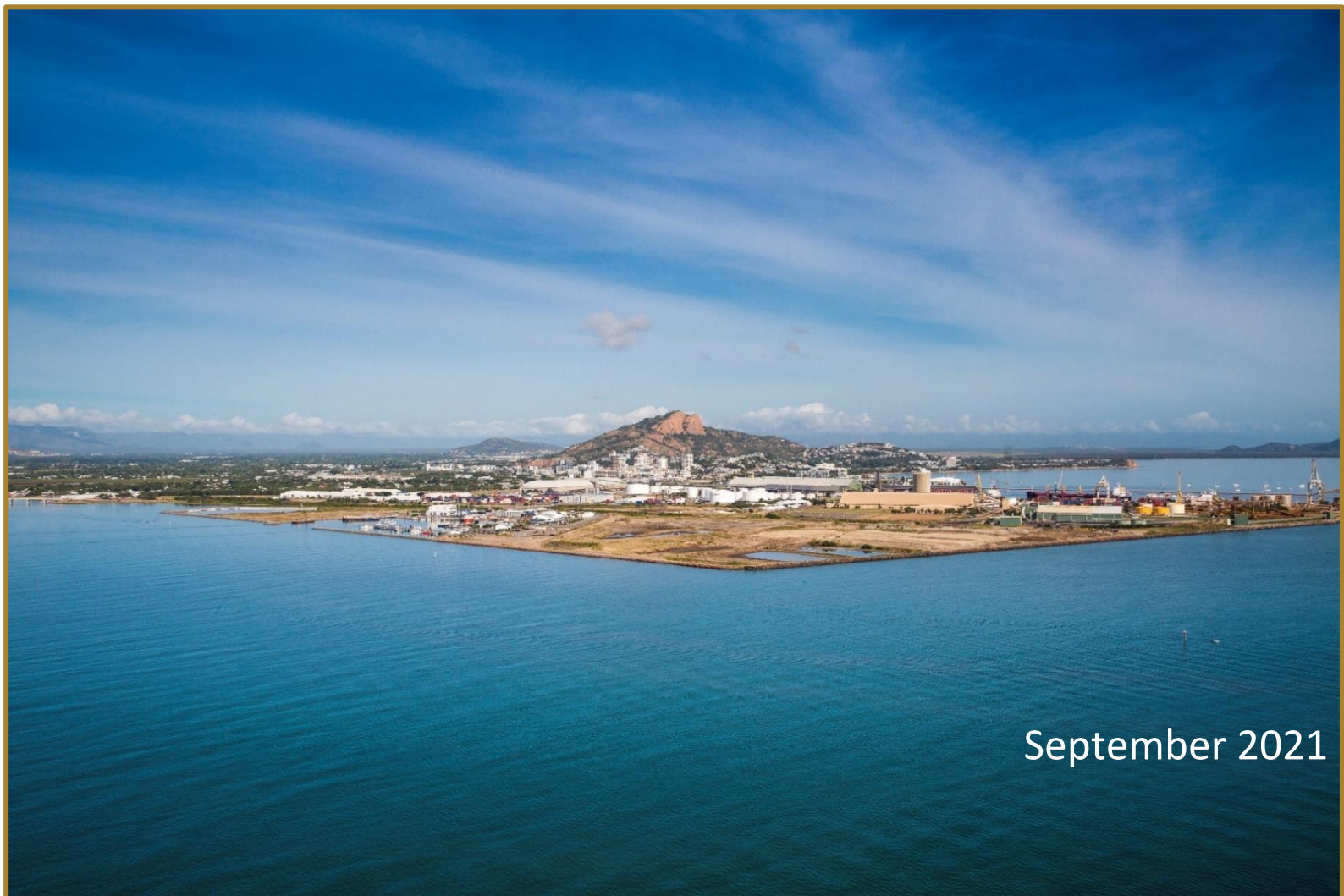


# **Townsville Port Expansion Channel Upgrade Project**

## **Offset Management Strategy**



## Document Control Sheet

### Revision History

Revision No.	Date	Changed by	Nature of amendment
0	26/2/2020	T Smith	Submitted version
1	16/09/2021	M Louden	Revised to incorporate dredging related offset details

### Document approval

Approval of the OMS R0 was issued by DAWE on 26 February 2020.

The OMS R0 was published on the CU Project's website on 11 March 2020.

This document has been prepared to meet the Commonwealth Government's EPBC Approval No. 2011/5979 Conditions and the Queensland's Coordinator General's Conditions for the Port of Townsville Limited's Port Expansion Project.

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## DECLARATION OF ACCURACY

**EPBC Number** 2011/5979  
**Project Name** Port of Townsville Port Expansion Project  
**Approval Holder** Port of Townsville Limited  
**ACN / ABN** 130 077 673 / 44 411 774 236  
**Approved Action** To expand the Port of Townsville, in Townsville Queensland. The action is for dredging, land reclamation and construction of infrastructure.  
**Location of the Action** Townsville, Queensland

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed



Full name (please print)

Marissa Wise

Organisation (please print)

Port of Townsville Limited

Date: 17/09/2021

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## GLOSSARY

<b>AEIS</b>	Townsville Port Expansion Project: Additional Information to the Environmental Impact Statement - Final (June 2017).
<b>Berth</b>	Any dock, pier, jetty, quay, wharf, marine terminal or similar structure, (whether floating or not) connected to the shore, at which a ship may tie up, not including floating plant, jack-up barge, or other similar structure not connected to the shore
<b>BHD</b>	Backhoe dredge
<b>Capital Dredge Material</b>	Material (clays, silts and sands) derived from capital dredging
<b>Capital Dredging</b>	As defined in the NAGD, being 'dredging for navigation, to enlarge or deepen existing channels and port areas or to create new ones'
<b>CU Project</b>	Townsville Port Expansion Channel Upgrade Project
<b>Commencement / Commence</b>	Any works that are required to be undertaken for construction (includes works associated with the construction of the reclamation area, pile driving activities, dredging activities, and any infrastructure associated with the action). Excludes preliminary works.
<b>DAF</b>	Queensland Department of Agriculture and Fisheries
<b>Department / DAWE</b>	The Australian Government Department of Agriculture, Water and the Environment, or any other agency administering the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth) from time to time
<b>Diagonal Breakwater</b>	This is the new breakwater to be constructed from the removal of the northern section of the Western Breakwater and the eastern section of the Offshore Breakwater (as shown in Figure 5
<b>EIS</b>	Townsville Port Expansion Project Environmental Impact Statement (March 2013)
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
<b>Fine Sediment</b>	As defined in EPBC 2011-5979, <15.6µm fine silt and clay
<b>IDMP</b>	Inshore Dolphin Monitoring Plan
<b>ITAC</b>	Independent Technical Advisory Committee
<b>Listed Dolphin Species</b>	Australian snubfin dolphin ( <i>Orcaella heinsohni</i> ) and Australian humpback dolphin ( <i>Sousa sahulensis</i> ). Note: definition amended to replace Indo-Pacific humpback dolphin ( <i>Sousa chinensis</i> ) with <i>Sousa sahulensis</i> based on revised speciation and listing - <a href="https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=87942">https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=87942</a>
<b>Mechanical Dredge</b>	A dredger that removes sediments via mechanical methods. Can include grab dredges (clamshells and buckets) or backhoe dredges.
<b>Minister</b>	The Minister administering the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth) and includes a delegate of the Minister
<b>MNES</b>	Matters of National Environmental Significance: In the context of this approval: Great Barrier Reef World Heritage Area, Great Barrier Reef National Heritage

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place, listed turtle species, listed dolphin species and all other Cetaceans, Dugong (*Dugong dugon*) and Commonwealth marine area.

**PEP** Port Expansion Project

**Port** The Port of Townsville Limited

**Reef Trust** The account established through the Public Governance, Performance and Accountability Act (*Reef Trust Special Account 2014*) Determination 01 by the Minister for Finance under section 78 of the PGPA Act or any other special account established by the Minister for Finance under section 78 of the PGPA Act for the purpose of protecting, repairing or mitigating damage to the Great Barrier Reef World Heritage Area or a fund approved by the Minister for an equivalent purpose

**Residual impact** The level of impact to a protected matter that remains following all actions to avoid and mitigate this impact (from the DAWE Offset Policy 2012).

**Significant** An event that is important, notable or of consequence, having regard to its context or intensity (broadly from DAWE Significant Impact Guidelines 1.1 (2013).

**Significant residual impact** An adverse impact, whether direct or indirect, of an activity that:  
 (a) remains, or will or is likely to remain, (whether temporarily or permanently) despite on-site mitigation measures for the prescribed activity; and  
 (b) is, or will or is likely to be, significant.

*(generally taken from Qld Environmental Offsets Act 2014).*

**Stage/s** As identified at Section 2.4.1 of the *Townsville Port Expansion Project - Additional Information to the Environmental Impact Statement (October 2016)*

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# 1 INTRODUCTION

## 1.1 Background

Port of Townsville Limited (the Port) is a Government Owned Corporation established under the *Government Owned Corporations Act 1993*, which manages the Port of Townsville. The Port is located on Cleveland Bay, approximately three kilometres east of the Townsville city centre in North Queensland (Figure 1). It is a multi-purpose port that handles predominantly bulk and general cargo with a land and sea jurisdiction in excess of 450 km<sup>2</sup>. The Port is situated in the Great Barrier Reef World Heritage Area, outside of the Great Barrier Reef Marine Park. Surrounding the Port of Townsville is Cleveland Bay and the community of Townsville. Townsville is a long-established township with a history of urbanisation and industrial activities in the Ross River and Ross Creek drainage system.

The Townsville Port Expansion Channel Upgrade Project (CU Project) is Stage 1 of the Port's long-term Port Expansion Project (PEP). The PEP aims to create a series of strategic assets that will address current capacity constraints and accommodate future growth in trade over a planning horizon to 2040. It includes development of port infrastructure, namely work to "top of wharf" facilities, capital dredging; reclamation; breakwaters and revetments; berths; access roads; rail loop; and trunk services and utilities. It does not include the development of "above wharf" infrastructure such as terminal pavements; ship-loaders and unloaders; product conveyors; storage buildings for products; rail loaders and unloaders; stacking and reclaiming equipment; storage tanks; and pipelines, which will be subject to separate statutory assessment and approval requirements prior to the start of their construction and operations.

## 1.2 Environmental Assessment & Approvals

Environmental assessment for the proposed PEP was undertaken in accordance with the requirements of the *Queensland State Development and Public Works Organisation Act 1971* and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as it was considered likely to have impacts on the following Matters of National Environmental Significance (MNES):

1. World Heritage properties (EPBC Act sections 12 and 15A);
2. National Heritage places (EPBC Act sections 15B and 15C);
3. Wetlands of international importance (EPBC Act sections 16 and 17B);
4. Listed threatened species and communities (EPBC Act sections 18 and 18A);
5. Listed migratory species (EPBC Act sections 20 and 20A);
6. Commonwealth marine areas (EPBC Act sections 23 and 24A); and
7. Great Barrier Reef Marine Park (EPBC Act sections 24B and 24C).

The PEP Environmental Impact Statement (EIS) and the PEP Additional Information to the Environmental Impact Statement (AEIS) were prepared to describe the results of ecology surveys and environmental impact assessments for the Project. After considering submissions made in response to the PEP EIS/AEIS, the Queensland Coordinator-General issued an *Evaluation Report on the Environmental Impact Statement for the Townsville Port Expansion Project* in September 2017. The Commonwealth Minister for the Environment and Energy issued EPBC Approval No. 2011/5979 on 5 February 2018. Conditions of the EPBC approval include that the person undertaking the Project must submit an Offset Management Strategy (OMS) for approval to the Minister. Appendix A lists the conditions relevant to this OMS.

