Mission Beach Clump Point Boating Infrastructure Project: Construction Environmental Management Plan

Document Control Sheet

PREPARATION AND AUTHORISATION

DATE	NAME	POSITION	SIGNATURE
16 Dec 18	Andrew Schweitzer	Project Manager	

REVISION STATUS

REVISION	DATE	DETAILS	PREPARED BY	APPROVED BY
A	20 Dec 18	Original – Modified from BMT CEMP	Andrew Schweitzer	Guy Schweitzer
B	7 Jan 19	Review by TMR	Andrew Schweitzer	Guy Schweitzer
C	16 Jan 19	Review by TMR	Andrew Schweitzer	Guy Schweitzer
D	21 Feb 19	Review by TMR	Andrew Schweitzer	Guy Schweitzer

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Project CEMP issued to the following members of the Project Team:

NAME	SIGNATURE	DATE
Neville Foley		

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1. Introduction

1.1 Purpose

This construction environmental management plan (CEMP) has been prepared in order to manage the environmental impacts associated with the construction phase of the Mission Beach Clump Point Boating Infrastructure Project. These works involve both landside and water-based activities within sensitive environments at Clump Point, Mission Beach. The Principal for these works is the Department of Transport and Main Roads (TMR) and the head Contractor is MGN Civil Pty Ltd.

The CEMP documents the environmental outcomes intended to be achieved during the construction phase, including recommended actions to achieve these outcomes and monitor performance. The CEMP also identifies further management documentation and investigations required prior to commencement of construction works. This has been developed to reflect both the existing environment of the Project area and the statutory approvals for the works.

1.2 Locality Description

Clump Point is a coastal promontory comprised of Cainozoic basalts, forming a shallow, north-facing coastal embayment known as Boat Bay. The existing infrastructure and facilities at Clump Point consist of the following:

- Two-lane boat ramp;
- Rock breakwater;
- Floating walkway; and
- Car and boat trailer parking facilities.

The boat ramp and facilities are accessible by Clump Point Road, which joins to Alexander Drive/Porter Promenade.

The boat ramp is located on Lot 550/NR7351, a state reserve set aside for ‘boat harbour’ purposes and managed by the Cassowary Coast Regional Council (CCRC). Project works will primarily occur within this reserve but also occur on Lot 540/NR7350, a state reserve for ‘scenic and recreation’ purposes administered by CCRC, and the road reserves of Clump Point Road, Alexander Drive and Port Promenade.

1.3 Project Approvals

The construction for the Project will be undertaken subject to the following approvals:

- 1711-2484 SDA – Development Permit (DP) for all aspects of construction;
- G18/39785.1 – Permit for works within the Great Barrier Reef Marine Park (GBRMP) and Great Barrier Reef Coast Marine Park (GBR Coast MP)
- CA0000008 – Allocation of Quarry Material for removal of sediment from below high water;
- Approvals for maintenance works at existing boat ramp (i.e. removal of siltation material):
    - *Harbours Act 1955* s86 Sanction 300325 (72);
    - Environmental Authority (EA) EPPR03740716;
    - AQM ENAQ06648916; and
    - GBRMP/GBR Coast MP Permit – G18/38869.1

TMR also hold an EA for removal of soft sediment within the construction footprint. However, updates to detailed design indicate this material can be retained. Therefore, these permits will not be triggered.

2. CEMP Overview

2.1 CEMP Components

The CEMP includes the following components:

- Roles and responsibilities regarding environmental management activities;
- Project design and proposed construction methodology;
- Environmental and statutory context, including likely construction phase environmental impacts;
- Environmental management elements for key environmental values, i.e. water quality and soils, terrestrial ecology, marine ecology, cultural heritage, traffic, and air, noise and lighting, as well as for management of waste and hazardous substances; and
- Actions to take in the event of emergency/contingencies.

This CEMP is a living document and in the event construction activities are identified during works that are not covered in this CEMP, it is the responsibility of the MGN Civil to identify the environmental impacts associated with these activities and develop appropriate environmental management measures to discharge their statutory and contractual obligations and reflect these in an updated CEMP

2.2 Roles and Responsibilities

The following persons have roles and responsibilities as part of this CEMP:

- MGN Civil (for construction phase), including:
  - Project Manager and Construction Manager – are the managers of the construction works; responsible for on-ground implementation of the CEMP and compliance with all statutory/approval obligations, including regular reporting to TMR.
  - MGN Civil staff and MGN Civils sub-contractors – personnel involved in actual construction works; responsible for implementation of aspects of the CEMP and compliance with environmental duty of care.
- TMR, as represented by the following:
  - Principal – management of Project, responsible for ensuring works comply with statutory/approval obligations, auditing of the works site, and will report to approving agencies and other relevant bodies (e.g. nominated stakeholders).
  - Project Engineer – overseer of engineering and technical-based work for Project construction; responsible for ongoing review of works against engineering requirements and technical specifications.

- GBRMPA, as represented by:
  - Environmental Site Supervisor– independent supervisor for Project with authority to direct MGN Civil and Principal to stop, suspend or modify works to avoid environmental harm.
  - Compliance Assessor – responsible for ensuring overall compliance of the project with Permit G18/39785.1 and a Deed of Agreement between TMR and GBRMPA, including auditing and receipt of reports and notifications.
- State Assessing Agencies, including Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP), Department of Environment and Science (DES) and Department of Agriculture and Fisheries (DAF) – agencies responsible for managing compliance with DP 1711-2484 SDA, including auditing and receipt of reports and notifications.

2.3 Links to Other Management Instruments

In addition to the CEMP, the following policies, management plans and other instruments will be relevant to environmental management during the construction phase:

- TMR's Environmental Policy;
- TMR's environmental management technical publications;
- MGN Civils Environmental Policy and Environmental Management System;
- Environmental approvals for the Project;
- Deed of Agreement between GBRMPA and TMR;
- Agency operational/environmental policies relevant to the Project (see Section 4.2); and
- Project contract package for MGN Civil.

3. Project Description and Construction Methodology

3.1 Project Description

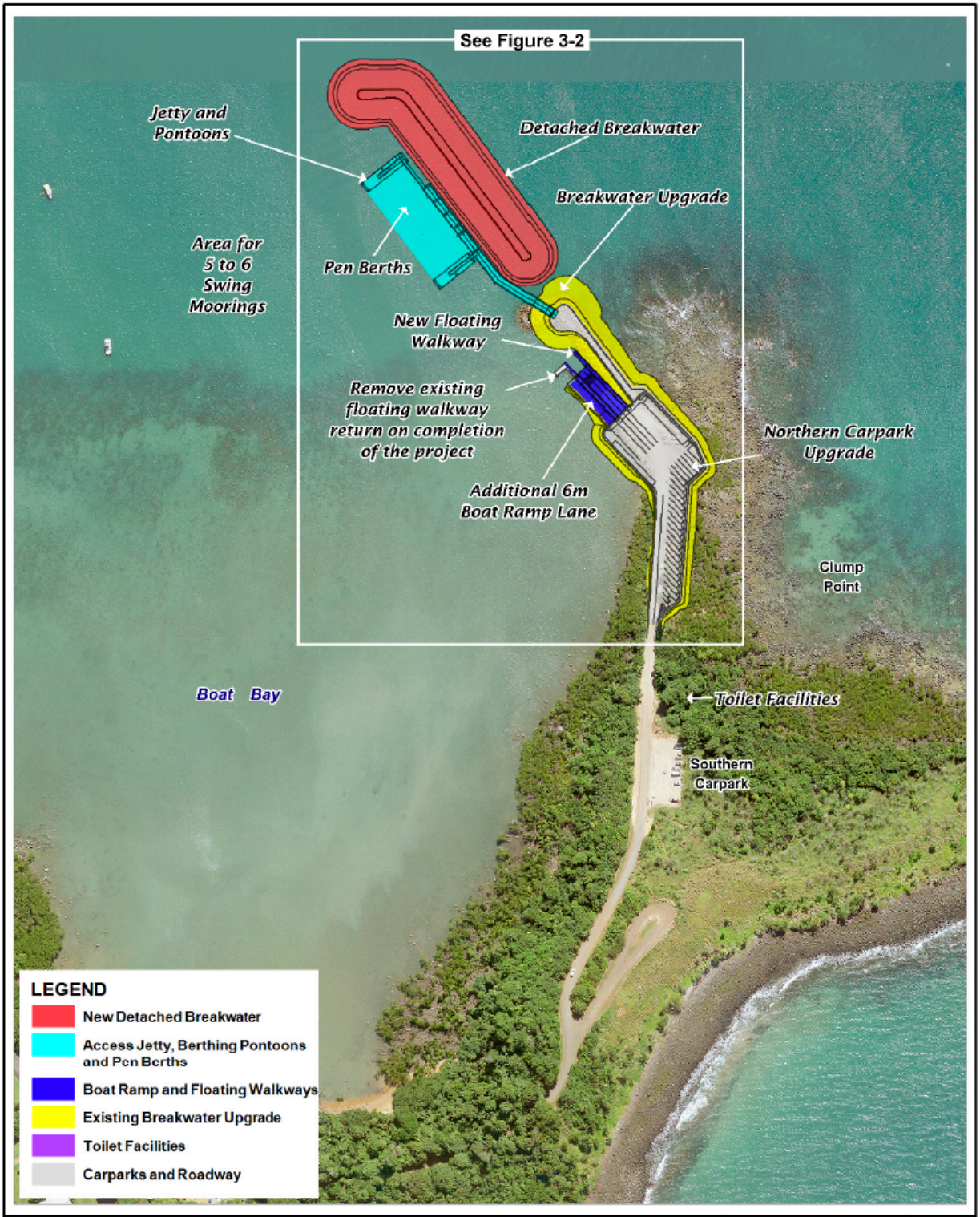
The Project consists of the following works:

- Construction of a new detached breakwater;
- Upgrade of existing breakwater, including removal of existing breakwater return and reclamation of intertidal and subtidal land;
- Upgrade of lower carpark;
- Upgrade of boat launching facility, including extension of the existing ramp, new heavy-duty boat ramp, and treatment of inner breakwater to bind armour;
- Construction of a composting toilet; and
- Installation of solar-powered navigational lighting and public access lighting.

