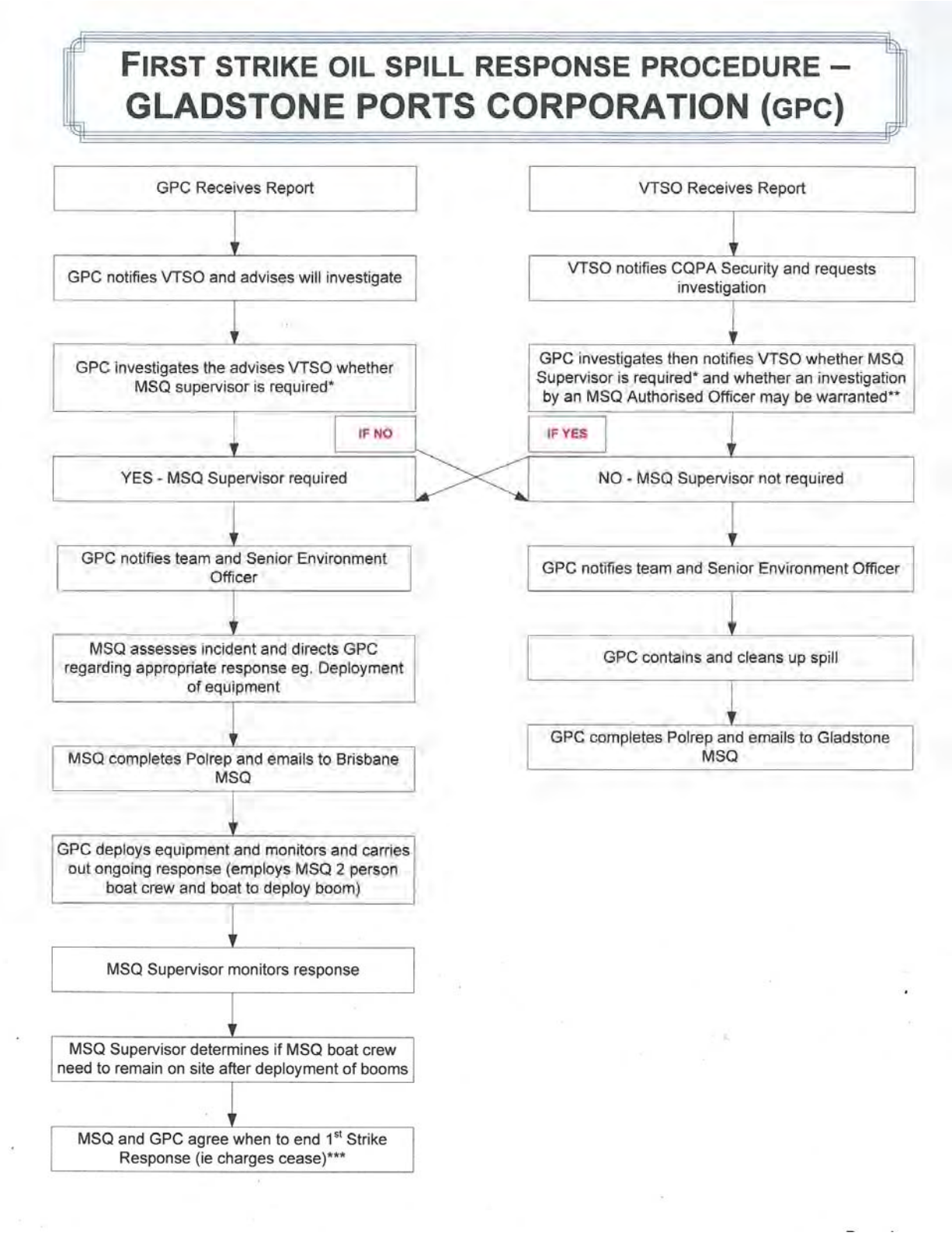
13 Contact List

Role	Position	Phone	Mobile
Gladstone Port Control	Duty VTS Officer	4973 1208	24 hours
MSQ Incident Controller	Regional Harbour Master, Gladstone	4971 5200	0407 878 852
Planning & Operations Officer	Assistant Harbour Master (Gladstone)	4971 5200	0459 827 398
Finance & Administration Officer	Manager Corporate Support, MSQ Gladstone	4971 5276	0409 340 365
Marine Unit Coordinator	Gladstone Ports Corporation	4976 1333	24 hours
Environment and Science Coordinator for spills that are unlikely to impact the GBRMP	DEHP	1300 130 372 Extension 2 24 hours 0427 401 931 0408 758 802	1300 130 372 Extension 2 24 hours
Environment and Science Coordinator for spills that are likely to impact the GBRMP	GBRMPA	4750 0700	3830 4919 quote 'oil spill' 24 hours
Shoreline Cleanup Coordinator	Gladstone Regional Council, (Health Leading Hand)	0407 379906 or 4970 0700	After hours Emergency 4979 1134

Appendix A – Map of Gladstone Port Limits



Appendix B – GPC Oil Spill Response Procedure



Appendix E – Summary of potential impacts and relevant management plans to be implemented to minimise impacts

Direct/ indirect impact	Potential impact	Management plans							
		ASSMP	PWMP	VMP	FMP	WQMP	NVMP	AQMP	WMP
Establishment of the Western Basin Expansion reclamation area and BUF									
Direct	Permanent loss and/or fragmentation of terrestrial flora, intertidal flora and/or wetlands within the WBE reclamation area and BUF			✓					
	Direct loss of seagrass meadows, seagrass seedbanks and/or soft sediment habitats from the placement of core and armour material, and geotextile fabric for the WBE reclamation area bund wall and BUF			✓					
	Direct loss of habitat for coastal and estuarine fish as well as commercial and recreational fish and invertebrate species.			✓	✓				
	Loss and fragmentation of intertidal fauna habitats within the WBE reclamation area and BUF due to vegetation clearing and/or the placement of bund wall material, core and armour material			✓	✓				
	Direct contact or entrapment of fish and other marine fauna through construction activities and construction plant causing injury/mortality				✓				
	Entrapment of fauna within the constructed bund at the WBE reclamation area (i.e. when the bund is closed)				✓				
	Generation of underwater noise leading to displacement of fish species and other marine fauna				✓		✓		
	Injury and/or death of terrestrial fauna as a result of increased truck movements during the transport of reclamation bund wall material				✓				
	Mortality and injury of migratory shorebirds and loss of shorebird habitat			✓	✓				
	Disturbance as a result of increased noise, dust and/or vibration resulting in changes to migratory shorebird behaviour				✓		✓	✓	
Indirect	Increased edge effects on adjacent flora communities and habitat reducing the condition and/or quality of adjacent environments		✓	✓	✓				