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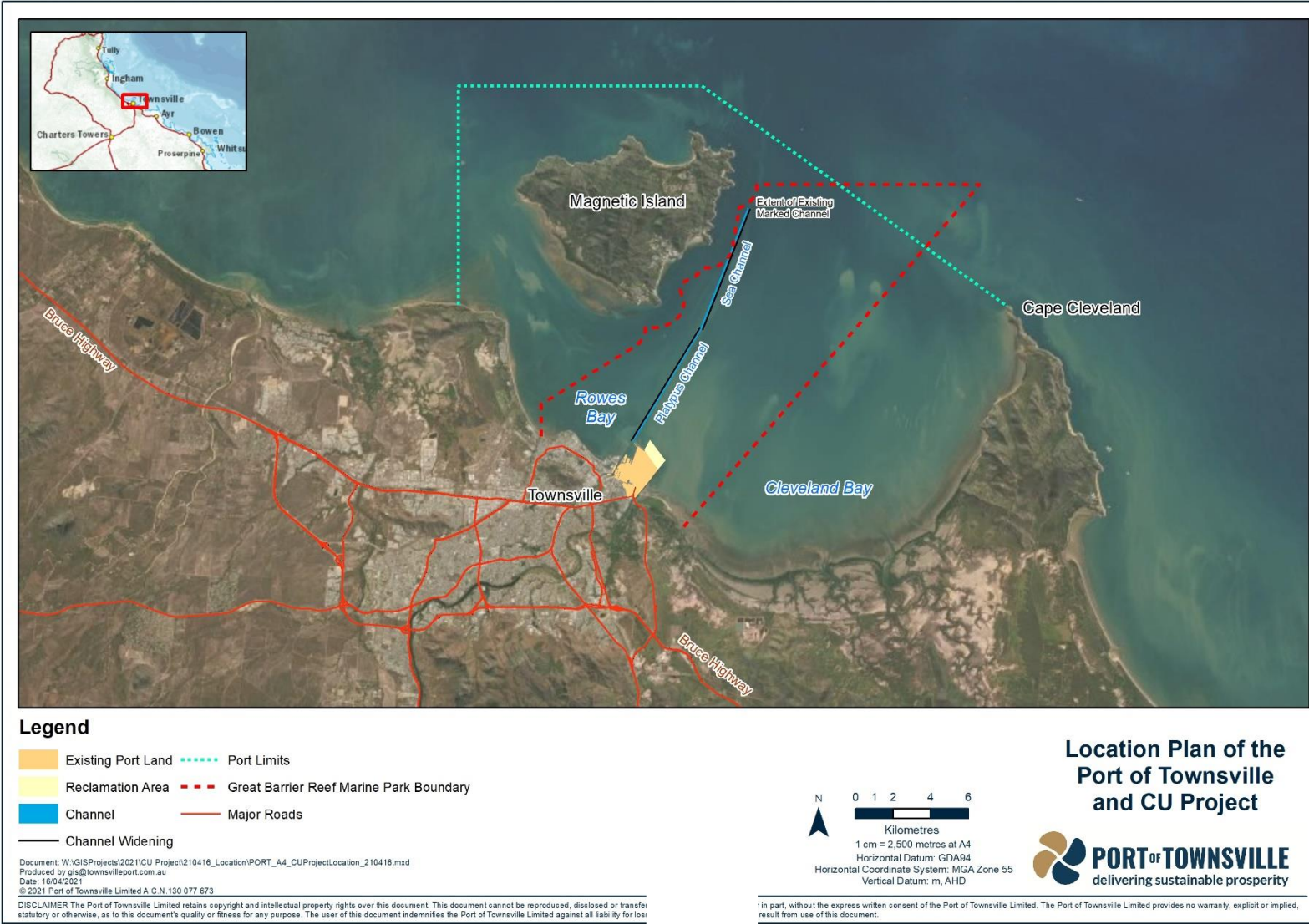


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Under the Port's Environmental Policy, "the Port is committed to sustainable development and operation through responsible environmental management".

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Figure 1: Locality Plan of the Port of Townsville & CU Project



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## 2 OFFSET MANAGEMENT FRAMEWORK

The Port recognises that there may be environmental impacts from port development and is committed to providing offsets as described in the EPBC approval conditions. These would compensate for any residual impacts to MNES resulting from all stages of the PEP, including the CU Project, i.e. Stage 1 of PEP.

Potential for residual impacts to affect MNES as a result of the CU Project have been assessed through the PEP environmental impact assessment process and are described by the PEP AEIS. The AEIS took into account design and other strategies that demonstrated the principals of avoiding risk of impact and mitigating risks where avoidance was not fully feasible. Based on that assessment, the CU Project is not expected to have a significant residual impact on any MNES following the application of identified mitigation measures. Regardless, the Port is required under the EPBC Act conditions of approval to prepare this OMS to satisfy the CU Project's MNES offset requirements, as stipulated in the EPBC Approval No. 2011/5979.

The Port's overall approach is to deliver environmental offsets in a coordinated and strategic manner, through securing offsets to provide conservation outcomes in an efficient and timely manner.

### 2.1 PEP Project Staging

As detailed in the EIS and AEIS, the PEP is proposed to be developed progressively to match the demand for additional port facilities. The staging comprises 3 primary stages of development as follows:

- Stage 1 – Initial outer harbour reclamation, channel widening and Berth 12;
- Stage 2 – Ultimate outer harbour reclamation, Berths 14, 15 and 16; and
- Stage 3 – Channel deepening, Berths 17 and 18.

Further details of each stage are provided in the following sections and summarised in Table 1.

#### 2.1.1 Stage 1

As detailed in Section 3, stage 1 of the PEP will involve:

- construction of perimeter revetment structures (rock wall) for the initial reclamation area;
- widening of the Platypus and Sea Channels through capital dredging; and
- development of Berth 12 (including dredging of the berth/basin area) and associated landside infrastructure.

Development of Berth 12, while part of PEP stage 1, will not be undertaken as part of the CU Project. As wharf infrastructure construction will be demand driven, this aspect of stage 1 will only proceed as required.

In meeting the statutory requirements, a separate / amended OMS will be developed for approval by the Minister or delegate prior to commencement of construction.

#### 2.1.2 Stage 2

Stage 2 of the PEP will involve:

- construction of the remainder of the perimeter revetments for the ultimate outer harbour reclamation area as well as construction of the North Eastern Breakwater; and

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- development of Berths 14, 15 and 16 in the outer harbour, including dredging of basin areas and associated landside infrastructure.

In meeting the statutory requirements, a separate / amended OMS will be developed for approval by the Minister or delegate prior to commencement of construction.

The main construction activities at this stage are intended to be similar to the construction undertaken in the CU Project (Stage 1). Development of Berths 14, 15 and 16 could be undertaken in one or more construction phases according to demand for facilities.

**2.1.3 Stage 3**

Prior to Stage 3 commencement, the outer harbour perimeter revetments and North Eastern Breakwater will be constructed. As such, Stage 3 development will only involve:

- deepening of the Platypus and Sea Channels; and
- development of Berth 17 and Berth 18 (including dredging of berth pockets) and associated landside infrastructure.

The Platypus and Sea Channels will be dredged to deepen the navigational channels, resulting in a likely extension of the length of the Sea Channel. Development of Berth 17 and Berth 18 could be undertaken in one or two construction phases according to demand for facilities. The berths will be located in a harbour basin with breakwater protection from waves which will enable them to be developed to suit a variety of port operations.

In meeting the statutory requirements, a separate / amended OMS will be developed for approval by the Minister or delegate prior to commencement of construction.

The indicative construction timing for each stage of the PEP is detailed in Table 1:. This indicative program is dependent upon construction methodology and assessment and approval timeframes.

**Table 1: Indicative PEP staging program**

Stage	Total duration	Indicative duration of main construction activities
<b>Stage 1</b>	<b>4.5 years</b>	
Reclamation perimeter structures (Initial)*	12 months	Construction of revetment structure to create a 62 ha reclamation.
Channel widening*	2 – 3 years	Capital Dredging to widen Sea and Platypus Channels.
Berth 12**	TBC	Capital dredging to deepen the existing outer harbour basin and dredging of basin area and pocket for Berth 12. Concurrent construction of wharf and landside infrastructure.
<b>Stage 2**</b>	<b>4.5 years</b>	
Reclamation perimeter structures (ultimate) & North Eastern Breakwater		Construction of remaining revetment structure to create a total 152 ha reclamation area for depositing of dredged material.
Berth 14 Berth 15 Berth 16		Capital Dredging of basin area for Berth 14,15 and 16, including dredging of the Berth pockets. Construction of wharf and landside infrastructure.

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Stage	Total duration	Indicative duration of main construction activities
<b>Stage 3**</b>	<b>2.5 years</b>	
Berth 17 Berth 18		Capital Dredging of berth pockets for Berth 17 and Berth 18. Construction of wharves and landside infrastructure.
Channel deepening		Capital Dredging to deepen Sea and Platypus Channels.

\* Activities associated with Channel Upgrade Project

\*\* Activity not part of the Channel Upgrade Project

## 2.2 Delivery Approach to Offset Management Strategy

This OMS has been prepared to meet the relevant Conditions of EPBC Approval No. 2011/5979, as detailed in Appendix A.

The Port is proposing to stage the delivery of environmental offsets under the EPBC Act for the PEP based on the stages of development. Consistent with Condition 29, the OMS will be developed to be aligned with each stage and construction phase as the project progresses.

For future stages of the PEP, the planned works and environmental risks and impacts will be developed and incorporated into the OMS relevant to that stage for approval by the Minister. As the PEP is planned to be completed over a 30 year time frame, the development of specific and relevant offsets associated with each stage of works at that time will provide a more relevant and beneficial approach.

In meeting the statutory requirements, the residual significant impacts from the construction activities will be offset in accordance with the Offset Management Strategy prepared and approved for that development stage.

## 2.3 Steps in the Development of the OMS

The OMS has been developed, and will be revised further, in accordance with the following steps:

1. Development of a draft OMS for the relevant stage/phase of construction activities, utilising the services and input of specialised consultants where relevant.
2. Revision of the draft OMS through consultation with key stakeholders, incorporating their comments prior to lodgement with the Department of Agriculture, Water and the Environment (DAWE);
3. Independent peer review (per Condition 31) and input from the ITAC (where provided);
4. Consultation with DAWE and finalisation of OMS for approval by the Commonwealth Minister for the Environment (or delegate);
5. Implementation of OMS for the relevant stage of the PEP (per Condition 30);
6. Refinement of the OMS during implementation, where new data or information is received that will inform the most appropriate approach to offsetting any residual significant impact; and
7. Review and finalisation of the OMS for the relevant stage/phase of the project, including the identification of any improvements to be incorporated into future OMS approaches.

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For all stages, the determination of residual significant impact caused by the activity and the offset to be applied will be established through formal monitoring and evaluation methods. As demonstrated in this OMS for the CU Project, detailed and rigorous monitoring programs will be implemented to inform the impact assessment process, to be implemented by suitably trained and experienced personnel.

Once impacts are determined, the Port will make use of contemporary offset approaches and methodologies to maximise the benefit to MNES. the Port will engage suitably qualified and experienced experts to ensure all offset determinations are accurate and to ensure that a net benefit to the outstanding universal value of the Great Barrier Reef is obtained. All offset methodologies will be discussed with the Department prior to finalisation of the relevant OMS for that stage.

No stage of development will commence until the OMS (for that stage) has been approved by the Minister or delegate (as per Condition 27).

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### 3 CU PROJECT DESCRIPTION AND OFFSET APPROACH

The CU Project construction activities in the marine environment primarily involves:

- Creation of a 62 hectare reclamation area (Figure 2) via the construction of rock walls and revetments forming receival ponds for beneficial re-use of all capital dredge material from the channel widening works.;
- Figure 4 Capital dredging works of approximately 3.9 million cubic metres from the channels using a mechanical dredge, involving:
  - o On its western side to widen the Platypus Channel (Figure 3) from 92 metres width to 180 metres (at the harbour entrance) tapering to 135 metres (at the seaward end);
  - o On its eastern side to widen the Sea Channel (Figure 3) from 92 metres to 120 metres along its length;
- Installation and operation of a temporary offloading facility to facilitate the reclamation works, including capital dredging of an access channel and mooring area (Figure 4);
- Construction of the Diagonal Breakwater, involving realignment of the seaward end of the western breakwater to allow for a widening of Platypus Channel at the harbour entrance (Figure 5), including capital dredging as part of the breakwater footprint; and
- Installation of navigation aids in alignment with the new channel configuration.

The capital dredging, construction activities and infrastructure development for the CU Project will occur inside the existing port limits, the designated water areas in which navigation falls under the control of the Regional Harbour Master.

The capital dredge campaign will last approximately –2 – 2.5 years and dredge approximately 3.9 million cubic metres from the channels using a mechanical dredge. Dredging is intended to be undertaken by mechanical BHD only, with some early dredging works undertaken by a smaller mechanical dredge. As the early dredging would be with smaller plant than the BHD (Woomera), the stated additional controls for the Woomera are considered to be sufficient. The capital dredge material will be placed within the new reclamation area as part of land reclamation activities. Dewatering and ground improvement of emplaced sediments within this area will be undertaken.

Land-based construction activities will occur on the new reclamation area, namely Lot 794 on SP308904 adjacent to the northern extent of the East Port area, namely Lot 791 on EP2348 which is Strategic Port Land (Figure 2).