These works are shown in Figure 3-1 to Figure 3-3.

As part of construction, it is necessary to reclaim some land below mean high water springs (MHWS), clear vegetation in proposed terrestrial infrastructure footprints, and alter and remove benthic habitats within the proposed marine infrastructure footprints. Some minor excavation for the buried toes at the detached breakwater/revetment interface is required. Impacts associated with these activities are described in Section 4.3.

In addition to these works, some silt clearing in front of the boat ramp will occur as part of the existing maintenance approvals. A separate Environmental Management Plan (Maintenance) for these works is attached in Appendix A, including environmental obligations and management measures for these works.



Title:

Project Study Area and Concept Design

Figure: **3-1**

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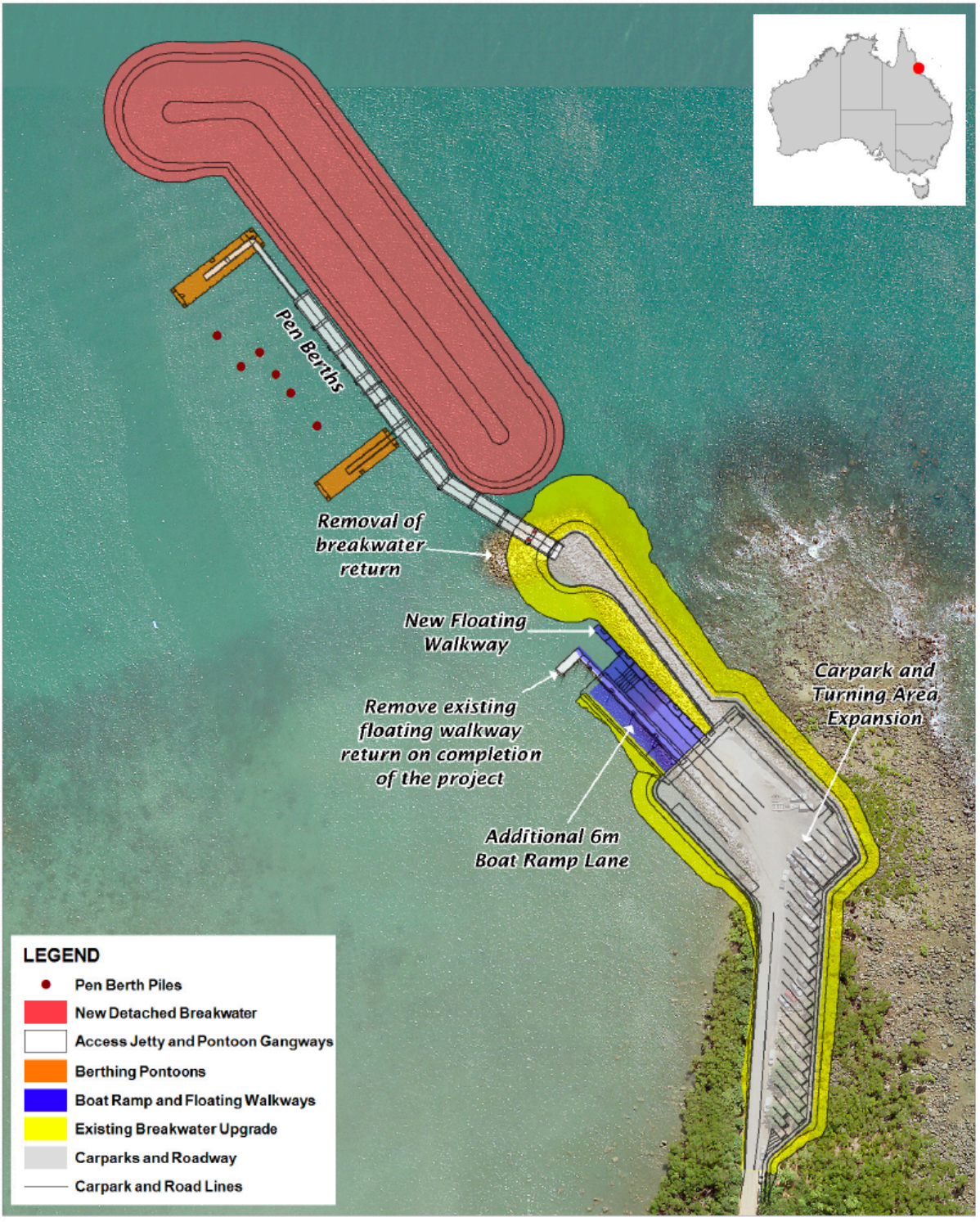

Title:
Project Marine Infrastructure Elements

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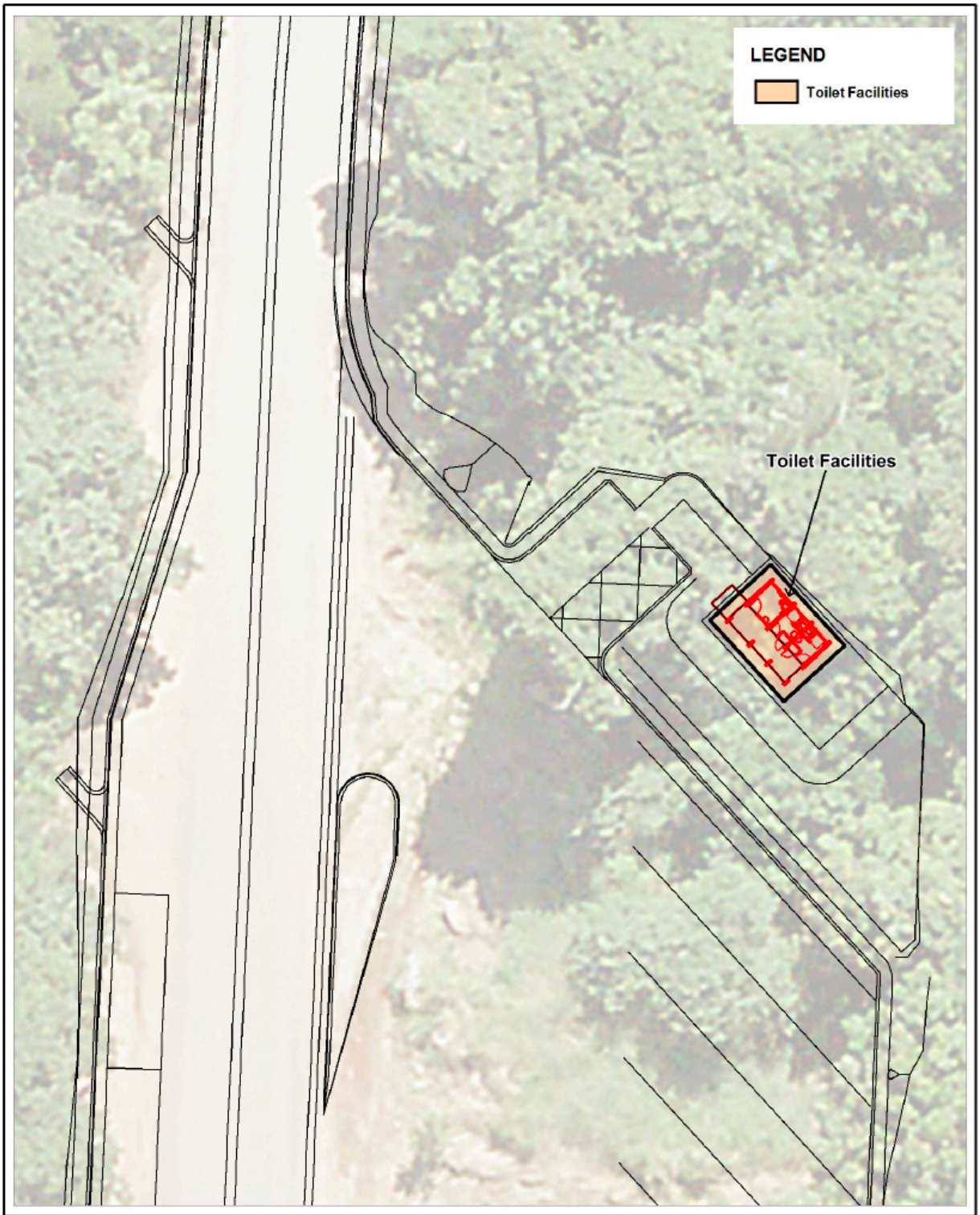

Title:
Project Toilet Block

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3-3

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3.2 Construction Methodology and Scheduling

The Project Construction Methodology has been designed by MGN Civil and is located in Appendix B. Figure 3-4 defines the works extent and Figure 3-5 outlines the specific impact and exclusion zones that will apply during the works as defined from the detailed design and approvals.

The works methodology will consist of the following activities:

- Construction of a temporary causeway with sufficient box culverts to maintain minimum flow at mean low water springs (MLWS) based on 25m crest gap modelled flows. The causeway will be removed at the end of works.
- Progressive construction of the new breakwater from the end of the existing breakwater, while retaining a gap at all times.
- Expansion of the existing boat ramp, including upgrade of adjoining breakwater (western side) and reclamation of land for roadway and clearing of vegetated areas within this footprint.
- Upgrade of the remainder of the existing breakwater and removal of the existing breakwater return to achieve a minimum depth of RL -2.41 m AHD.
- Rehabilitation of cleared areas where necessary.
- Rock material for construction will be sourced from Bonassi quarry. This material will be transported to the Project area by side tipping trucks utilising local access roads.
- During the construction phase, a stockpile and laydown area will be maintained in the existing car park near the boat ramp.
- During construction, works will also be undertaken to remove maritime debris from the works area, including the floating walkway modules within the nearby mangroves (being undertaken by CCRC) and anchor chains in coral reefs of Boat Bay (where appropriate).