	Erosion, sedimentation and decreased water quality in adjacent terrestrial, intertidal and marine areas may occur due to the transport of sediments from the WBE reclamation area and/or BUF					✓			
	Siltation and sedimentation, as well as changes in marine water velocities may result in erosion and siltation of the foreshore and intertidal environments during the placement of core and armour material at the WBE reclamation area and BUF					✓			

Direct/ indirect impact	Potential impact	Management plans							
		ASSMP	PWMP	VMP	FMP	WQMP	NVMP	AQMP	WMP
	Increase in pollutants and general waste in adjacent intertidal and terrestrial vegetation communities and wetland areas			✓					✓
	Damage to adjacent vegetation communities as a result of an increase in dust due to increased truck movements associated with the transport of reclamation bund material, and during the placement of core, and armour material and geotextile fabric at WBE reclamation area and BUF			✓				✓	
	Introduction and spread of weed and/or pest species into areas adjoining vehicle routes, the WBE reclamation area due to vehicle movements associated with the transport of bund wall material		✓						
	Decline in water quality and associated impacts on habitat, including an increase in sedimentation and suspended solids, spills of fuel or other hydrocarbon from truck movements and construction activities associated with the WBE reclamation area and BUF					✓			
	Decline in water quality and associated habitats due to impacts of PASS	✓							
	Decreases in water quality impacting terrestrial and/or intertidal vegetation communities and habitat as a result of changes to stormwater flooding associated with the placement of core and armour material at the WBE reclamation area and BUF			✓		✓			
	Short term decline in water quality resulting in impacts on reef habitat	✓				✓			
	Hydrological and water quality impacts resulting in alteration of reef habitat	✓				✓			✓
	Contaminant and sediment releases resulting in impacts on migratory shorebird habitat	✓				✓			✓
	Injury and/or death of fish and other marine fauna as a result of ingestion or entanglement of waste materials and marine debris				✓	✓			✓
	Increase hard substrate representing an alteration in habitat and food source for various fish species				✓				
	Potential impacts on intertidal habitat (e.g. seagrass) due to decreases in water quality associated with siltation and sedimentation	✓		✓		✓			
	Alterations to coastal and estuarine fish communities as a result of displacement or avoidance behaviours				✓		✓		
	Short term decline in water quality from contaminant and sediment releases to the marine environment and increased turbidity and sediment deposition on benthic macroinvertebrate assemblages due to WBE reclamation area and BUF construction activities	✓				✓			✓