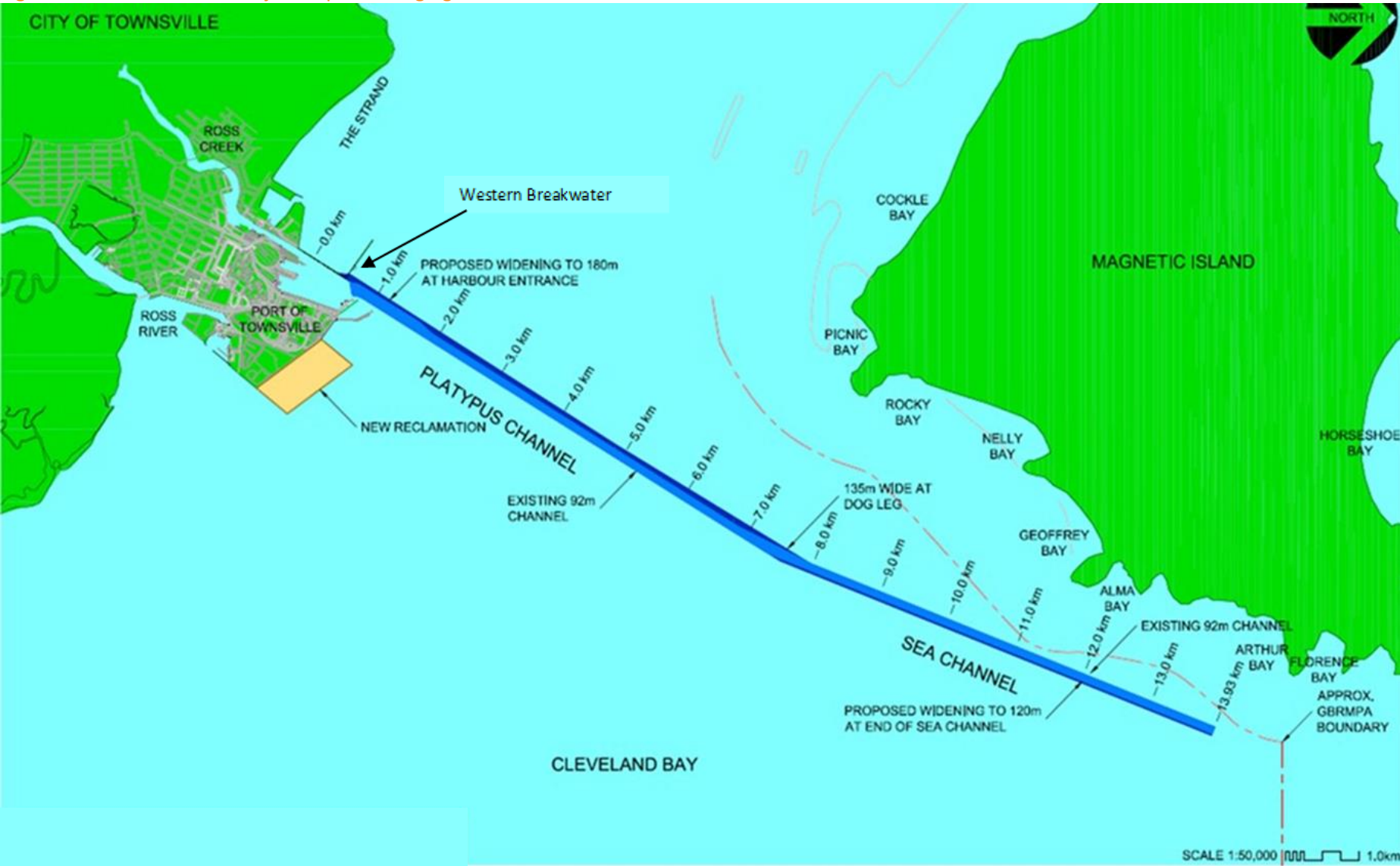
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Figure 2: Site Plan for CU Project Rock Wall Construction & Reclamation Activities



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Figure 3: Site Plan for CU Project Capital Dredging Activities



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Figure 4: Site Plan for CU Project Temporary Offloading Facility (adjacent to new rockwall)

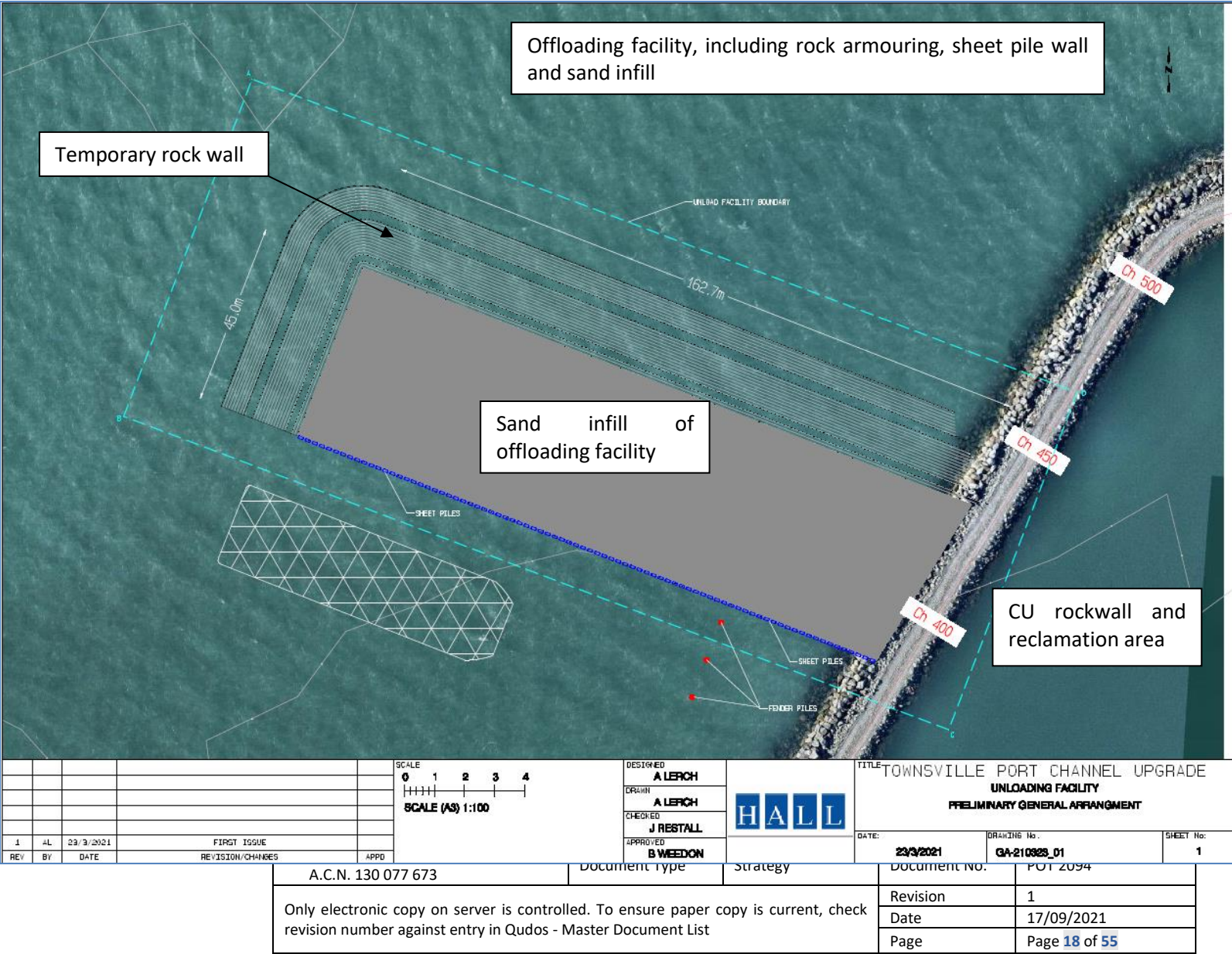
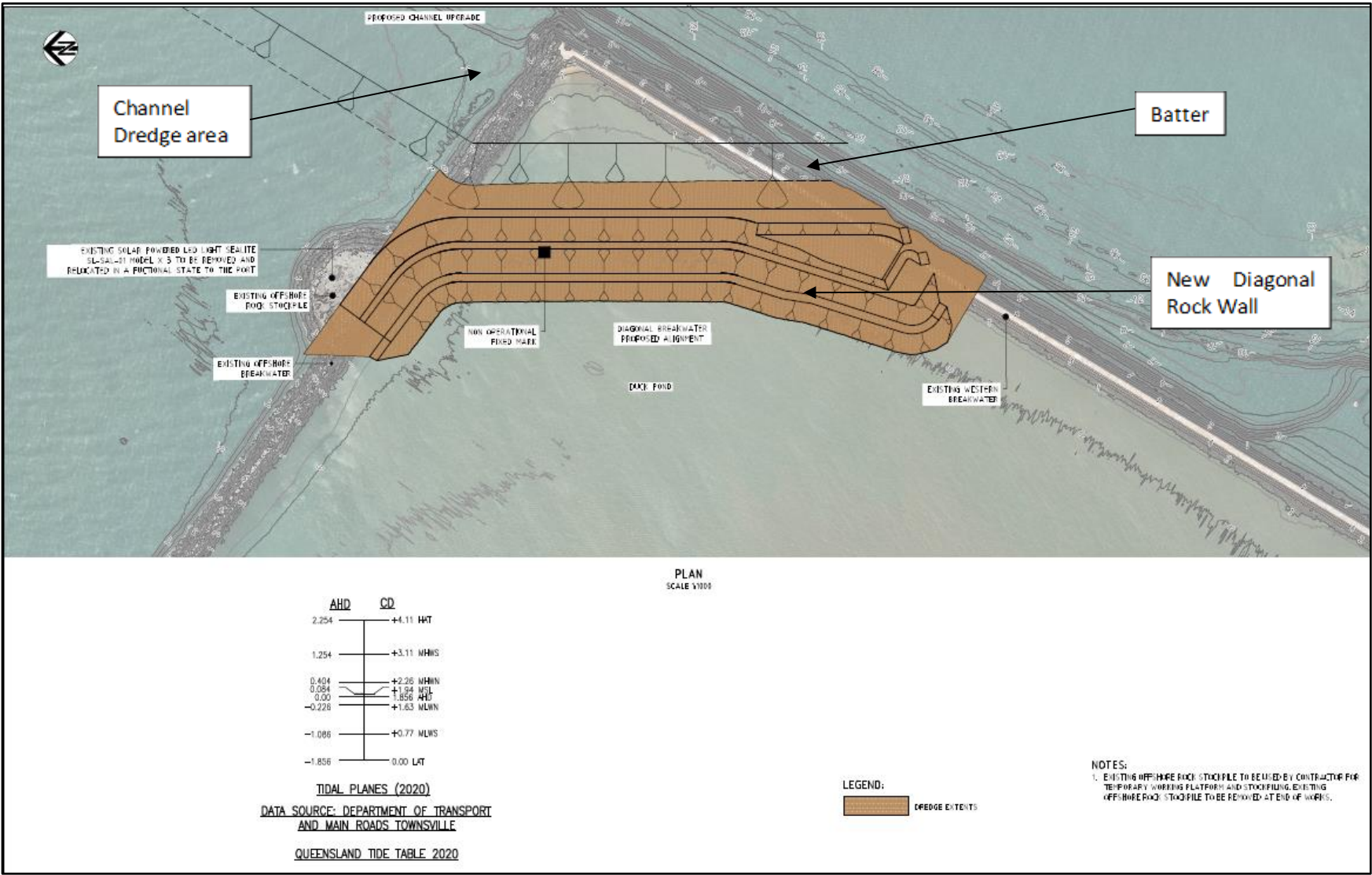


Figure 5: Diagonal Breakwater layout and footprint



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### 3.1 Scope and Objectives

This OMS is focussed on the potential residual significant impacts and environmental offsets associated with the CU Project. This OMS addresses the monitoring and offset commitments relevant to rock wall construction impacts and dredging impacts on seagrasses, listed dolphins and, the release of fine sediment.

Similarly, the development of Berth 12 is also included in this OMS structure, however as it does not form part of CU Project, it contains no details on the approach for determining residual significant impact or any proposed offset arrangements. As no detailed design of the berth has been developed, the extent of construction activities and risks posed are not able to be determined.

The objective of this OMS is to compensate for the residual significant impacts of the action to achieve a net benefit to the outstanding universal value of the Great Barrier Reef World Heritage Area. This will be achieved by establishing a framework for:

- achieving a reduction in sediment entering the marine environment from the Burdekin, Ross and Black river basins, based on the amount of fine sediment determined in Dredging Completion Reports;
- compensating for residual impacts to listed dolphin species, and
- compensating for the loss of seagrass within the dredge and reclamation footprint; and
- ensuring offset actions align with the strategies and programs in the Reef 2050 Long-term Sustainability Plan.

The Port recognises the preference for both direct offsets as highly localised solutions that would be of maximum local benefit to Cleveland Bay. As part of the development of the OMS, the Port has examined and reviewed what other major marine infrastructure projects had proposed in terms of offsets, including the offset packages and requirements approved for similar infrastructure projects both within the region and across Australia.

In order to minimise residual impacts, the Port will actively manage risk and reduce the potential for negative impacts on the environment during the CU Project's construction activities. This will be achieved by identifying and detailing appropriate and preferred environmental management controls for key activities to avoid or mitigate impacts. Environmental management plans have been developed to include measures that the Port believes are necessary and appropriate for protection of sensitive environmental receptors and to incorporate additional actions/controls as required by approvals/permits/licences that relate to the CU Project.

This OMS outlines:

- The offset funding and programs to address the requirements of Conditions 27 and 28;
- The alignment with strategies and programs for the Great Barrier Reef as outlined in Condition 27(e);
- A process for annual reviews, updates and reporting of delivery throughout the life of the approval as required by Conditions 27(f); and
- A proposed offset delivery approach as required by Condition 29.

The *Reef 2050 Long-term Sustainability Plan* and Commonwealth plans for listed dolphins are referenced (where relevant) to demonstrate how the CU Project's offsets commitments are aligned with objectives and actions set out in these Commonwealth documents (as outlined in Condition 27(e)).

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As noted previously, future stages of CU project and PEP will update this OMS to reflect the potential residual significant impacts associated with each relevant stage, consistent with Condition 29.

### 3.2 Previous Versions

Version 0 of this OMS was prepared and approved by the Commonwealth Minister for the Environment on 26 February 2020. This previous version set out offset arrangements related to seagrass and inshore dolphin impacts from the construction of the reclamation perimeter rockwall, as set out in Section 4. These works were undertaken from 2019-2021 in advance of the capital dredging required as part of the CU Project.