Title:
Construction Works Area

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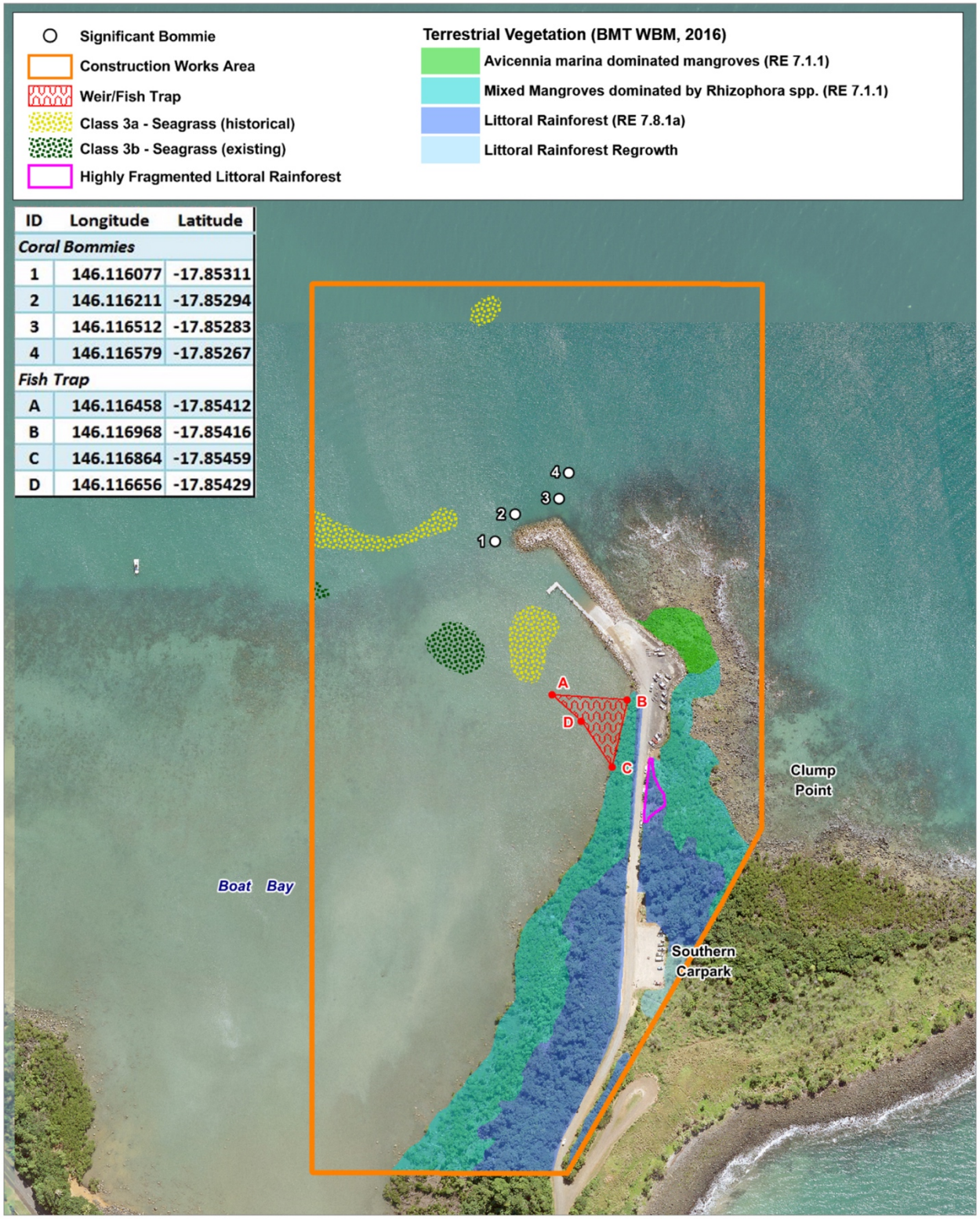

Title:

Specific Impact Areas and Exclusion Zones

Figure: 3-5

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Condition 2 of DP 1711-2484 SDA prevents clearing of marine plants between November and February due to potential impacts to fisheries resources. Therefore, the primary construction phase for the Project will be planned during winter months. This will also avoid the risks associated with summer storms and tropical cyclones. The total construction phase is expected to take approximately 10 months.

4. Environmental and Statutory Context

4.1 Existing Environment

Clump Point is one of the only basalt points within the Wet Tropics area. the eastern and northern margins of Clump Point comprise mainly basalt rock and weathered boulders, and the terrestrial soils of the Project area are of basaltic origins. Soils in the vicinity of the boat ramp are silty clay with a high plasticitiy and very soft to soft consistency.

Mapping by the CSIRO National Acid Sulfate Soils (ASS) Atlas identifies part of the Project area as having a 'high' probability of occurrence of ASS. This occurs along the north-west facing edge of Clump Point, with the remainder considered to have an 'extremely low' probability of occurrence. This is shown in Figure 4-1. This mapping indicates there is an ASS risk that will need to be managed for the Project, although it is noted that no significant disturbance of ASS material is expected to occur.

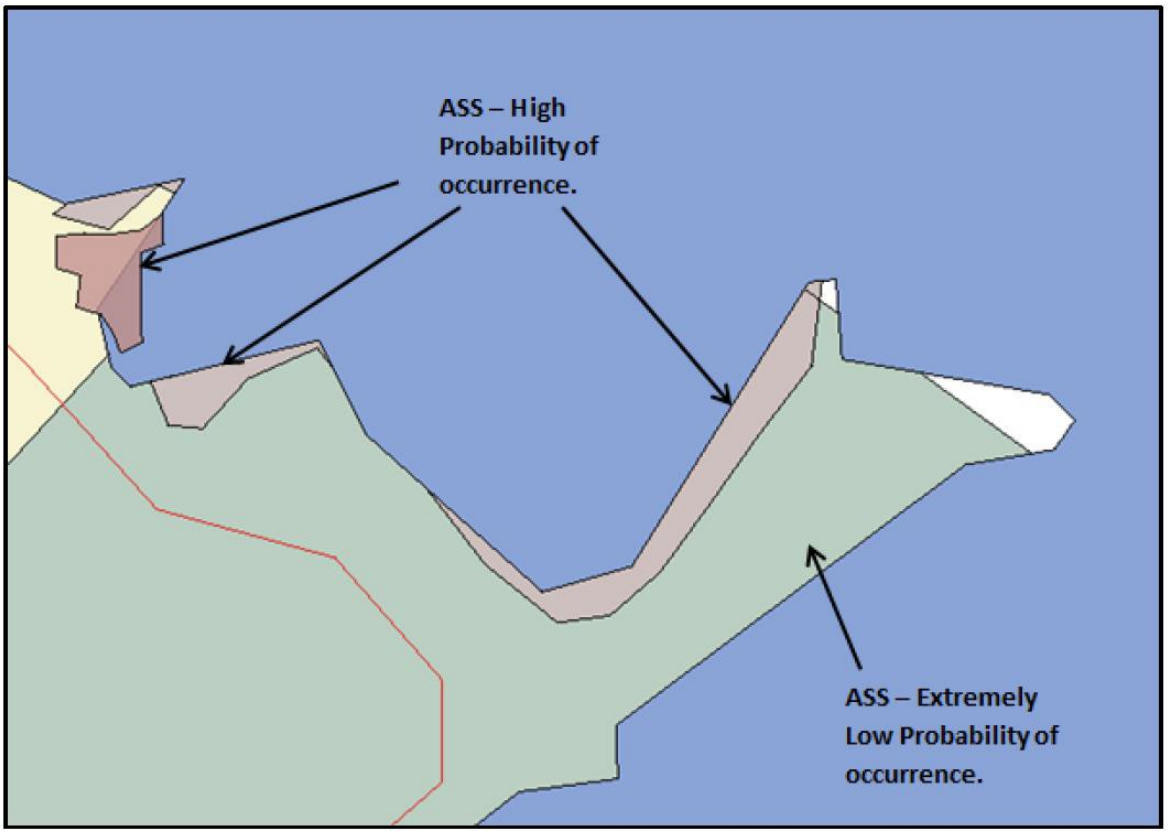


Figure 4-1 ASS Probability of Occurrence, based on CSIRO National ASS Atlas

There are no rivers or creeks within the Project area and, as a result, runoff from Clump Point is expected to occur as sheet flows directly into the ocean.

Ecological values in the Project area can be split into terrestrial values (including mangroves) and marine values.