Direct/ indirect impact	Potential impact	Management plans							
		ASSMP	PWMP	VMP	FMP	WQMP	NVMP	AQMP	WMP
	Displacement of fauna as a result of increased noise, vibration, dust and artificial lighting associated with: ▪ Placement of core and armour material at the WBE reclamation area and BUF ▪ Increased truck movements associated with the transport of reclamation bund wall material ▪ Establishment of the site compound				✓		✓	✓	
Removal and installation of navigational aids									
Direct	Potential impacts to water quality from oil spills from vessels undertaking the work. Contamination from hydrocarbons or other toxicants on board the vessel, although unlikely, has the potential to occur if accidentally released into marine environment.					✓			✓
	Potential noise impacts may occur at Facing Island from piling activities						✓		
	At Boyne Island, impact piling may be audible during the daytime above the background noise environment, but not at levels sufficient to suggest noise would be a significant impact.						✓		
	The potential impacts to fish and marine reptiles as a result of vessel strike and direct contact with construction plant				✓				
	The use of a hydraulic piling hammer will generate high levels of underwater noise having the potential to impact a variety of marine species, including fish and marine reptiles.				✓		✓		
indirect	Plastics and other packaging if released into marine waters, pose a risk to marine fauna.					✓			✓
	Underwater noise impacts to marine fauna during piling activities				✓		✓		
Stabilisation and maintenance of WB and WBE reclamation areas									
Direct	Excavation activities may expose buried PASS material to the atmosphere, consequently generating acid leachate.	✓		✓	✓	✓			✓
	Decant water that is stored in the stormwater ponds and routinely discharged into Port Curtis has the potential to be impacted by the acid leachate	✓		✓	✓	✓			

Direct/ indirect impact	Potential impact	Management plans							
		ASSMP	PWMP	VMP	FMP	WQMP	NVMP	AQMP	WMP
	Land contamination through the storage and use of oils, fuels, chemicals and hazardous materials for the operation of machinery, vehicles and other equipment. Incidents involving fuel/oil spills and other contaminants may result in soil contamination or contamination of marine waters of Port Curtis.	✓		✓	✓	✓			✓
	There is also the potential for soil erosion and runoff from the reclamation areas, although the potential risk is low given the minor scale and nature of the maintenance activities. erosion and runoff can impact upon water quality and potentially impact seagrass.	✓		✓		✓			
	The transport of dredged material from the BUF to the reclamation areas and moving material around the reclamation areas have the potential to impact upon air quality.							✓	
Indirect	Erosion of the surface of the reclamation area may occur during stabilisation and maintenance activities due to wind and rainfall, potentially causing dust and water quality impacts.	✓				✓		✓	
	Potential for incorrectly disposed waste to enter marine waters and impact marine flora and fauna			✓	✓				✓
	Potential for incorrectly disposed waste to impact the visual amenity of the area								✓
	The introduction and spread of pests/weeds in the area from the introduction of contaminated vehicles to the site		✓						

Table notes:

ASSMP	Acid Sulfate Soils Management Plan	PWMP	Pest and Weed Management Plan
VMP	Vegetation Management Plan	FMP	Fauna Management Plan
WQMP	Water Quality Management Plan	NVMP	Noise and Vibration Management Plan
AQMP	Air Quality Management Plan	WMP	Waste Management Plan