In accordance with Condition 31 of EPBC Approval No. 2011/5979, Version 0 the OMS was independently peer reviewed by the GHD Pty Ltd, before submission to the Minister for approval. This review included an analysis of the effectiveness of the outcomes, targets or management measures identified in the Strategy (per Condition 32). Additionally, this OMS was provided to the CU Project's Independent Technical Advisory Committee (ITAC) for input and advice where their expertise was applicable. A copy of all advice and recommendations made by the independent peer reviewers was provided to the Minister on 14 January 2020 (per Condition 33).

Version two – R1 (this document) – has incorporated updates to include all relevant constructions works associated with the CU Project – including construction works associated with the temporary offloading facility, repositioning of channel navigational aids, as well as the works associated with the construction of the diagonal breakwater / western breakwater realignment.

### 3.3 Development & Consultation of the OMS

This OMS has been developed in consultation with key stakeholders including:

- Representatives of the Traditional Owners, the Gurambilbarra Wulgurukaba people who are identified as the Native Title claimants covering the Project area;
- The Port's Community Liaison Group (CLG), which comprises a number of community representatives;
- NQ Dry Tropics, the natural resource management organisation operating in the Burdekin Dry Tropics region;
- Environmental, engineering and modelling consultants (where applicable); and
- Members of the Port executive management team;

Traditional Owners were consulted in accordance with Condition 25 of EPBC Approval No. 2011/5979 during the development of this Strategy. This consultation involved the following:

- An initial presentation to Traditional Owners on the CU Project on 20 February 2018;
- A subsequent presentation of the draft OMS to the nominated Traditional Owners representatives on 30 May 2019. Comments raised about the Strategy were noted during the meeting, with the Traditional Owners Working Group asked to provide any further comments on the Strategy within a nominated timeframe. All comments received from Traditional Owners were compiled, with the only offset related comment related to how a seagrass offset is applied should it be required;

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- An update regarding the consultation with the Traditional Owners Working Group was then presented to the CU Project Steering Committee, which formally noted that the Traditional Owners Working Group had been consulted in relation to the OMS.

Individual offset approaches (for rock wall and dredging activities) to be delivered under this OMS are described in Sections 4 and 5.

### 3.4 Independent Peer Review of the OMS

In accordance with Condition 31 of EPBC Approval No. 2011/5979, the OMS R0 was independently peer reviewed by the GHD Pty Ltd, before submission to the Minister for approval.

Version two (R1) of the OMS (this document) was peer reviewed by Dr Rick Morton from Rick Morton Consulting. All advice and recommendations made by the independent peer reviewer, including feedback on the changes made by the Port, was provided to the Minister with the OMS at time of submission (per Condition 33). This review included an analysis of the effectiveness of the outcomes, targets or management measures identified in the Strategy (per Condition 32).

Additionally, the fine sediment report and peer review was provided to the CU Project's Independent Technical Advisory Committee (ITAC) 16 March 2021 (and Peer review comments) for input and advice where their expertise was applicable.

A copy of all advice and recommendations made by the independent peer reviewers was provided to the Minister with this submission (per Condition 33).

### 3.5 Implementation of the OMS

Offset programs will be implemented in a staged process (as detailed in other sections of this Strategy). This OMS will not be implemented or amended in any way that contravenes any conditions of the EPBC approval or any other legislative requirements.

Where this Strategy sets out that a third party will undertake an offset program, the Port will advise that third party of the requirements and the Port will implement the appropriate reasonable steps to facilitate that party conducting the offset program (i.e. formal contractual arrangements).

#### 3.5.1 Funding & Timing Arrangements

The Port has committed funding in the CU Project's budget to achieve full implementation of all offset programs in this OMS. A provisional budget has also been set aside for forward budget planning for administration of the OMS Reporting and Responsibility.

Identification of offsets and delivery of the OMS will be completed in accordance with the requirements of the EPBC Act approval conditions.

As required in legislative conditions, an annual compliance report will be produced within three months of every 12 month anniversary of commencement of the action. The report will include, but not be limited to:

- i) Compliance with the conditions of the EPBC Approval 2011/5979;

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- ii) Information on any impacts detected through relevant monitoring programs (eg. IDMP, seagrass survey etc.)
- iii) Outcomes of the annual review of the OMS; and
- iv) A description of any offset actions and detail relating to how they align with broader strategies and programs for the Great Barrier Reef (eg. Reef 2050 long term sustainability plan) environmental impacts identified through project monitoring and the offset actions implemented to address.

Copies of annual report(s) will be kept on-site, will be published on the CU Project website in accordance with Condition 36 of EPBC Approval No. 2011/5979 and will be available for regulatory inspection upon request.

The Port will also make any relevant amendments to the environmental management plans (MEMP/DMP) and any monitoring programs as required as a result of the implementation of this OMS.

### 3.6 Review & Revision of the OMS

This OMS will be subject to regular review.

The Port will conduct activities in an environmentally responsible manner and to this end will conduct annual reviews of the performance of the OMS as part of its continuous improvement process. This review will address matters such as the overall effectiveness of the Strategy, environmental results from the marine water, seagrass, coral and inshore dolphin monitoring programs including performance of offset programs. The review process is outlined in Figure 6.

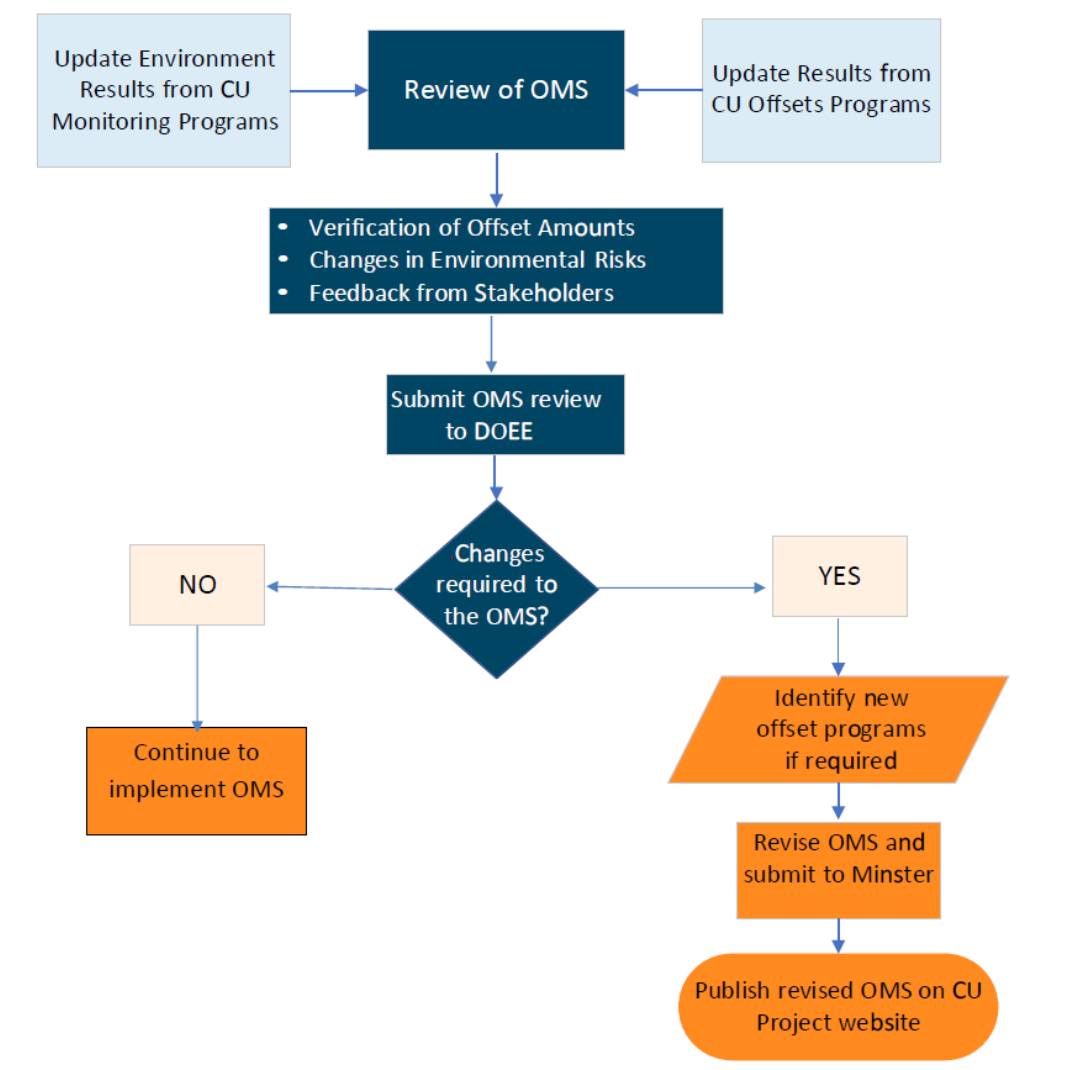
During delivery, review and amendment will also be completed to ensure the Strategy remains relevant and achieves the required objectives, inclusive of identification and implementation of any new or changing environmental risks and mitigation actions. Recommendations on improvements or amendments will be reported as part of the annual reporting process.

Changes to the OMS may be developed and implemented in consultation with relevant regulators and other stakeholders over time. Material revisions to the OMS and amendments to offset programs will only be made with the approval of the Minister (or delegate).

Editorial or other improvements to the OMS that do not affect the intent of the OMS will be made as required throughout delivery and noted for the Minister during annual compliance reporting. If the revised OMS meets Condition 38 of EPBC Approval No. 2011/5979, DAWE will be notified in accordance with the requirements of Condition 38 of the EPBC Approval. The outcomes of the offset programs will be made publicly available on the CU Project's website as part of the review of the performance of the OMS.

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Figure 6: Review Process



### 3.7 Records

During the CU Project, records will be maintained as objective evidence of compliance with environmental requirements, including measures taken to implement the OMS. All records will be maintained according to the Port’s Record Keeping Procedures and be kept for a minimum of five (5) years after the completion of the project or as required by the legislative conditions. Records will allow internal and external auditing and encourage the use of preventative action, as well as corrective action following any non-conformances . Records will be made available to the regulators as requested.

### 3.8 Uncertainty associated with OMS success

The CU Project will not be without uncertainties that could influence the ability of the Port to fully implement the OMS. These uncertainties are varied, with the key risks to the achievement of the plan detailed in Table 2. Control measures and risk ratings are also presented. All relevant steps will be taken to minimise the uncertainty associated with the success of this strategy, however given the dynamic environment in which the project is being undertaken, some uncertainty will remain.

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Table 2: Key uncertainties associated with implementation of this OMS.

Element	Impacting Process/ Potential Impact	Risk Receptor	Raw Likelihood / Consequence	Mitigation Measures	Residual Risk
Data uncertainty / Inaccuracy	<p>Failure to determine residual significant impacts due to data or information inaccuracies</p> <p>Environmental impacts occur due to incomplete understanding/ misunderstanding of impact.</p> <p>Establishing Project contribution to impact if residual significant impact detected (versus non-project causes).</p>	Sensitive receptors of Cleveland Bay	High (Likely / Major)	<p>The Port will use experienced contractors to design and implement monitoring programs to ensure accuracy and rigorousness.</p> <p>Extensive data collection occurred prior to commencement and externally reviewed through EIS/AEIS.</p> <p>Baseline data collected from key monitoring programs prior to commencement for comparison</p> <p>Adaptive framework to inform ongoing review of appropriate triggers and baselines during the program as new information is collected.</p> <p>Expert input into ongoing monitoring programs to ensure robustness of data, particularly through ITAC review and involvement and through peer review of monitoring plans.</p> <p>Hydrodynamic modelling validation to be completed to validate the predictions made for potential impacts from the CU Project.</p>	Low (Rare / Serious)
Failure to deliver offsets detailed in the Strategy	<p>Offsets applied are not successful in achieving outcomes</p> <p>No net benefit achieved.</p>	Sensitive Receptors of Cleveland Bay	Substantial (Likely / Major)	<p>The Port will implement a comprehensive monitoring and auditing program to review and confirm compliance with implementation of the controls in the plan.</p> <p>Delivery of offset program to utilise qualified personnel and organisations to ensure professional and comprehensive delivery (via formal contractual arrangements).</p>	Medium (Possible/ Serious)
	Breach of approval condition	Compliance record /Public Reputation		<p>Annual compliance review against approval conditions and OMS will be undertaken to demonstrate compliance. Reporting to regulators.</p>	

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Element	Impacting Process/ Potential Impact	Risk Receptor	Raw Likelihood / Consequence	Mitigation Measures	Residual Risk
				Dedicated environmental resources on the Project, by contractors and Port. CU Environmental staff (Manager and Advisors) remain across all approval requirements to ensure continuation in the absence of a staff member.  Oversight by Port, ITAC and Project regulatory committee	
Project monitoring not delivered	Monitoring programs not implemented due to lack of commitment, funding and resourcing	Sensitive receptors of Cleveland Bay	Medium (Likely / Serious)	The Port will use experienced contractors to design and implement monitoring programs to ensure accuracy and rigorousness.  Baseline data collected from key monitoring programs prior to commencement for comparison.  Expert input into ongoing monitoring programs to ensure robustness of data, particularly through ITAC review and involvement and through peer review of monitoring plans.  Detailed contract management process for key monitoring programs to ensure delivery of the program and identification of any limitations early.  CU Environmental staff (Manager and Advisors) remain across all monitoring programs to ensure continuation of programs in the absence of a staff member.	Low (Rare / Serious)
	Monitoring program not conducted due to failure to engage contractors or contractor poor performance	Consultant responsibilities			
	Failure to detect residual significant impact occur due to incomplete understanding of impact	Compliance & complaints record			
Loss of funding commitment to deliver project	Project ceases part way through delivery, or delivery reduced due to loss of funding.	Workforce	Medium (Unlikely / Major)	Funding arrangements established prior to project commencement, including significant Government funding commitments (both Qld and Commonwealth)  Regular reporting to Government to justify funding and demonstrating delivery of the project.  The Port commitment to deliver project and will be responsible for any funding shortfall.	Low (Unlikely / Minor)
	Insufficient funding to deliver monitoring for residual significant impact or to fund offset programs.	Sensitive receptors of Cleveland Bay			