4.2 Terrestrial Ecology (including Mangroves)

The northern part of Clump Point supports two main vegetation communities:

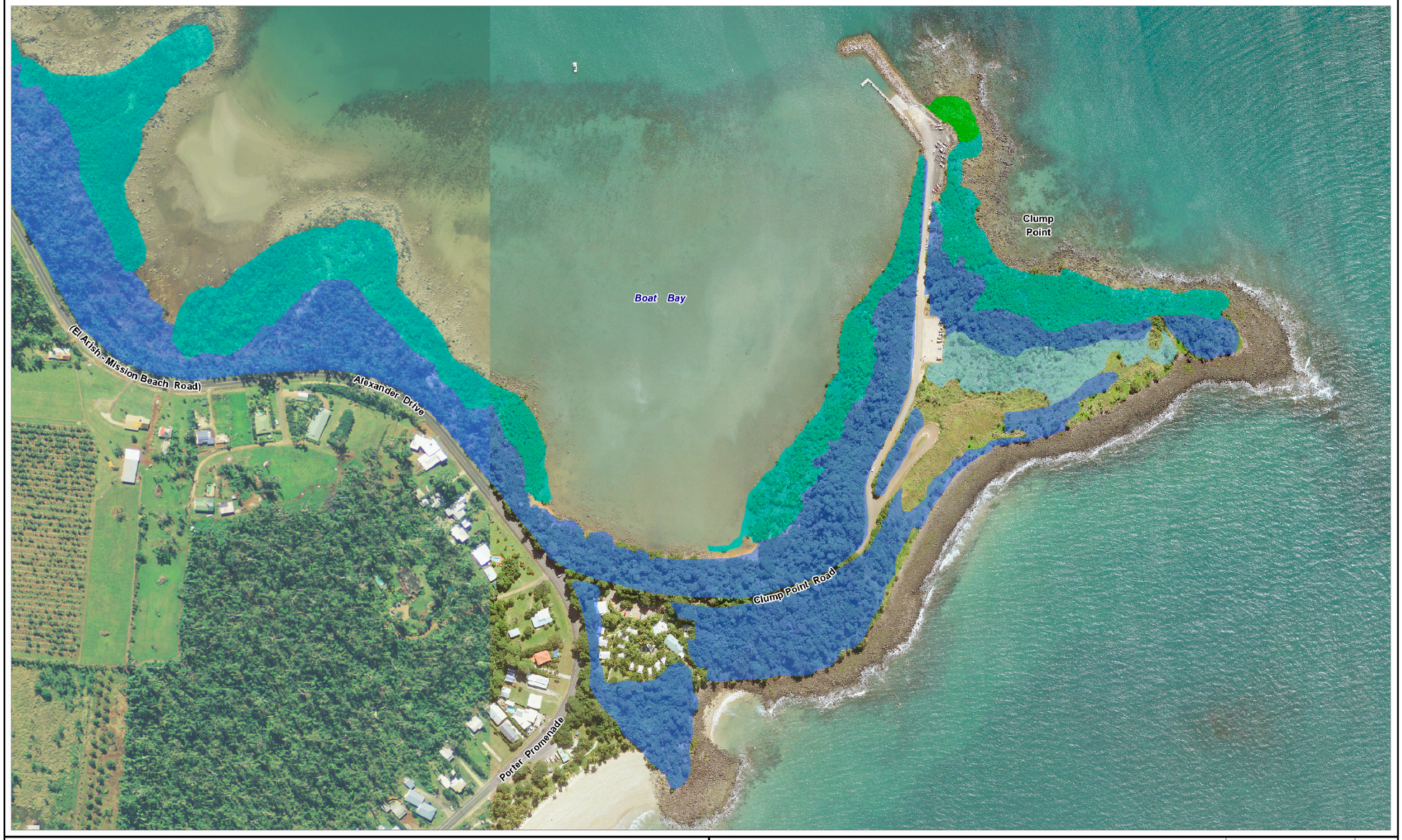
- Mangrove forest, including:
  - *Avicennia marina* dominated mangroves;
  - Mixed mangroves dominated by *Rhizophora* spp; and
- Littoral rainforest.

These two communities correspond to regional ecosystems (RE) 7.1.1 (mangroves) and RE 7.8.1a (complex mesophyll vine forest). These communities have been identified based on interpretation of aerial mapping and ground-truthing (BMT WBM, 2016b). Notably, within this area, only one community, RE 7.1.1 has been mapped on the Regulated Vegetation Management Map. These communities are shown in Figure 4-2, together with other vegetation in the Project area.

RE 7.1.1 is a Least Concern community under the Vegetation Management Act 1999 (Qld) (VM Act) consisting of a number of species considered to be 'marine plants' for the purposes of the Fisheries Act 1994 (Qld), i.e. plants occurring on or adjacent to tidal land, including mangroves. No threatened flora species listed under the Nature Conservation Act 1992 (Qld) (NC Act) or Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) have been identified within this area of the community based on 2016 surveys (BMT WBM, 2016b).

RE 7.8.1a is an Endangered community under the VM Act and corresponds to the littoral rainforest and coastal vine thicket of eastern Australia threatened ecological community (TEC), listed as Endangered under the EPBC Act. No flora species listed as threatened under the NC Act or EPBC Act have been identified within this area of the community based on 2016 surveys, although the Arenga palm (Arenga australasica) grove and individual trees are known to occur in this community within the Project area (see Figure 4-2) (BMT WBM, 2016b).

Threatened flora species that could occur in the Project area, including areas that may be cleared, consist of those listed in Table 4-1. This includes species listed as threatened under the NC Act, EPBC Act and International Union for the Conservation of Nature (IUCN) Red List of Threatened Species.1



LEGEND

Terrestrial Vegetation (BMT WBM, 2016)

- Avicennia marina dominated mangroves (RE 7.1.1)
- Mixed Mangroves dominated by Rhizophora spp. (RE 7.1.1)
- Littoral Rainforest (RE 7.8.1a)
- Littoral Rainforest Regrowth

Title:
Terrestrial Vegetation Communities of the Project Area

Figure: 4-2

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Table 4-1 Threatened terrestrial flora species that could potentially occur in Project area

Common name	Scientific name	Status		
		NC Act	EPBC Act	IUCN Red List
Arenga palm	*Arenga australasica*	Vulnerable	Not Listed	Not Evaluated
(a climber)	*Carronia pedicellata*	Endangered	Endangered	Not Evaluated
(a fern)	*Chingia australis*	Endangered	Endangered	Not Evaluated
Cooktown orchid*	*Dendrobium bigibbum* OR *Vappodes phalaenopsis*	Vulnerable	Vulnerable	Not Evaluated
(an orchid)	*Phaius pictus*	Vulnerable	Vulnerable	Not Evaluated

**D. biggibum* and *V. phalaenopsis* are generally regarded as synonymous

Habitat values supported by vegetation communities in the Project area can be described as follows:

- Diverse, contiguous and extensive rainforest habitat in close proximity to mangrove communities, in good condition, with high native species diversity and habitat complexity and a high likelihood to support a number of species of conservation value.
- Very high diversity of microhabitat features across the Project area, such as high abundance of large logs, rocks, stones, coral rubble and leaf litter, which would promote very high fauna diversity and abundance.
- High abundance of hollow-bearing trees, fruit and plant resources to support a high number and diversity of arboreal mammals and hollow-nesting birds.
- High levels disturbance to local fauna expected from large volumes of vehicles along Clump Point Road.

Much of the habitat at Clump Point is mapped as Essential Habitat for the southern cassowary (*Casuarius casuarius johnsonii*) and the area is known to support multiple adults, although there is no Essential Habitat within the works area. The southern cassowary is Vulnerable under the NC Act and Endangered under the EPBC Act, as well as having local cultural heritage values. Estimates by Westcott et al. (2014) indicate a population of up to 187 birds within the Mission Beach area at a density of 1.09 birds/km2. Cassowaries are known to commonly cross Clump Point Road but are unlikely to occur at northern part of the point due to lack of suitable habitat.

The threatened terrestrial fauna species that could occur in the Project area listed in Table 4-2, together with their listing under the NC Act, EPBC Act and IUCN Red List. In addition to these threatened species, there are a variety of migratory shorebird species (i.e. *Charadriiformes*) which could occur within the Project area, in addition to other intertidal areas within Mission Beach. The Project area is not considered to be important habitat for these species.

Table 4-2 Threatened terrestrial fauna species that could potentially occur in Project area

Common name	Scientific name	Status		
		NC Act	EPBC Act	IUCN Red List
Southern cassowary	*Casuarius casuarius johnsonii*	Vulnerable	Endangered	Vulnerable
Red goshawk	*Erythrotriorchis radiatus*	Endangered	Vulnerable	Near Threatened
Bar-tailed godwit (baueri)	*Limosa lapponica baueri*	Vulnerable	Vulnerable	Not Evaluated / Near Threatened[1]
Northern Siberian bar-tailed godwit	*Limosa lapponica menzbieri*	Endangered	Critically Endangered	Not Evaluated / Near Threatened[1]
Masked owl	*Tyto novaehollandiae kimberli*	Vulnerable	Vulnerable	Not Evaluated / Least Concern[2]
Macleay's fig-parrot	*Cyclopsitta diophthalma macleayana*	Vulnerable	Not Listed	Not Evaluated / Least Concern[3]
Beach stone-curlew	*Esacus magnirostris*	Vulnerable	Not Listed	Near Threatened
Australian lacelid	*Litoria dayi*	Endangered	Endangered	Endangered
Northern quoll	*Dasyurus hallucatus*	Not Listed	Endangered	Endangered
Spotted-tailed quoll (North Queensland)	*Dasyurus maculatus gracilis*	Endangered	Endangered	Not Evaluated / Near Threatened[4]
Semon's leaf-nosed bat	*Hipposideros semoni*	Endangered	Vulnerable	Data Deficient
Ghost bat	*Macroderma gigas*	Endangered	Vulnerable	Vulnerable
Spectacled flying-fox	*Pteropus conspicillatus*	Vulnerable	Vulnerable	Least Concern
Bare-rumped sheathtail bat	*Saccolaimus saccolaimus nudicluniatus*	Endangered	Vulnerable	Not Evaluated / Least Concern[5]

[1] *L. lapponica baueri* and *L. lapponica menzbieri* are Not Evaluated on the IUCN Red List as individual subspecies but *L. lapponica* has been assessed as Near Threatened.

[2] *T. novaehollandiae kimberli* is Not Evaluated on the IUCN Red List as an individual subspecies but *T. novaehollandiae* has been assessed as Least Concern

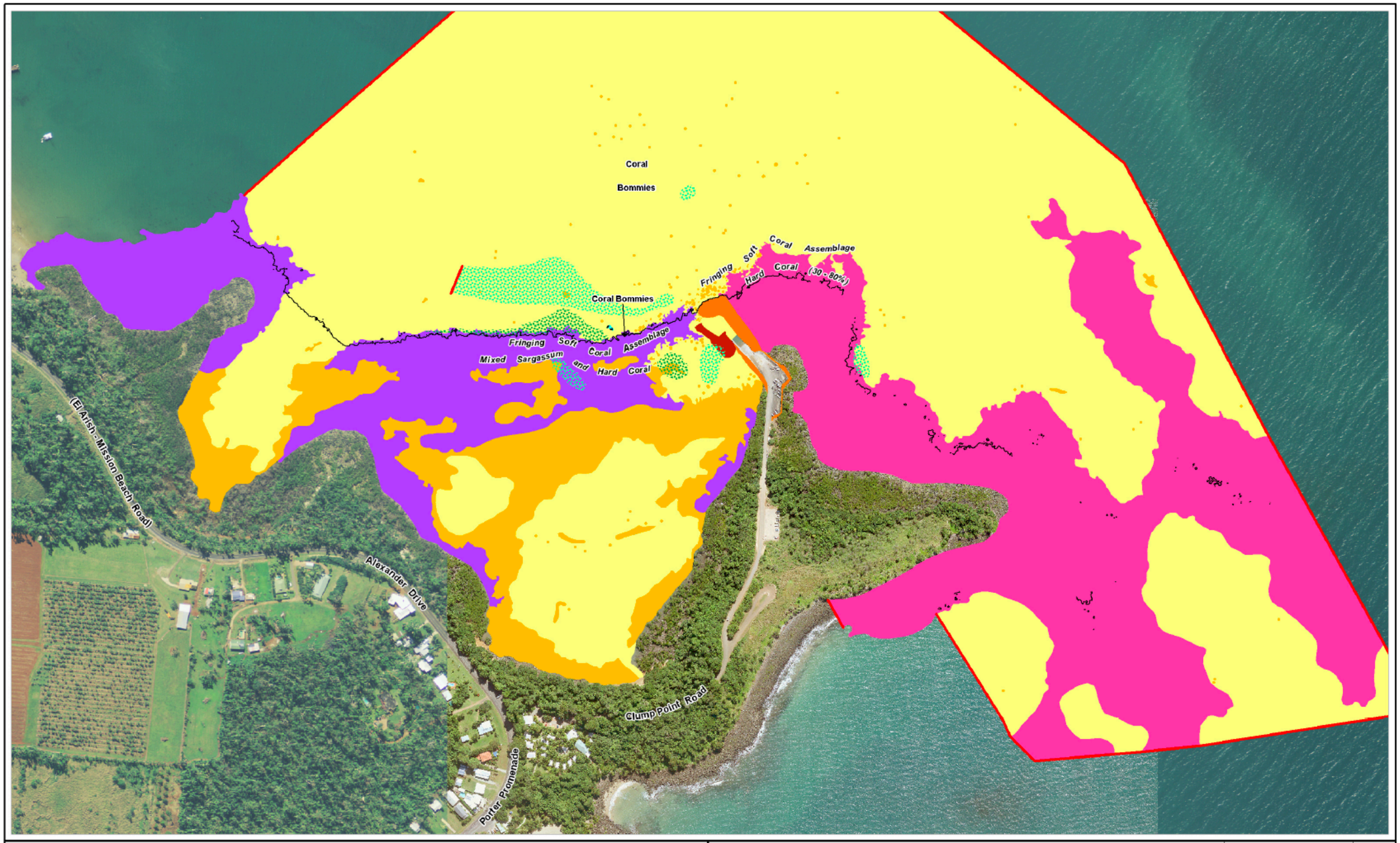
[3] *C. diophthalma macleayana* is Not Evaluated on the IUCN Red List as an individual subspecies but *C. diophthalma* has been assessed as Least Concern

[4] *D. maculatus gracilis* is Not Evaluated on the IUCN Red List as an individual subspecies but *D. maculatus* has been assessed as Near Threatened

[5] *S. saccolaimus nudicluniatus* is Not Evaluated on the IUCN Red List as an individual subspecies but *S. saccolaimus* has been assessed as Least Concern

4.3 Marine Ecology

Within the marine environment, the main values of the Project area are benthic primary producer habitat, i.e. seagrass, benthic algae, corals and mangroves. The occurrence of soft and hard sediments, reefs and seagrass are shown in Figure 4-3. Mangroves are discussed in Section 4.2 above. No saltmarsh communities occur within the Project area.


Coral
Bommies
Coral Bommies
Fringing Soft Coral Assemblage
Hard Coral (30 - 80%)
Fringing Soft Coral Assemblage
Mixed Sargassum and Hard Coral
(El Arish - Mission Beach Road)
Alexander Drive
Clump Point Road
Porter Promenade
LEGEND
Limit of Mapping
Contour: -1m LAT Depth
Rock Walls
Shipwreck
Class 1a - Clump Point Reef
Class 1b - Boat Bay Boulder Field (>20% cover)
Class 2a - Soft Sediments with Isolated, Low Density (<20% cover) Boulders
Class 2b - Soft Sediments (sandy)
Class 2c - Soft Sediments (mud)
Class 3a - Seagrass (historical)
Class 3b - Seagrass (existing)
Title:
Benthic Habitats of the Project Area
Figure:
4-3
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Ephemeral patches of seagrass occur in Boat Bay, with two known *Halodule uninervis* and Halophila ovalis dominated meadows recently mapped within the Project area at the edge of a basalt boulder field (BMT WBM, 2016a). Other seagrass species occurring in this area include *Cymodocea serrulata*, *Enhalus acoroides* and *Halophila decipiens*. Historically, a small seagrass meadow occurred and identified approximately 200 m offshore of the current breakwater structure, with a larger meadow (~300 m long) within ~50 m of the western end of the breakwater return (Aurecon, 2014). These meadows were not present during surveys in 2016, indicating seagrass in the Project area is ephemeral. Coral communities in the Project area consist of a range of hard and soft corals occurring on the Clump Point reef (east of the breakwater), within the Boat Bay boulder field (west of the breakwater), and on large isolated submerged basaltic boulders (bommies).

The Clump Point reef is a broad fringing reef community, dominated by hard corals. Coral cover in this area ranges between 30 and 80% (BMT WBM, 2016a). This reef backs immediately on to the eastern side of the existing breakwater and extends all the way around to the southern side of the point. A fringing soft coral assemblage occurs along the northern boundary of the reef. Key taxa groups include hard corals (particularly *Goniastrea, Turbinaria*, *Acropora)*, soft corals (particularly *Sarcophyton*, *Lobophytum* and *Sinularia*), and macroalgae (*Sargassum flavicans*, *Padina spp*., *Halimeda opuntia*, *Galaxaura spp*. *Codium spp*.).

The Boat Bay boulder field is a large, contiguous fringe of basaltic cobble and boulders. This supports a wide range of reef benthos, including hard corals, soft corals, hydroids, sponges and oysters (BMT WBM, 2016a). A number of bommies occur within the boulder field, as well as in areas adjacent to the existing breakwater. The bommies near the breakwater support a range of macroalgae and hard corals, while further offshore, boulders have a lower profile and support a mixed assemblage of hard and soft corals and encrusting reef fauna (BMT WBM, 2016a).

These marine habitat types support a range of fish, reptile and mammal species, including a number of species that are listed as threatened or migratory under State and Commonwealth legislation. The Clump Point reef and Boat Bay boulder field provide suitable feeding habitat for the green turtle (Chelonia mydas) and other marine turtle species. In addition, seagrass meadows in Boat Bay support feeding by green turtles and dugong (Dugong dugon) together with various fish and cephalopod species.

Intertidal areas may provide habitat for saltwater crocodiles (Crocodylus porosus) which are also expected to occur within the marine environment. Turtle nesting in intertidal areas of the Project area is not expected as there are no sandy beaches.

Table 4-3 presents the marine fauna species listed as threatened under State and Commonwealth legislation that could occur within the Project area. Additional species listed as globally threatened or near threatened under the IUCN Red List, but are not considered as threatened under Australian legislation, are also known or could occur in the Project area. This includes for example several hard-coral species (e.g. several Acropora spp., Turbinaria spp., Goniastrea spp.), bony fish (e.g. Epinephelus spp., Hippocampus spp.) and sharks/rays (Anoxypristis cuspidata, Carcharhinus albimarginatus).

Table 4-3 Commonwealth and state listed threatened marine species that could occur in Project area

Common name	Scientific name	Status		
		NC Act	EPBC Act	IUCN Red List
BALAENOPTERIDAE (whales)				
Humpback whale	*Megaptera novaeangliae*	Vulnerable	Vulnerable	Least Concern
CHELONIIDAE (marine turtles)				
Green turtle	*Chelonia mydas*	Vulnerable	Vulnerable	Endangered
Loggerhead turtle	*Caretta caretta*	Endangered	Endangered	Vulnerable
Hawksbill turtle	*Eretmochelys imbricata*	Endangered	Vulnerable	Critically Endangered
Flatback turtle	*Natator depressus*	Vulnerable	Vulnerable	Data Deficient
Olive ridley turtle	*Lepidochelys olivacea*	Endangered	Endangered	Vulnerable
CROCODYLIDAE (crocodiles)				
Saltwater crocodile	*Crocodylus porosus*	Vulnerable	Not Listed	Least Concern
DELPHINIDAE (dolphins)				
Snubfin dolphin	*Orcaella heinsohni*	Vulnerable	Not Listed	Near Threatened
Indo-Pacific humpback dolphin	*Sousa chinensis*	Vulnerable	Not Listed	Near Threatened
PRISTIDAE (sawfishes)				
Dwarf sawfish	*Pristis clavata*	Not Listed	Vulnerable	Endangered
Green sawfish	*Pristis zijsron*	Not Listed	Vulnerable	Critically Endangered
RHINCODONTIDAE (whale sharks)				
Whale shark	*Rhincodon typus*	Not Listed	Vulnerable	Endangered

4.4 Cultural Heritage Values

Clump Point is a significant cultural heritage location for the Djiru people (the local Aboriginal group). It represents a key basalt formation along the coastline of the Wet Tropics that is unique to the Clump Point region and therefore of environmental and research significance for the Djiru people. Clump Point is also the location of a number of recognised cultural heritage features/sites, listed on the Department of Aboriginal and Torres Strait Islander Partnerships (DATSIP) register:

- FM:B33 – earthern arrangements/ceremony ground, located on Lot 115/NPW502.
- FM:B42 – weir/fish trap, located in the intertidal area south of the ‘elbow’ of the Clump Point boat ramp.