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Element	Impacting Process/ Potential Impact	Risk Receptor	Raw Likelihood / Consequence	Mitigation Measures	Residual Risk
	Breach of approval condition	Compliance record / Public reputation		<p>Annual compliance review against approval conditions and OMS will be undertaken to demonstrate compliance</p> <p>Dedicated environmental resources on the Project, by contractors and Port. CU Environmental staff (Manager and Advisors) remain across all approval requirements to ensure continuation in the absence of a staff member.</p> <p>Oversight by Port, ITAC and Project regulatory committee</p>	
Severe / extreme weather	Severe and extreme weather events result in damage to partially constructed infrastructure, which in turn can impact on MNES and marine environment.	Port infrastructure	Likely / Major (High)	Implement the Port Cyclone Response Plan which establishes clear actions and steps to be taken in the preparation for, response to and recovery from a cyclone event for the Port of Townsville.	Medium (Unlikely / Serious)
	Severe/extreme weather results in loss of contaminants and sediment to the marine environment	Sensitive Receptors of Cleveland Bay		Where possible, key construction activities to be planned to commence and be mostly completed in dry seasons where risk of severe weather is reduced.	
	Damage to the constructed rockwall can result in release of dredge material to the marine environment.			Reclamation integrity plan incorporates severe weather contingency arrangements to minimise impact.	
	Severe/extreme weather results in reduced resilience in the coral/seagrass community in Cleveland Bay			<p>Key construction fronts designed to accommodate and withstand standard severe weather events.</p> <p>Experienced contractors engaged to deliver the key construction fronts.</p> <p>The Port's Cyclone Response Plan enacted to ensure all Port staff are safe and equipment removed where practical prior to extreme events.</p>	

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Element	Impacting Process/ Potential Impact	Risk Receptor	Raw Likelihood / Consequence	Mitigation Measures	Residual Risk
	Severe/extreme weather events impacting upon Port /contractors /monitoring consultants and equipment – significantly delaying deliverables.	Port employees, Port contractors, Port monitoring consultants		Contingency monitoring events for sensitive receptors (seagrass/ coral)  CU Environmental staff (Manager and Advisors) remain across all monitoring programs to ensure continuation of programs in the absence of a staff member.	
Pandemic outbreak (e.g. Covid 19)	Management controls not delivered due to lack of access to site/ personnel movement controlled.  Environmental impacts occur due to incomplete delivery of project and controls.	Port employees, Port contractors, Port monitoring consultants  Sensitive receptors of Cleveland Bay	Likely / Serious (Medium)	The Port will engage experienced contractors to deliver the key construction fronts, with locally based staff during works.  Contractors develop Covid 19 response plans to provide contingency and continuity should border restrictions apply.  Implementation of key monitoring programs of sensitive receptors to monitor for any potential environmental impacts from the project.	Low (Rare/Serious)
	Monitoring program not conducted due to failure to be able to access site/personnel movement controlled	Sensitive receptors of Cleveland Bay	Likely / Serious (Medium)	Contractors develop Covid 19 response plans to provide contingency and continuity should border restrictions apply.  Detailed contract management process for key monitoring programs to ensure delivery of the program and identification of any limitations early.  CU Environmental staff (Manager and Advisors) remain across all monitoring programs to ensure continuation of programs in the absence of a staff member.	Low (Rare/Serious)
	Breach of approval condition	Compliance record/ Public reputation	Likely / Serious (Medium)	Annual compliance review against approval conditions and approved documents (Management Plans etc) will be undertaken to demonstrate compliance.  Dedicated environmental resources on the Project, by contractors and Port.	Low (Rare/Serious)

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Element	Impacting Process/ Potential Impact	Risk Receptor	Raw Likelihood / Consequence	Mitigation Measures	Residual Risk
				Oversight by Port, ITAC and Project regulatory committee	

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## 4 ROCK WALL CONSTRUCTION OFFSETS

The PEP EIS/AEIS identified project related risks and potential impacts to both seagrass and listed dolphin species associated with the construction of the reclamation area rock wall. The following sections (4.1, 4.3 and 4.3) discuss the residual risks, method of offset (or offset approach), determination of residual risk and offset need associated with fine sediment, seagrass, and listed dolphin species, as well as the Port's offset commitments.

### 4.1 Fine Sediment Offsets

#### 4.1.1 Residual Risks

The PEP EIS/AEIS did not predict a residual risk for fine sediments for the construction of the rock wall.

#### 4.1.2 Offset Commitments

Fine Sediment	Reclamation Area
<b>Offset Requirement</b>	<p><b>Condition 27d</b> details of how the person taking the action will achieve a reduction of sediment entering the marine environment from the Burdekin, Ross and Black river basins, based on the amount of fine sediment determined in Dredging Completion Reports required under Condition 26(b)(i);</p> <p><b>Condition 27b</b> details on how the person taking the action will achieve a reduction of sediment entering the marine environment from the Burdekin, Ross and Black river basins, if monitoring undertaken in accordance with condition 50) identifies actual lethal or sub-lethal impacts on sensitive habitat sites, including seagrasses or corals. The sediment offset must be based on the amount of fine sediment that was available for resuspension before commencement of the relevant stage of the action, as determined in Dredging Completion Reports required under Condition 26(b)(ii);</p>
<b>Offset Calculation</b>	<p>As per conditional requirements (listed above), no fine sediment offset was required for rockwall construction activities.</p> <p>Fine sediment offset methodology and details for dredging are provided in section 5.1.</p>
<b>Offset Method</b>	Not relevant as no fine sediment offset required for rockwall construction.
<b>Reef 2050 long term sustainability plan</b>	Not relevant as no fine sediment offset required for rockwall construction.
<b>Determination of Offset need</b>	<p>As per conditional requirements (listed above), no fine sediment offset requirement for rockwall construction activities.</p> <p>Fine sediment offset methodology and details for dredging are provided in section 5.1.</p>
<b>Offset outcome</b>	Not relevant as no fine sediment offset required for rockwall construction.
<b>Delivery</b>	Not relevant as no fine sediment offset required for rockwall construction.
<b>Verification of offset</b>	Not relevant as no fine sediment offset required for rockwall construction.
<b>Reporting</b>	Not relevant as no fine sediment offset required for rockwall construction.

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## 4.2 Seagrass Offsets

### 4.2.1 Residual Risks

The PEP EIS/AEIS predicted the residual risks listed in Table 3 relating to the loss of seagrasses associated with the CU Project's construction and reclamation activities.

Table 3: Residual Risks Associated with Seagrasses from Rock Wall Construction

Activity	Risk(s)
Reclamation (direct impact – loss of habitat)	<p>A permanent, irreversible impact will occur as a result of the construction of the CU reclamation structure if seagrasses are present in the footprint of this area.</p> <p>No seagrass communities have been observed within the footprint as part of current monitoring or historically.</p>

Overall, the residual risk rating for seagrass is classified as negligible, given the historical surveying of the CU Project reclamation area has identified a lack of seagrass in the area.

### 4.2.2 Offset Commitments

Loss of seagrass within the reclamation footprint	Reclamation Area
<b>Offset Requirement</b>	<b>Condition 27d.</b> <i>If seagrasses are identified in the dredge footprint or reclamation area from surveys undertaken in accordance with Conditions 3 and 9, details of how the person taking the action will compensate for the loss of seagrasses within the dredge and reclamation footprints, taking account of the density of seagrass coverage</i>
<b>Offset Calculation</b>	Calculation of the required offsets would be via the established Queensland Government offsets calculator <a href="https://apps.des.qld.gov.au/offsets-calculator/">https://apps.des.qld.gov.au/offsets-calculator/</a> . This calculator is based on the total cover to be disturbed and will be informed by the seagrass survey of the footprint area.
<b>Offset Method</b>	<p>Offsets are able to be provided for by way of Financial settlement, or proponent driven offset (on-ground works) or a combination of both. Method of delivery would need to be resolved with Queensland Government and would be informed by the quantum.</p> <p>Strong preference would be that any offsets would be implemented within the GBRWHA where possible.</p> <p>Offsets are verified by Queensland Government prior to the offset being discharged.</p>
<b>Reef 2050 long term sustainability plan</b>	<p>Work in this will contribute to the following Reef 2050 actions</p> <ul style="list-style-type: none"> <li>- EHA23 Implement coastal planning laws based on the best available science, which take into account expected sea level rise, protect ecologically significant areas such as wetlands, prohibit new development in high-hazard greenfield areas and protect the Great Barrier Reef World Heritage Area.</li> <li>- EHA29 (MTR GA4) Establish condition and resilience indicators for coral reefs, seagrass, islands, estuaries, shoals and inter-reefal shelf habitats.</li> </ul>

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<b>Determination of Offset need</b>	<p>A seagrass survey of the reclamation footprint (Rock wall and reclamation area - approx. 62Ha) was undertaken in October 2018 (to meet Condition 9 of EPBC Approval No. 2011/5979). No seagrasses were identified in the reclamation footprint during this survey.</p> <p>This survey was undertaken by James Cook University TropWATER, one of the leading Australian consultants for seagrass monitoring hence high confidence in the results. Report provided to DAWE (30/9/2019).</p>
<b>Offset outcome</b>	No offset required for seagrass in the 62Ha reclamation area as no seagrasses are present
<b>Delivery</b>	Not relevant as no offset required for reclamation area
<b>Verification of offset</b>	Not relevant as no offset required for reclamation area
<b>Reporting</b>	<p>Copy of survey report provided to DAWE (30/9/2019).</p> <p>Will be captured in annual reviews of the performance of the OMS and submitted to the Department and published on the website (in line with condition 27 (f))</p>

## 4.3 Listed Dolphins Offsets

### 4.3.1 Residual Risks

The PEP EIS/AEIS predicted the residual risks listed in Table 4 relating to listed dolphins, namely the Australian snubfin dolphin (*Orcaella heinsohni*) and the Australian humpback dolphin (*Sousa sahulensis*), associated with the CU Project's construction and reclamation activities.

Table 4: Residual Risks Associated with Listed Dolphins from Rock Wall Construction

Activity	Risk(s)
Marine construction activities (direct impact – loss of food resources and habitat)	<p>The construction of the CU reclamation structure will result in the permanent localised loss of approximately 62 hectares of unvegetated soft benthic substrate, including covering existing rock walls with capital dredge material and constructing new longer walls. The general habitats in the footprint of the seabed being reclaimed are characterised as having low to moderate biodiversity values but are contained within the core habitat area of the Australian snubfin and other coastal dolphin species. They represent locally important foraging areas for both listed species, particularly around the rock walls where fish and other aquatic life dwell. The habitat types (sediment types, hydrodynamics, depths, water quality) and benthic communities present in the area are similar throughout the nearshore environments of the wider port area and are not known or likely to contain unique feeding resources or functional values.</p> <p>Construction and reclamation activities will result in potential interest from dolphins due to their inquisitive nature and because the construction works will attract smaller fish in turn attracting dolphins. During the CU Project, these species are assumed to continue to use the existing habitats throughout Cleveland Bay; their known core use area west of Cape Pallarenda; and elsewhere in the broader home range (i.e. outside the Townsville region). It is also expected that they will frequent the areas near construction (as experienced in previous marine construction projects in Cleveland Bay). As discussed in the EIS, both species are opportunistic foragers and have wide home ranges.</p> <p>Following completion of the CU Project, it is expected they will continue to visit the new reclamation structure, based on current usage patterns in the Port.</p>

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Activity	Risk(s)
Noise and vibration	<p>The increase in noise during the rock wall construction phase may lead to listed dolphins temporarily avoiding affected areas. Both dolphin species use sound for navigation, feeding and avoiding predators (through echo location) and also for communication. Construction works are expected to generate noise that may impact the ability of dolphins to communicate, navigate and echo locate by sound. During the construction period, nearshore dolphins may avoid the CU reclamation footprint at times when noisy, or otherwise disturbing, activities are underway (e.g. limited pile driving). This will lead to the displacement of these species in waters directly adjacent to the site during this phase of the Project. However it is expected these species will move to one of their other habitats within their broader home range during potentially noisy activities associated with rock wall construction.</p> <p>Noise disturbance will be temporary and intermittent throughout the CU Project.</p>
Leaks and spills	There will be the potential for hydrocarbon or other contaminant spill from vessels, plant or on-site facilities, potentially leading to direct effects to listed dolphins or their prey during the rock wall construction phase.
Waste management	A potential increase in rubbish production during the rock wall construction phase may increase the risk of entanglement and/or ingestion of marine debris by listed dolphins.
Physical presence of marine infrastructure	<p>During the rock wall construction phase, the listed dolphins may be temporarily and intermittently displaced from the area adjacent to the CU reclamation structure. However, the intensity, scale, magnitude and duration of this impact are not expected to preclude their use and transiting of the area during the construction phase and will not preclude future use of the habitat (direct reclamation footprint excluded) once works are completed.</p> <p>Based on observations of dolphins within and adjacent to existing berth and breakwater areas (GHD, 2011 &amp; 2012), it is expected that the dolphins will use waters in the vicinity of the new CU reclamation structure in the same manner as the existing the Port breakwaters and return to forage once construction has been completed.</p> <p>Dolphins will need to swim a slightly greater distance around the CU reclamation area to move between the feeding areas at the Ross River and Ross Creek mouths. No significant impacts to broad-scale movements are expected (i.e. to and from the wider Cleveland Bay, seagrass meadows, or core area west of Cape Pallarenda). The rock wall construction phase will not fragment the local populations of these species, nor pose ecologically significant impediments.</p> <p>Based on the monitoring data and observations undertaken by GHD and the Port (GHD 2011, 2012), the species appear to be able to successfully co-exist with the existing port (activities and infrastructure) and to accommodate the impacts of major expansion projects including the Eastern Reclamation, TPIX and Marine Precinct. To this end, there is anecdotal information that the dolphins will also preferentially use the artificial rock wall habitat from time to time to augment their</p>

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	feeding habitat and will also seek respite/resting opportunities in the more confined waters within the breakwaters or dredged channels.