- FM:B43 – isolated find (likely a stone alignment), located in Alexander Drive road reserve, near junction with Clump Point Road – a study published by the Girrigun Aboriginal Corporation (GAC, 2007) indicates this is a ceremony ground.
- FM: B44 – weir/fish trap, located in intertidal area south of Clump Point Road.

All sites and measures to protect them have been discussed by DSDMIP/TMR and the Djiru people. The Project design has been developed to avoid impacting all identified features and the construction works will be completed subject to a Cultural Heritage Management Plan (CHMP) (entered into between the Djiru People and DSDMIP/TMR) to ensure these and any unidentified features are protected.

Table 4-4 presents an assessment of all cultural and natural heritage values of the Clump Point area based on the Girrigun Aboriginal Corporation study (GAC, 2007) and the Cassowary Coast Foreshore Management Plan (BMT WBM, 2015).

Table 4-4 Assessment of cultural and natural heritage values in the Project area

Cultural item	Significance assessment	
	Indigenous	Scientific
Cultural values		
Djiru – part of unique rainforest culture	High significance	High significance
Clump Point area	Very high significance	Medium significance
Clump Point fish traps (FM:B42 and B44)	High significance	High significance
Clump Point ceremony grounds (FM:B43)	Very high significance	High significance
Shell and artefact scatters	Medium significance	Medium significance
Natural values		
Clump Point basalt formations	High significance	Very high significance
Cassowary	Very high significance	Very high significance
Rainforest precinct	Very high significance	Very high significance
Seagrass	Very high significance	Very high significance

Aside from these features and the Great Barrier Reef, there are no areas of non-indigenous cultural heritage in the Project area. Clump Point boat ramp is understood to have local significance as the 'gateway' to the Great Barrier Reef and Dunk Island and thereby has local maritime importance. This is not formally recognised, however, under any heritage register.

The Cutten Brothers walking track, which passes through the Project area at the junction of Alexander Drive and Clump Point Road, is also of indigenous and local cultural heritage significance. This track reflects on historical development transition in the area.

In addition, marine ecology surveys conducted in July 2016 identified a shipwreck within Boat Bay (BMT WBM, 2016a). This wreck has not been identified on the national shipwreck database but is still an item of historical heritage significance for the area.

5. Approval and Legislative Requirements

5.1 Permits and Approvals

As noted in Section 1.3, project works will be undertaken under the following approvals:

- Permit G18/39785.1 and DP 1711-2484 SDA – relate specifically to construction works.
- Sanction 300325 (72), EA EPPR74016 and AQM ENAQ06648916, and additional Permit for GBRMPA/GBR Coast MP - G18/38869.1 – relate to removal of siltation material associated with access to the boat ramps.

These permits establish a management and reporting regime for the project, as summarised in Table 5-1.

Table 5-1 Approval Regime for Construction Works

Permit	Management regime relevant to construction works
G18/39785.1	• Construction works must be undertaken subject to an approved CEMP and a Schedule of Works • GBRMPA can appoint an Environmental Site Supervisor to supervise construction works and direct works to be stopped, suspended or modified as required to prevent environmental harm • All instances of protected species injury/mortality or of other incidents to be reported to GBRMPA
1711-2484 SDA	• Marine plant disturbance works must be avoided between November and February • Construction works must be undertaken subject to a CEMP • Construction works must meet specific environmental performance outcomes for soil
300325 (72)	N/A – establishes extent of approved works that can be maintained
EPPR74016	• Dredging of siltation is limited to that required to maintain the *existing* boat ramp access channel • Works must be undertaken subject to written procedures • Works must meet specific environmental performance outcomes for air, land, surface water and waste
ENAQ06648916	• Dredging of siltation is limited to 1,500 m^3/yr from *existing* boat ramp access channel to a depth of -2.41 m AHD

The works were also subject to a referral under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). This identified that the Project (as referred) is not a controlled action under the Act and therefore did not require further approval. Any significant changes to the Project may trigger the need for re-assessment through the referral process, if there are implications to Matters of National Environmental Significance (MNES).

5.2 Statutory Duties

Additional to approval requirements, construction works need to meet statutory duties and management regimes under the following instruments:

- EPBC Act (as supported by relevant policy statements);
- *Great Barrier Reef Marine Park Act 1975* (Cth) (GBRMP Act), *Marine Parks Act 2004* (Qld), Great Barrier Reef Marine Park Zoning Plan (Cth) (GBRMP Zoning Plan) and relevant policies;
- *Environmental Protection Act 1994* (Qld) (EP Act) and environmental protection policies (EPPs);
- *Aboriginal Cultural Heritage Act 2003* (Qld) (ACH Act) and duty of care guidelines;
- *Transport Operations (Marine Pollution) Act 1995* (Qld) (TOMP Act) and *Transport Operations (Marine Safety) Act 1994* (Qld) (TOMS Act); and
- *Planning Act 2016*, as supported by EP Act, *Coastal Protection and Management Act 1995* (CPM Act), *Fisheries Act 1994* (Qld) and *Vegetation Management Act 2009* (VM Act).

The duties/regimes imposed under these instruments are summarised in 2. The performance criteria for the Project area are established under the EP Act and EPPs based on environmental values (EVs) and quality objectives for water (WQOs), noise and air.

Table 5-3 describes these in the context of water quality.

Table 5-2 Statutory Duties and Management Regime for Construction Works

Instrument	Management regime and environmental duties
EPBC Act	• Construction works must not cause significant impact to any MNES. This is of particular relevance to: ○ Marine megafauna (e.g. turtles, dolphins, dugongs) – at risk of vessel strike ○ Southern cassowary – at risk of vehicle strike ○ Threatened flora – at risk of accidental clearing
GBRMP instruments	• Construction works must be undertaken subject to this EMP • GBRMPA must be notified of works prior to commencement • Structures to be installed in the GBRMP must not be treated with toxic compounds (e.g. anti-fouling paints containing tributyltin) • Clean-up equipment must be maintained on site if fuel or hazardous substances will be stored • Installation of moorings must be supervised by an authorised person and undertaken in accordance with best practice • After installation of moorings, a compliance certificate for the mooring must be obtained
EP Act and EPPs	• General duty to take reasonable care to avoid environmental harm • Except where alternative performance outcomes are established through DPs/EAs or negotiated with DES, works must meet objectives for water quality, noise and air as set under EPPs

ACH Act and duty of care guidelines	• Except where a CHMP, native title agreement or other specific agreement is in place, works must comply with cultural heritage duty of care guidelines, including: ○ Taking reasonable care to not damage any known or unknown cultural heritage items ○ Undertaking a cultural heritage assessment for clearing and ground-disturbance works ○ Entering into a management agreement with the relevant Aboriginal Party (i.e. the Djiru People) for any cultural heritage items found before construction ○ This construction project is to be completed under a Cultural Heritage Management Plan
TOMP and TOMS Acts	• Works involving a disruption to navigation must be notified with Regional Harbour Master and subject to Notice to Mariners • In water works must be undertaken to avoid risks to maritime safety • In water and onshore works must be undertaken to avoid risk of marine pollution.
Planning Act	• Construction works are limited to extent of DP; any additional activities that constitute 'development' (e.g. clearing, tidal works, marine plant disturbance) will require a new or amended DP.

Table 5-3 Relevant EVs and WQOs for local waters in Project area

Parameter	Boat Bay WQOs*	Open coastal waters WQOs*
Aquatic ecosystem EVs		
Dissolved oxygen	85-105% saturation	95 / 100 / 105% saturation
pH	6.5 / 7.3 / 8.4	8.1 / 8.3 / 8.4
Ammonia nitrogen	<15 µg/L	1 / 3/ 7 µg/L
Oxidised nitrogen	nd	0 /0 /1 µg/L
Particulate nitrogen	nd	≤20 µg/L
Organic nitrogen	135 µg/L	nd
Total nitrogen	160 µg/L	76 / 105 / 140 µg/L
Filterable reactive phosphorus	5 µg/L	0 / 2 / 3 µg/L
Particulate phosphorus	nd	≤2.8 µg/L
Total phosphorus	20 µg/L	8 / 14 / 22 µg/L
Chlorophyll-a	2.0 µg/L	<0.45 µg/L
Turbidity	10 NTU	0.6 / 0.9 / 1.8 NTU
Secchi depth	1.0 m	≥10 m
Total suspended solids (TSS)	nd	≤2 mg/L

*Where three WQOs are provided, this represents the 20th, 50th and 80th percentiles.

5.3 Project Impacts

The construction phase impacts for the Project can be considered within two categories:

(1) Direct impacts associated with the loss of habitat within the infrastructure footprints; and

(2) Other impacts (direct and indirect) associated with construction activities, including loss of habitat outside of the infrastructure footprints that can be rehabilitated.

Figure 4-4 to Figure 4-6 show the details of habitat lost within the footprint of proposed Project infrastructure. This includes:

- Small patches of fringing coral assemblages within the footprint of the new breakwater;
- Part of the Clump Point reef and intertidal zone within the footprint of the existing breakwater upgrade;
- Soft sediment (sand and mud) within the footprint of the new breakwater and the boat ramp expansion;
- Mangrove communities within the footprint of the expanded carpark and roadway; and
- Highly fragmented littoral rainforest communities within the footprint of the expanded carpark and roadway (representing a small extension on what has been previously approved for upgrade works).

In addition to these existing values, there is also the potential for seagrass to re-colonise areas within the footprint of proposed maritime structures (e.g. new breakwater, boat ramp expansion). Figure 4-4 shows historical seagrass meadows that have been recorded at Clump Point that overlap with these proposed structures; these areas are considered to represent potential seagrass habitat.