In summary, the loss of food resources and habitat, the noise-related activities and potential hydrocarbon/contaminant spills were predicted to pose a medium residual risk to the Australian Snubfin dolphin and the Indo-Pacific Humpback dolphin following the implementation of mitigation measures as detailed in the Marine Environment Management Plan (POT 2135).

#### 4.3.2 Offsets Commitments

Impacts to listed dolphin species	Reclamation area
<b>Offset Requirement</b>	<b>Condition 27c.</b> <i>If residual impacts to listed dolphin species in Cleveland Bay from the proposed action are identified through monitoring undertaken in accordance with Condition 24, details of how the person taking the action will compensate for the residual impacts to listed dolphin species;</i>
<b>Offset Calculation</b>	<p>A key limitation in relation to the Inshore Dolphin Monitoring Program and offsets is having statistical power in the population and behavioural data collected to detect any impact, other than catastrophic impact. Given the mobility of marine mammals and the small populations within the survey area, there is the real possibility that the dolphin monitoring will be limited in its ability to detect impact with any statistical robustness. Further to this limitation, given the complexity of ecological and environmental variability in marine ecosystems, separating the effects of human activities on coastal inshore dolphins from natural ecological and environmental variability, or project impacts from non-project impacts, will be difficult.</p> <p>This limitation in the ability to detect impact has been highlighted by the contractor undertaking the dolphin monitoring and confirmed by the CU Project ITAC megafauna specialist. The ITAC also noted that given the limited knowledge and understanding of the species in Cleveland Bay, the monitoring program will provide a significant science benefit in terms of building on the scientific knowledge of the species in Cleveland and Halifax Bay.</p> <p>Residual impact to listed dolphin species will be determined through the Inshore Dolphin Monitoring Plan (IDMP) in close consultation with the ITAC and DAWE.</p> <p>The Inshore Dolphin Monitoring Plan was developed with an awareness of the above limitations and includes the following to address these limitations:</p> <ul style="list-style-type: none"> <li>• A design that addresses mobility of populations by the inclusion of the primary site (Cleveland Bay) and adjacent bays to the north and south (where able to be accessed). This will assist in distinguishing movements between sites and temporary emigration between primary samples, from demographic changes in Cleveland Bay that otherwise might be attributed to other factors (i.e., decrease in survival);</li> <li>• Alignment of the surveys to be conducted at the same time every year. This will remove the confounding effect of ecological and environmental/seasonal variability;</li> <li>• A design that has been developed with the intention of assessing abundance estimates with a high level of precision (CV ~0.1); and</li> </ul>

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	<ul style="list-style-type: none"> <li>Selection of highly experienced contractors, with a highly qualified, multidisciplinary team that includes two of the three leading experts in Australia.</li> </ul>
<b>Offset Method</b>	<p>Marine offsets are not as mature as terrestrial offsets with little available literature on primary offsets applied for addressing residual impacts on dolphin species, or any standardised calculation approach for determining a suitable offset.</p> <p>As such the methodologies for calculating and implementing marine offsets is less certain. Particularly for actions that are a direct benefit to the species/habitat of inshore dolphins. Direct offsets are more preferable to indirect offsets however where there are known gaps in dolphin habitat protection, an indirect offset may be viable if it has direct linkage from pathway to impact.</p> <p>If an impact is detected through implementing the IDMP, the Port will undertake the following:</p> <ul style="list-style-type: none"> <li>- Notify ITAC and regulators</li> <li>- Undertake consultation to identify suitable options for offsetting (consultation will be with relevant experts, ITAC and Regulators). Including defining clear objectives to ensure the process is suitably targeted, noting a direct linkage to impact;</li> <li>- With 3 months of notification formally provide options to the Department for approval for offset projects that align with the above objectives;</li> <li>- Following option approval prepare a project plan for dolphin offset delivery and submit for approval (note this may be a standalone plan or incorporated within the OMS)</li> <li>- the Port to implement the approved project plan</li> </ul>
<b>Reef 2050 long term sustainability plan</b>	<p>Offsets (if required) will contribute to one or more of the following Reef 2050 actions: BA12, BA15 and EBA6 (c), with priority to further;</p> <ul style="list-style-type: none"> <li>- improving the management of key habitat for inshore dolphins;</li> <li>- reducing cumulative impacts on coastal dolphin populations and their supporting habitats especially Australian humpback and snubfin dolphins;</li> <li>- research, and implementing improved measures, to reduce cumulative impacts to listed dolphins from shipping.</li> </ul>
<b>Determination of Offset need</b>	Offset will be required if an impact is determined as a result of implementing the approved Inshore Dolphin Monitoring Plan.
<b>Offset outcome</b>	To be determined on the basis of impacts detected implementing the approved Inshore Dolphin Monitoring Plan.
<b>Delivery</b>	To be developed as part of a dolphin offset project plan, if needed.
<b>Verification of offset</b>	To be developed as part of a dolphin offset project plan, if needed.
<b>Reporting</b>	<p>Will be captured in annual reviews of the performance of the OMS and submitted to the Department and published on the website (in line with condition 27 (f))</p> <p>Reported to the Department if the Inshore Dolphin Monitoring Plan identifies an residual significant impact.</p>

**4.3.3 Limitation – Ability to detect impact**

This limitation in the ability to detect impact has been highlighted by the contractor undertaking the dolphin monitoring and confirmed by the CU Project ITAC megafauna specialist. The ITAC also noted that given the limited knowledge and understanding of the species in Cleveland Bay, the monitoring program will provide a significant science benefit in terms of building on the scientific knowledge of the species in Cleveland and Halifax Bay.

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## 5 DREDGING AND BREAKWATER OFFSETS

The PEP EIS/AEIS identified project related risks and potential impacts associated with fine sediment releases, seagrass and listed dolphin species associated with the capital dredging, including impacts to seagrass and listed dolphin species from the diagonal breakwater construction. Similarly, impacts to seagrass and listed dolphin species could also occur as a result of constructing the temporary offloading facility. The following sections (5.1, 5.2 and 5.3) discuss the residual risks, method of offset (or offset approach), determination of residual risk and offset need associated with fine sediment, seagrass, and listed dolphin species, as well as the Port's offset commitments.

### 5.1 Fine Sediment Offsets

#### 5.1.1 Residual Risks

The PEP EIS/AEIS predicted the release of fine sediments as part of dredging activities. In preparing the EIS/AEIS a number of scenarios were considered, based on a different combination of dredging plant. The adopted scenario for impact assessment in the EIS/AEIS was the use of a small trailing suction hopper dredge (TSHD) to dredge 1.5 million m<sup>3</sup> of soft marine sediments and dense clayey sands and a backhoe dredge (BHD) to dredge the balance, consisting of 2.4 million m<sup>3</sup> of stiff, very stiff and hard clays. This scenario shows sediment releases across the dredging footprint, with the greatest concentrations occurring at the outer end of Platypus Channel and along the Sea Channel near Magnetic Island.

Subsequently to the EIS/AEIS, it has now been confirmed that all dredging as part of the CU Project will be undertaken by BHD. This scenario was considered in the EIS/AEIS however was not presented as it was shown to cause significantly less release of sediment comparative to the adopted, more conservative scenario. Remodelling of this scenario has been undertaken which will support the prediction and validation of fine sediment releases for impact assessment and offset purposes. This modelling shows significantly reduced zones of impact and influence compared to that presented in the AEIS/EIS through the use of BHD only (no TSHD).

The release of fine sediment has the potential to cause lethal and sub-lethal impacts to sensitive receptors such as seagrass meadows and coral reefs. This includes impacts associated with reduction of light penetration and those resulting from deposition and smothering. Impacts to these receptors reduces foraging and refuge habitat for fauna. Due to the reduced zone of influence one seagrass location (part of a larger meadow) is predicted to be within the zone of influence only, no sensitive habitats are with any zones of impact.

#### 5.1.2 Offset Commitments

Fine Sediment	Capital Dredging
<b>Offset Requirement</b>	<p><b>Condition 27d</b> details of how the person taking the action will achieve a reduction of sediment entering the marine environment from the Burdekin, Ross and Black river basins, based on the amount of fine sediment determined in Dredging Completion Reports required under Condition 26(b)(i);</p> <p><b>Condition 27b</b> details on how the person taking the action will achieve a reduction of sediment entering the marine environment from the Burdekin, Ross and Black river basins, if monitoring undertaken in accordance with condition 50) identifies actual lethal or sub-lethal impacts on sensitive habitat sites, including seagrasses or corals. The sediment offset must be based on the amount of fine sediment that was available for resuspension before commencement of the relevant stage of the</p>

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	<i>action, as determined in Dredging Completion Reports required under Condition 26(b)(ii);</i>
<b>Offset Calculation</b>	<p>As required by the conditions of the EPBC approval, a method for defining, delineating and quantifying the volume of fine sediment returned to the marine environment during capital dredging has been developed.</p> <p>The Port engaged the services of consultants with expertise in hydrodynamic/numerical modelling, geotechnical assessment and practical knowledge of dredging practices to support the development of the methodology for fine sediment calculation. The methodology proposed includes the delineation between seabed material that is and is not available for re-suspension and understanding of behaviour of materials dredged utilising different dredging techniques.</p> <p>A detailed desktop assessment was undertaken to develop a conservative initial estimate of fine sediment (&lt;15.6 µm silt / clay) that may be released as a result of proposed dredging. To develop the initial estimates of the fine sediment that may be released to the environment the assessment considered:</p> <ul style="list-style-type: none"> <li>- Incorporation of geotechnical data which provided both a summary of the ground profile and the dredge material characteristics;</li> <li>- information on the planned dredge methodology, including the mechanisms of sediment release from dredging operations; and</li> <li>- a comprehensive literature review related to fine sediment source term factors (i.e. loss rates or suspension rates) due to mechanical dredging processes.</li> </ul> <p>During dredging a range of validation activities will be undertaken in the field targeting the quantification of dredge plume fine sediment release rates. Including</p> <ul style="list-style-type: none"> <li>- ADCP - This is the primary means of measuring sediment concentration and sediment flux within the plume.</li> <li>- Optical Sensor - Concurrent optical sensor profile measurements will be undertaken using LISST and OBS instruments. The boat would be stationary during profiling for practical reasons.</li> <li>- Water Sampling - A large number of water samples will be collected on each of the field trips at a variety of depths and locations using a pump sampler.</li> </ul> <p>These validation activities are based on the literature review and experience from undertaking similar monitoring programs for the Cairns Shipping Development Project and Gladstone Clinton Vessel Interaction Project. Validation will include Vessel based dredge plume transecting.</p> <p>The vessel-based plume monitoring will primarily target the sampling of cross-sections through the dredge plume at transects positioned down current of the dredge equipment. Sampling will be undertaken for a range of different distances downstream of the dredge and where possible the cross-sections would start and finish outside the plume extent.</p> <p>In addition the following validation activities will be undertaken to capture and quantify all aspects of release</p>