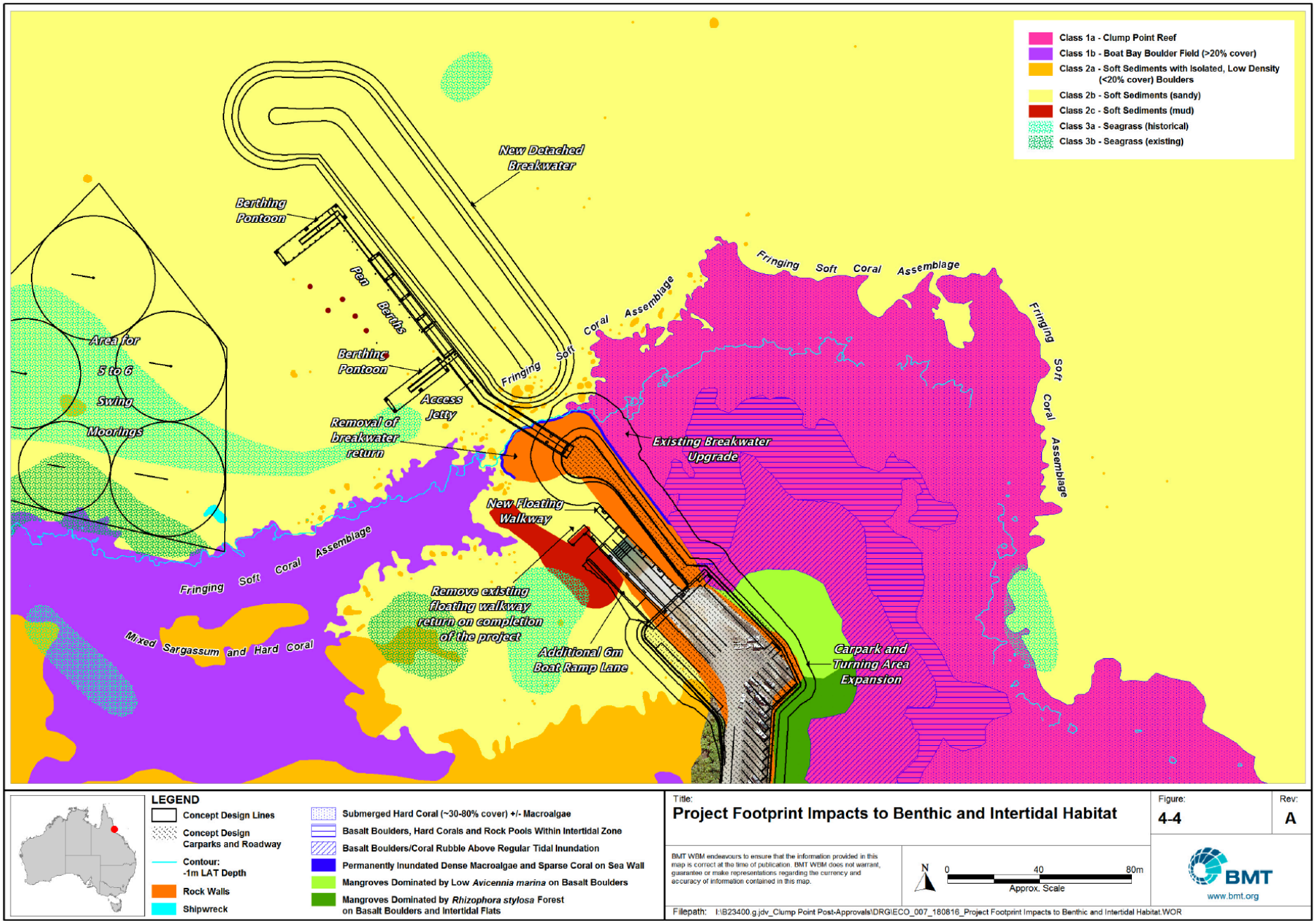
The proposed Project footprint does not require the removal or translocation of existing bommies. Figure 4-7 shows the location of the bommies closest to the proposed structures. These bommies may be impacted by construction phase activities, however, MGN will place identifying markers in the form of small buoys and implement a ‘go slow’ construction process with a spotter through this area to minimise impact. The eastern carpark reclamation will impact on the existing basalt boulder field. However, specific feature rocks will be relocated prior to reclamation works and placed at the toe of the new revetment to remain a visible part of the basalt field aesthetic.

Other potential impacts from the construction of the Project consist of the following:

- Generation of turbid plumes (causing impacts to sensitive receptors in the marine environment) because of rock placement (if material is dirty), removal of the breakwater return, and excavation in the intertidal zone, excavation of the buried toe of the existing breakwater, excavation and stockpiling in the supratidal zone (where storm water mobilises sediment), and excavation in the intertidal and subtidal zone of the reclamation footprint.
- Discharge of other contaminants, including hydrocarbons, into the marine environment (due to storm water).
- Underwater noise and vibration impacts to underwater fauna associated with construction activities.
- Spread of weeds associated with introducing soil/rock material and/or construction equipment.
- Construction traffic, increasing risk of accident, including strike of animals crossing Clump Point Road and access routes to the site.

- Complete closure of the boat ramp and associated facilities.
- Temporary loss of access to existing infrastructure.
- Potential PASS/ASS oxidation (if disturbed)

No impact to the Clump Point fish trap is expected to occur as a result of the Project as works have been designed to avoid overlap with this area. None of the above impacts, where relevant to MNES (e.g. federally listed threatened species and communities, GBRMP) are expected to be significant based on an EPBC Act referral made in April 2017 and as confirmed by the Department's response to this referral.