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	<ul style="list-style-type: none"> <li>- Tailwater Discharge - Continuous measurements of tailwater discharge and turbidity during active tailwater discharge operations. These continuous measurements would be supplemented by regular collection of water samples for calibrating NTU to TSS conversion and analysing PSD.</li> <li>- Numerical Hindcast Modelling - The numerical modelling is used to assess the likely dredge plume source rate by comparing modelled TSS and suspended sediment flux to each measured transect TSS and sediment flux.</li> </ul> <p>The use of remote sensing (satellite imagery) data provides a supplementary means of validating the dredge plume hindcast model predictions. In particular, the satellite imagery will capture the spatial extents of the dredge plume at a snapshot in time and can be directly compared with spatial maps derived from the hindcast model predictions. This assessment has developed a conservative initial estimate of fine sediment (&lt;15.6 µm silt / clay) that may be released as a result of proposed dredging and will be refined via a range of in field validation practices to calculate the estimated volume of fine sediment:</p> <ul style="list-style-type: none"> <li>- determined in Dredging Completion Reports required under Condition 26(b)(i); and</li> <li>- that was available for resuspension before commencement of the relevant <b>stage</b> of the action, as determined in Dredging Completion Reports required under Condition 26(b)(ii);</li> <li>- which will form the basis of the offset amount required for the release of fine sediment to the marine environment.</li> </ul> <p>This methodology has been independently peer reviewed by Alistar Grinham (University of Queensland) .</p> <p>Baseline assessments of the condition of seagrass and coral communities have been undertaken and will continue to be conducted through the CU Project Seagrass and Coral Monitoring Programs. Both of these programs involve multi-year monitoring programs across a number of impact and reference sites in order to identify whether actual lethal or sub-lethal impacts on sensitive habitat sites, including seagrasses or corals, have occurred as a result of the Project.</p> <p>Where such impacts are determined, as per condition 27b of EPBC Approval No. 2011/5979, the fine sediment methodology will be used to determine the volume of fine sediment to be offset via reduction of sediment entering the marine environment for the Burdekin, Ross and Black River systems.</p>
<b>Offset Method</b>	<p>Offsets are able to be provided for via Reef Trust or through directly supporting a reduction of sediment entering the marine environment from the Burdekin, Ross and Black river basins.</p> <p>The Port will preferentially offset fine sediment through achieving a reduction of sediment entering the marine environment from the Burdekin, Ross and Black River basins as this is within the Port's local region. The Burdekin catchment is the largest contributor of anthropogenic fine sediment loads of the 35 catchments that drain to the GBR.</p> <p>Offsets would be aligned to the existing prioritisation matrix that has been developed by the NRM groups to ensure efficient and cost-effective delivery of sediment outcomes. Work in this catchment would contribute significantly to implementing the Burdekin Water Quality Improvement Plan.</p>

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	Currently there are a range of project delivery options that are known to provide a measurable sediment reduction outcome that will achieve the Port's sediment reduction needs. These options are large scale gully remediation; improved grazing land management; and stream bank erosion.
<b>Reef 2050 long term sustainability plan</b>	<p>As outlined above it is proposed to utilise Paddock to Reef which is a centralised point for measuring and reporting on progress towards the goal and targets in the Australian Government's Great Barrier Reef 2050 Long-term Sustainability Plan. As Paddock to Reef is funded jointly by the Australian and Queensland governments to collect and integrate data and information on agricultural management practices, catchment indicators, catchment loads and the health of the GBR this strongly aligns with the Reef 2050 long term sustainability plan.</p> <p>Work in this will contribute to the following Reef 2050 actions</p> <ul style="list-style-type: none"> <li>- MTR WQA1 Implement the Reef 2050 Water Quality Improvement Plan 2010-2022 (Note this Action encompasses the following updated action: - <ul style="list-style-type: none"> <li>o WQA7 Finalise and implement plans (e.g. Water Quality Improvement Plans and Healthy Waters Management Plans) for Reef catchments and key coastal areas, identifying implementation priorities for protection of the Reef.</li> <li>o WQA8 Increase industry participation in regional water quality improvement initiatives and partnerships aimed at managing, monitoring and reporting of water quality.</li> <li>o WQA2 Continue improvement in water quality from broadscale land use through implementation of Reef Water Quality Protection Plan 2013 actions.</li> </ul> </li> <li>- EHA6 (MTR GA4) Further develop regionally relevant standards for ecosystem health (desired state, critical thresholds and health indicators) that inform and support the Integrated Monitoring and Reporting Program.</li> <li>- EHA7 Prioritise functional ecosystems critical to Reef health in each region for their protection, restoration and management.</li> <li>- EHA20 Strengthen the Queensland Government's vegetation management legislation to protect remnant and high value regrowth native vegetation, including in riparian zones.</li> </ul>
<b>Determination of Offset need</b>	<p>A Dredging Completion Report is to be developed at the completion of capital dredging for each stage of the Action (Condition 26).</p> <p>This dredging completion report will quantify the total amount of material dredged and will inform the total fine sediment released calculation, based on the quantification methodology developed.</p>
<b>Offset outcome</b>	Net benefit to the outstanding universal value of the GBRWHA through a reduction in volume of sediment entering the marine environment from the Burdekin, Ross and Black river basins.
<b>Delivery</b>	The Port will preferentially offset fine sediment through achieving a reduction of sediment entering the marine environment from the Burdekin, Ross and Black river basins as this is within the local region particularly as the Burdekin catchment is the largest contributor of anthropogenic fine sediment loads of the 35 catchments that drain to the GBR.

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	<p>We have commenced discussions with local natural resource management groups, and are now progressing formalising arrangements as we have an indication of the amounts of fine sediment that would need to be offset (based on the offset calculation applied and peer reviewed – see details above).</p> <p>If for any reason we are unable to reach agreement we are able to contribute via Reef Trust as per condition 28.</p>
<b>Verification of offset</b>	The Paddock to Reef (P2R) Integrated Monitoring, Modelling and Reporting Program (Paddock to Reef program) will be utilised to monitor, model and evaluate the delivery of sediment outcomes.
<b>Reporting</b>	<p>Will be captured in annual reviews of the performance of the OMS and submitted to the Department and published on the website (in line with condition 27 (f))</p> <p>A Dredging Completion Report is to be developed at the completion of capital dredging for each stage of the Action (Condition 26).</p>

## 5.2 Seagrass Offsets

### 5.2.1 Residual Risks

The PEP EIS/AEIS predicted the residual risks listed in Table 5 relating to the loss of seagrasses associated with the CU Project's capital dredging and Diagonal Breakwater construction.

**Table 5: Residual Risks Associated with Seagrasses from Capital Dredging**

Activity	Risk(s)
Dredging of port area and navigation channels (Stage 1 – widening)	<p>A permanent, irreversible impact will occur as a result of capital dredging and diagonal breakwater construction works where seagrasses are present in the footprint of these areas.</p> <p>A medium term sub-lethal impact will occur as a result of capital dredging works if the dredging Zone of Low Impact overlaps with seagrass areas.</p> <p>No seagrass communities were observed within the footprint or Zone of Low Impact as part of EIS/AEIS monitoring but were known to have occurred historically.</p>

Since the completion of the EIS/AEIS, seagrass monitoring has continued, with the most recent report prepared in October 2020. Specific surveys were undertaken to assess seagrass in the dredging and breakwater footprint (April 2020 for the breakwater realignment, and Oct 2020 for the full dredge footprint). The seagrass extent based on this mapping are shown in Figure 7 and Figure 8. Based on this mapping, up to 1.46 ha of seagrass habitat is expected to be impacted by the dredging, weighted based on cover.

A separate assessment was completed on 7 May 2021 of seagrass presence within the footprint of the Temporary Unloading Facility (TUF). No seagrass communities were observed within the TUF footprint as part of current monitoring or historically.

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Figure 7: Seagrass Extent 2020 in CU Project Area, October 2020 (Smith and Rasheed, 2020)



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Figure 8: Seagrass Extent 2020 at Diagonal Breakwater footprint, April 2020 (Chartrand and Wilkinson, 2020)





## 5.2.2 Offset Commitments

Loss of seagrass within the dredging footprint	Capital Dredging
Offset Requirement	<i><b>Condition 27d.</b> If seagrasses are identified in the <b>dredge footprint</b> or reclamation area from surveys undertaken in accordance with Conditions 3 and 9, details of how the person taking the action will compensate for the loss of seagrasses within the <b>dredge</b> and reclamation <b>footprints</b>, taking account of the density of seagrass coverage</i>
Offset Calculation	Calculation of the required offsets would be via the established Queensland Government offsets calculator <a href="https://apps.des.qld.gov.au/offsets-calculator/">https://apps.des.qld.gov.au/offsets-calculator/</a> . This calculator is based on the total cover to be disturbed and will be 1.46 ha based on the seagrass survey of the various footprint areas.
Offset Method	Offsets will be delivered as a financial offset, with money provided by the Port to the Queensland Department of Environment and Science based on the quantum of impact. To determine the financial offset, the Queensland Government financial settlement offset calculator will be used. The impact area used for the calculator will be based on the total footprint of seagrass impacts proportioned based on the seagrass density within this footprint (1.46 ha of seagrass habitat is expected to be impacted by the dredging).
Reef 2050 long term sustainability plan	Work in this will contribute to the following Reef 2050 actions <ul style="list-style-type: none"> <li>- EHA23 Implement coastal planning laws based on the best available science, which take into account expected sea level rise, protect ecologically significant areas such as wetlands, prohibit new development in high-hazard greenfield areas and protect the Great Barrier Reef World Heritage Area.</li> <li>- EHA29 (MTR GA4) Establish condition and resilience indicators for coral reefs, seagrass, islands, estuaries, shoals and inter-reefal shelf habitats.</li> </ul>
Determination of Offset need	A seagrass survey of the dredging and breakwater footprints was undertaken in April 2020 and October 2020 (compliant with Condition 9 of EPBC Approval No. 2011/5979). Seagrass was identified as present immediately adjacent to the western and offshore breakwater, partly within the dredging footprint and the diagonal breakwater alignment. A survey of seagrass presence within the footprint of the TUF undertaken on XX showed no seagrass communities within the TUF footprint.  These surveys were undertaken by James Cook University TropWATER, one of the leading Australian consultants for seagrass monitoring hence high confidence in the results.
Offset outcome	Based on the density of the seagrass compared to cover, the total seagrass loss is calculated as 1.46 ha.
Delivery	Offsets will be provided by way of financial settlement. This will be paid to the Queensland Department of Environment and Science.
Verification of offset	Once the financial settlement has been paid, the offset will be deemed delivered.
Reporting	Reporting of the performance of the OMS will be captured in annual reviews and submitted to the Department and published on the website (in line with condition 27 (f)).  DAWE will be notified when financial offset has been paid

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### 5.3 Listed Dolphins Offsets

#### 5.3.1 Residual Risks

The PEP EIS/AEIS predicted the residual risks listed in Table 6 relating to listed dolphins, namely the Australian snubfin dolphin (*Orcaella heinsohni*) and the Australian humpback dolphin (*Sousa sahulensis*), associated with the CU Project’s capital dredging, diagonal breakwater realignment and construction of the temporary offloading facility.

Table 6: Residual Risks Associated with Listed Dolphins from Capital Dredging and diagonal breakwater realignment

Activity	Risk(s)
Marine construction activities (direct impact – loss of food resources and habitat)	<p>The capital dredging and construction works for the diagonal breakwater realignment will lead to a short-term temporary loss of seagrass meadow and soft sediment habitats. These general habitats are characterised as having low to moderate biodiversity values but are contained within the core habitat area of the Australian snubfin and other coastal dolphin species. They represent locally important foraging areas for both listed species, particularly around the rock walls where fish and other aquatic life dwell. The habitat types (sediment types, hydrodynamics, depths, water quality) and benthic communities present in the area are similar throughout the nearshore environments of the wider port area and are not known or likely to contain unique feeding resources or functional values.</p> <p>Construction and dredging activities is likely to result in potential interest from dolphins due to their inquisitive nature and because the works will attract smaller fish in turn attracting dolphins. During the CU Project, these species are assumed to continue to use the existing habitats throughout Cleveland Bay; their known core use area west of Cape Pallarenda; and elsewhere in the broader home range (i.e. outside the Townsville region). It is also expected that they will frequent the areas near construction (as experienced in previous marine construction projects in Cleveland Bay). As discussed in the EIS, both species are opportunistic foragers and have wide home ranges.</p> <p>Following completion of the CU Project, it is expected they will continue to visit the new structures, based on current usage patterns in the Port.</p>
Noise and vibration	<p>The increase in noise during the dredging and construction works may lead to listed dolphins temporarily avoiding affected areas. Both dolphin species use sound for navigation, feeding and avoiding predators (through echo location) and also for communication. Construction works, especially piling associated with the temporary offloading facility, are expected to generate noise that may impact the ability of dolphins to communicate, navigate and echo locate by sound. During the construction period, nearshore dolphins may avoid the dredging and construction footprints at times when noisy, or otherwise disturbing, activities are underway (e.g. limited pile driving). This will lead to the displacement of these species in waters directly adjacent to the site during this phase of the Project. However, it is expected these species will move to one of their other habitats within their broader home range during potentially noisy activities associated with dredging or construction activities.</p> <p>Noise disturbance, including piling, will be temporary and intermittent throughout the CU Project and a range of management controls are in place via the MEMP.</p>

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Activity	Risk(s)
Leaks and spills	There will be the potential for hydrocarbon or other contaminant spill from vessels, plant or on-site facilities, potentially leading to direct effects to listed dolphins or their prey during the dredging and construction activities.
Waste management	A potential increase in rubbish production during the dredging and construction activities may increase the risk of entanglement and/or ingestion of marine debris by listed dolphins.
Physical presence of marine infrastructure	<p>During the breakwater and temporary offloading facility construction, the listed dolphins may be temporarily and intermittently displaced from the area adjacent to the structures. However, the intensity, scale, magnitude and duration of this impact are not expected to preclude their use and transiting of the area during the construction phase and will not preclude future use of the habitat (direct structure footprint excluded) once works are completed.</p> <p>Based on observations of dolphins within and adjacent to existing berth and breakwater areas (GHD, 2011 &amp; 2012; Parra et al 2019 &amp; 2020), it is expected that the dolphins will use waters in the vicinity of the new CU structures in the same manner as the existing Port breakwaters and return to forage once construction has been completed.</p> <p>No significant impacts to broad-scale movements are expected (i.e. to and from the wider Cleveland Bay, seagrass meadows, or core area west of Cape Pallarenda). The dredging and construction activities will not fragment the local populations of these species, nor pose ecologically significant impediments.</p> <p>Based on the monitoring data and observations undertaken by GHD and the Port (GHD 2011, 2012), the species appear to be able to successfully co-exist with the existing port (activities and infrastructure) and to accommodate the impacts of major expansion projects including the Eastern Reclamation, TPIX and Marine Precinct. To this end, there is anecdotal information that the dolphins will also preferentially use the artificial rock wall habitat from time to time to augment their feeding habitat and will also seek respite/resting opportunities in the more confined waters within the breakwaters or dredged channels.</p>

In summary, the loss of food resources and habitat, the noise-related activities and potential hydrocarbon/contaminant spills were predicted to pose a medium residual risk to the Australian Snubfin dolphin and the Australian Humpback dolphin following the implementation of mitigation measures as detailed in the Marine Environment Management Plan (POT 2135).

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## 5.3.2 Offsets Commitments

Impacts to listed dolphin species	Reclamation area
<b>Offset Requirement</b>	<b>Condition 27c.</b> <i>If residual impacts to listed dolphin species in Cleveland Bay from the proposed action are identified through monitoring undertaken in accordance with Condition 24, details of how the person taking the action will compensate for the residual impacts to listed dolphin species;</i>
<b>Offset Calculation</b>	<p>A key limitation in relation to the Inshore Dolphin Monitoring Program and offsets is having statistical power in the population and behavioural data collected to detect any impact, other than catastrophic impact. Given the mobility of marine mammals and the small populations within the survey area, there is the real possibility that the dolphin monitoring will be limited in its ability to detect impact with any statistical robustness. Further to this limitation, given the complexity of ecological and environmental variability in marine ecosystems, separating the effects of human activities on coastal inshore dolphins from natural ecological and environmental variability, or project impacts from non-project impacts, will be difficult.</p> <p>This limitation in the ability to detect impact has been highlighted by the contractor undertaking the dolphin monitoring and confirmed by the CU Project ITAC megafauna specialist. The ITAC also noted that given the limited knowledge and understanding of the species in Cleveland Bay, the monitoring program will provide a significant science benefit in terms of building on the scientific knowledge of the species in Cleveland and Halifax Bay.</p> <p>Residual impact to listed dolphin species will be determined through the Inshore Dolphin Monitoring Plan (IDMP) in close consultation with the ITAC and DAWE.</p> <p>The Inshore Dolphin Monitoring Plan was developed with an awareness of the above limitations and includes the following to address these limitations:</p> <ul style="list-style-type: none"> <li>• A design that addresses mobility of populations by the inclusion of the primary site (Cleveland Bay) and adjacent bays to the north and south (where able to be accessed). This will assist in distinguishing movements between sites and temporary emigration between primary samples, from demographic changes in Cleveland Bay that otherwise might be attributed to other factors (i.e., decrease in survival);</li> <li>• Alignment of the surveys to be conducted at the same time every year. This will remove the confounding effect of ecological and environmental/seasonal variability;</li> <li>• A design that has been developed with the intention of assessing abundance estimates with a high level of precision (CV ~0.1); and</li> <li>• Selection of highly experienced contractors, with a highly qualified, multidisciplinary team that includes two of the three leading experts in Australia.</li> </ul>
<b>Offset Method</b>	<p>Marine offsets are not as mature as terrestrial offsets with little available literature on primary offsets applied for addressing residual impacts on dolphin species, or any standardised calculation approach for determining a suitable offset.</p> <p>As such the methodologies for calculating and implementing marine offsets is less certain. Particularly for actions that are a direct benefit to the species/habitat of</p>

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	<p>inshore dolphins. Direct offsets are more preferable to indirect offsets however where there are known gaps in dolphin habitat protection, an indirect offset may be viable if it has direct linkage from pathway to impact.</p> <p>If an impact is detected through implementing the IDMP, the Port will undertake the following:</p> <ul style="list-style-type: none"> <li>- Notify ITAC and regulators</li> <li>- Undertake consultation to identify suitable options for offsetting (consultation will be with relevant experts, ITAC and Regulators). Including defining clear objectives to ensure the process is suitably targeted, noting a direct linkage to impact;</li> <li>- With 3 months of notification, formally provide options to the Department for approval for offset projects that align with the above objectives;</li> <li>- Following option approval prepare a project plan for dolphin offset delivery and submit for approval (note this may be a standalone plan or incorporated within the OMS)</li> <li>- The Port to implement the approved project plan</li> </ul>
<b>Reef 2050 long term sustainability plan</b>	<p>Offsets (if required) will contribute to one or more of the following Reef 2050 actions: BA12, BA15 and EBA6 (c), with priority to further;</p> <ul style="list-style-type: none"> <li>- improving the management of key habitat for inshore dolphins;</li> <li>- reducing cumulative impacts on coastal dolphin populations and their supporting habitats especially Australian humpback and snubfin dolphins;</li> <li>- research, and implementing improved measures, to reduce cumulative impacts to listed dolphins from shipping.</li> </ul>
<b>Determination of Offset need</b>	Offset will be required if an impact is determined as a result of implementing the approved Inshore Dolphin Monitoring Plan.
<b>Offset outcome</b>	To be determined on the basis of impacts detected implementing the approved Inshore Dolphin Monitoring Plan.
<b>Delivery</b>	To be developed as part of a dolphin offset project plan, if needed.
<b>Verification of offset</b>	To be developed as part of a dolphin offset project plan, if needed.
<b>Reporting</b>	<p>Will be captured in annual reviews of the performance of the OMS and submitted to the Department and published on the website (in line with condition 27 (f))</p> <p>Reported to the Department if the Inshore Dolphin Monitoring Plan identifies an residual significant impact.</p>

**5.3.3 Limitation – Ability to detect impact**

This limitation in the ability to detect impact has been highlighted by the contractor undertaking the dolphin monitoring and confirmed by the CU Project ITAC megafauna specialist. The ITAC also noted that given the limited knowledge and understanding of the species in Cleveland Bay, the monitoring program will provide a significant science benefit in terms of building on the scientific knowledge of the species in Cleveland and Halifax Bay.

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## 6 BERTH 12 DEVELOPMENT OFFSETS

As noted earlier, this version of the OMS is focused on the Channel Upgrade rock wall, dredging and reclamation activity only and will be revised to provide details of relevant environmental risks and offset requirements with the different phases of construction associated with PEP Stage 1, when required.

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# APPENDIX A

## EPBC Approval Conditions Reference Table

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## OMS relevant EPBC Approval Conditions

Ref	Condition No.	Condition Requirement	OMS Reference	Demonstration of how the plan addresses the condition requirement
1	25	The person taking the action must provide an opportunity for Indigenous people to comment on the management plans and strategies specified in this approval during their preparation. The person taking the action must provide to the Minister a copy of the outcomes of consultation with Indigenous people, and an explanation of how any comments have been addressed in the management plans and strategies.	3.2	Section 4.2 detail the consultation with indigenous stakeholders undertaken in the development of the OMS.
2	27	To compensate for residual significant impacts of the action and to achieve a net benefit to the outstanding universal value of the Great Barrier Reef World Heritage Area, the person taking the action must submit an Offset Management Strategy (OMS) for the Minister's approval before commencement of the action. The person taking the action must not commence the action unless the Minister has approved the OMS. The OMS must include the following:	3.4  Document control sheet	Section 3.4 and the document approval page details the submitting and approval of the OMS to the Department.  The action will not commence until the OMS is approved.
3	27a	details of how the person taking the action will achieve a reduction of sediment entering the marine environment from the Burdekin, Ross and Black river basins, based on the amount of fine sediment determined in Dredging Completion Reports required under Condition 26(b)(i);"	5.1.2	Section 5.1.2 provides details of the fine sediment offset to be implemented as part of the CU Project (to be revised with detail in the next draft).
4	27b	details on how the person taking the action will achieve a reduction of sediment entering the marine environment from the Burdekin, Ross and Black river basins, if monitoring undertaken in accordance with condition 5(j) identifies actual lethal or sub-lethal impacts on sensitive habitat sites, including seagrasses or corals. The sediment offset must be based on the amount of fine sediment that was available for resuspension before commencement of the relevant stage	5.1.2	Section 5.1.2 provides details of the fine sediment offset to be implemented as part of the CU Project (to be revised with detail in the next draft).

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		of the action, as determined in Dredging Completion Reports required under Condition 26(b)(ii);		
5	27c	if residual impacts to listed dolphin species in Cleveland Bay from the proposed action are identified through monitoring undertaken in accordance with Condition 24, details of how the person taking the action will compensate for the residual impacts to listed dolphin species;	4.2.2 5.3.2	<p>Section 4.2.2 provides details of the intended offsets to be applied should there be a residual significant impact on listed dolphin species from rock wall construction activities.</p> <p>Section 5.3.2 provides details of the intended offsets to be applied should there be a residual significant impact on listed dolphin species from dredging activities.</p>
6	27d	if seagrasses are identified in the dredge footprint or reclamation area from surveys undertaken in accordance with Conditions 3 and 9, details of how the person taking the action will compensate for the loss of seagrasses within the dredge and reclamation footprints, taking account of the density of seagrass coverage;	4.1.2 5.2.2	<p>Section 4.1.2 provides details of no seagrass being found in the footprint of the reclamation area and therefore no offset for seagrass loss is required.</p> <p>Section 5.2.2 provides details of the intended offsets to be applied should there be a seagrass found in the footprint of the dredging activities.</p>
7	27e	details of how the proposed offset actions or contributions to programs align with the broader strategies and programs for the Great Barrier Reef, including but not limited to the Reef 2050 Long-term Sustainability Plan; and	4 5	<p>Section 4 and 5 detail the offset assessment and program associated with Rock wall construction activities and dredging respectively.</p> <p>The proposed offsets detail where they align with specific strategies and programs for the GBR, including the Reef 2050 Long term Sustainability Plan.</p>
8	27f	a process for annual reviews of the performance of the OMS for the life of the approval including timeframes for conducting the reviews and for publishing the findings of each review on the website of the person taking the action.	3.6 3.7	Section 3.6 and 3.7 provides details of the annual review of the OMS and other potential reasons for review. This includes publishing of the compliance and other review outcomes on the the Port's Website.
9	28	The person taking the action may provide a contribution to the Reef Trust or equivalent to meet the requirements of Condition 27 in whole or part. The OMS must detail how the proposed contributions to Reef Trust will meet the requirements of Condition 27 before submission of the OMS to the Minister for approval.	N/A	At this point, a contribution to Reef Trust is not included as part of the OMS.

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10	29	The OMS may be submitted to the Minister in stages, but the OMS must be submitted before the commencement of each stage, and the respective stages must not commence until the Minister has approved the respective version of the OMS.	2.2 2.3 2.4	Section 2.2 and 2.3 detail the staging of the PEP and the delivery of the OMS to the Department in line with the specific stage, or phase of construction.  Section 2.4 details the review of the OMS for each stage and that no works for each stage will commence until the OMS for that stage is approved.
11	30	The approved OMS must be implemented.	3.5	Section 3.5 establishes that the OMS will be implemented as per the documented actions.
12	31	Unless otherwise agreed in writing by the Minister, each plan or strategy specified in the conditions must be independently peer reviewed before submission to the Minister for approval.	3.3	Section 3.3 details the peer review undertaken for the OMS.
13	32	The reviews undertaken for Condition 31 must include an analysis of the effectiveness of the avoidance and mitigation measures in meeting the outcomes, targets or management measures identified in the plan/s or strategies being reviewed.	3.3	Section 3.3 details the peer review undertaken for the OMS.
14	33	Unless otherwise specified in these conditions or notified in writing by the Minister, the person taking the action must provide to the Minister a copy of all advice and recommendations made by the independent peer reviewer(s) with the plan or strategy, and an explanation of how the advice and recommendations will be implemented, or an explanation of why the person taking the action does not propose to implement certain recommendations.	3.3	Section 3.3 details the peer review undertaken for the OMS.  The peer review comments and the Port advice and response against each comment was supplied to the Department on 14 January 2020.
15	35	The person taking the action must maintain accurate records substantiating all activities associated with, or relevant to, the conditions of approval, including measures taken to implement the management plans and strategy required by this approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval.	3.8	Section 3.8 outlines the records management system in operation for the CU Project in line with the Port Quality Management System.

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16	36	Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published.	3.6	Section 3.6 details the annual reporting for the project, covering a compliance review against the Approval conditions, outcomes of environmental monitoring and OMS periodic review results.
18	44	Unless otherwise agreed to in writing by the Minister, the person taking the action must publish all management plans, reports and strategies referred to in these conditions of approval on their website. Each management plan, report and strategy must be published on the website within 1 month of being approved by the Minister or being submitted under Condition 38a).	Document control sheet	The document approval page details the date of posting of the OPMS onto the Port website.

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**Registered Office**

Administration Building  
Benwell Road  
South Townsville QLD 4810

**p** + 61 7 4781 1500

**f** + 61 7 4781 1525

**e** [ccuproject@townsvilleport.com.au](mailto:ccuproject@townsvilleport.com.au)

**w** [www.channelcapacityupgrade.com.au](http://www.channelcapacityupgrade.com.au)