Class 1a - Clump Point Reef
Class 1b - Boat Bay Boulder Field (>20% cover)
Class 2a - Soft Sediments with Isolated, Low Density (<20% cover) Boulders
Class 2b - Soft Sediments (sandy)
Class 2c - Soft Sediments (mud)
Class 3a - Seagrass (historical)
Class 3b - Seagrass (existing)
New Detached Breakwater
Berthing Pontoon
Pen
Berths
Berthing Pontoon
Access Jetty
Area for 5 to 6 Swing Moorings
Removal of breakwater return
Existing Breakwater Upgrade
New Floating Walkway
Remove existing floating walkway return on completion of the project
Additional 6m Boat Ramp Lane
Carpark and Turning Area Expansion
Fringing Soft Coral Assemblage
Mixed Sargassum and Hard Coral
LEGEND
Concept Design Lines
Concept Design Carparks and Roadway
Contour: -1m LAT Depth
Rock Walls
Shipwreck
Submerged Hard Coral (~30-80% cover) +/- Macroalgae
Basalt Boulders, Hard Corals and Rock Pools Within Intertidal Zone
Basalt Boulders/Coral Rubble Above Regular Tidal Inundation
Permanently Inundated Dense Macroalgae and Sparse Coral on Sea Wall
Mangroves Dominated by Low Avicennia marina on Basalt Boulders
Mangroves Dominated by Rhizophora stylosa Forest on Basalt Boulders and Intertidal Flats
Title:
Project Footprint Impacts to Benthic and Intertidal Habitat
Figure: 4-4
Rev: A
BMT WBM endeavours to ensure that the information provided in this map is correct at the time of publication. BMT WBM does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.
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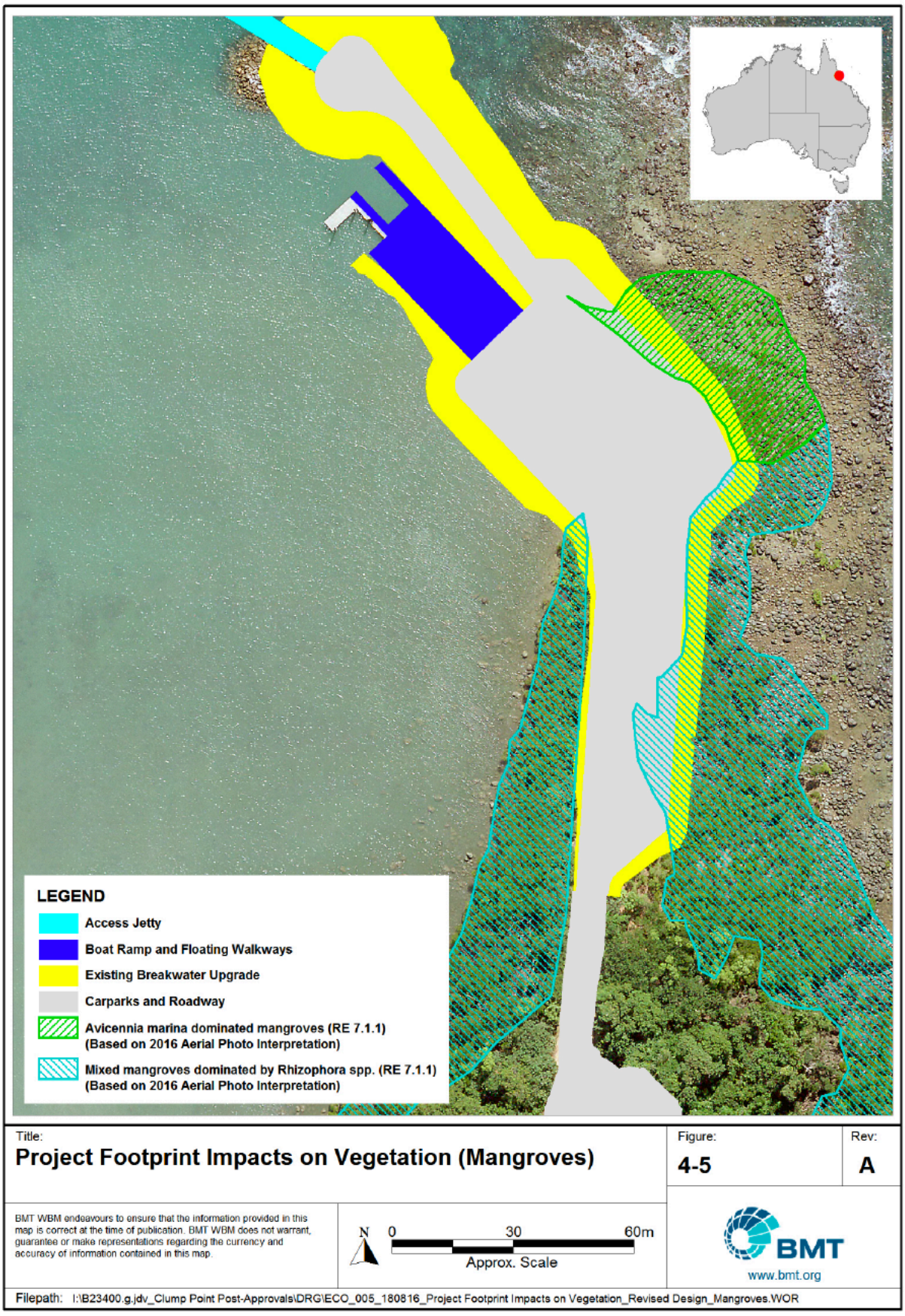
LEGEND
Access Jetty
Boat Ramp and Floating Walkways
Existing Breakwater Upgrade
Carparks and Roadway
Avicennia marina dominated mangroves (RE 7.1.1)
(Based on 2016 Aerial Photo Interpretation)
Mixed mangroves dominated by Rhizophora spp. (RE 7.1.1)
(Based on 2016 Aerial Photo Interpretation)
Title:
Project Footprint Impacts on Vegetation (Mangroves)
Figure:
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Rev:
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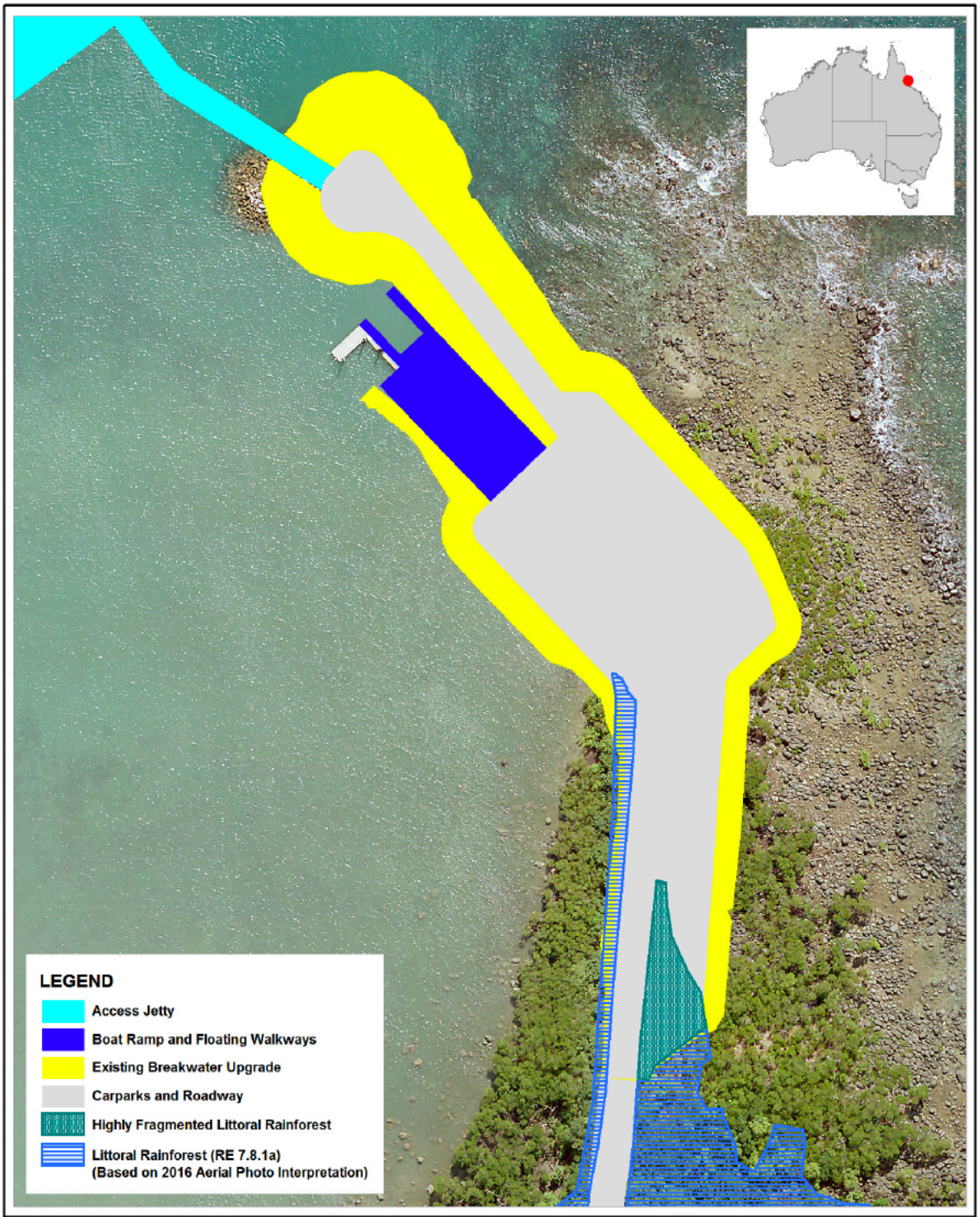

Title:
Project Footprint Impacts on Vegetation (Littoral Rainforest)

Figure: **4-6**

Rev: **A**

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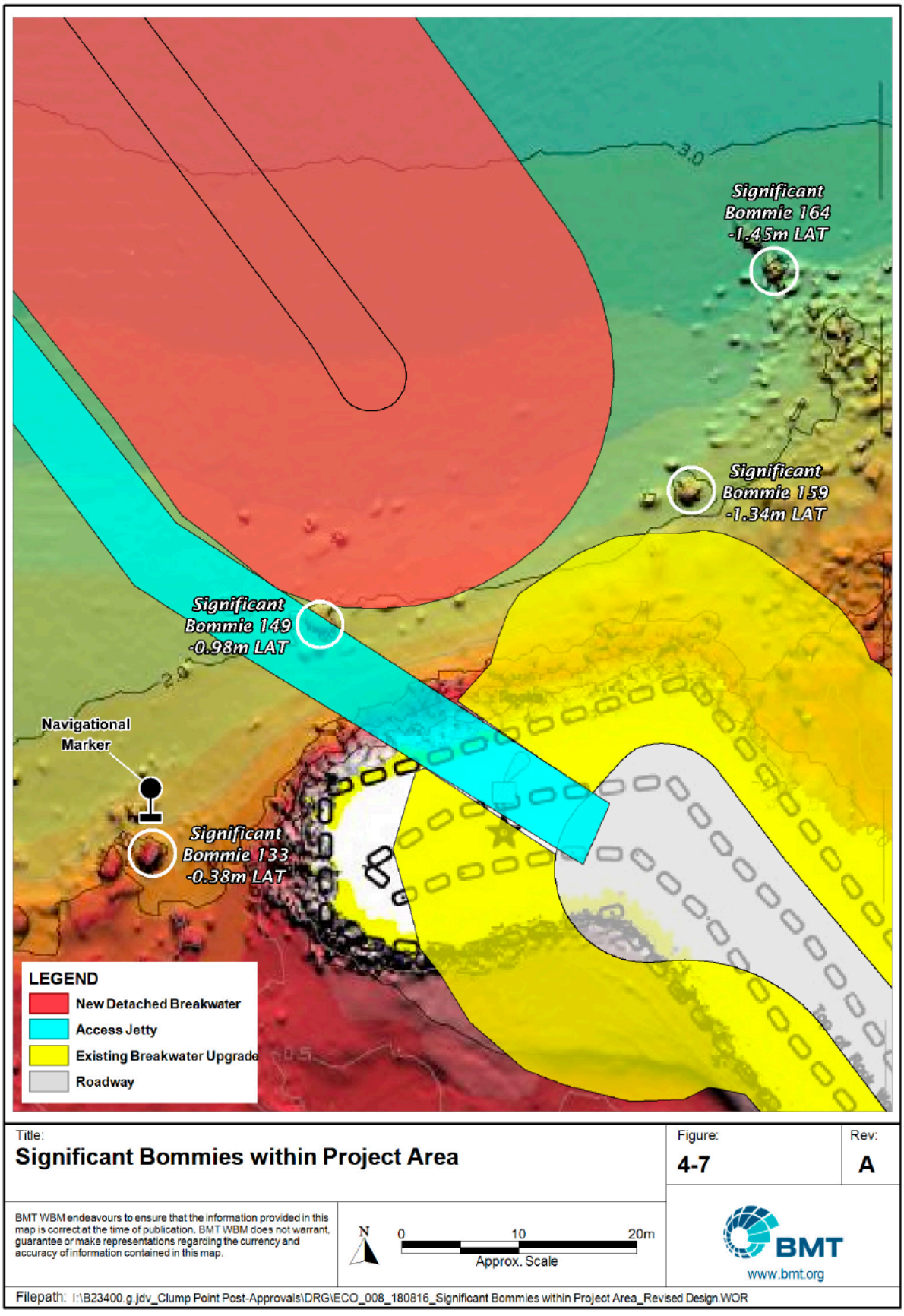
Significant Bommie 164 -1.45m LAT
Significant Bommie 159 -1.34m LAT
Significant Bommie 149 -0.98m LAT
Navigational Marker
Significant Bommie 133 -0.38m LAT
3.0
2.0
LEGEND
New Detached Breakwater
Access Jetty
Existing Breakwater Upgrade
Roadway
Title:
Significant Bommies within Project Area
Figure:
4-7
Rev:
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6. Environmental Management Elements

This Section provides a description of the environmental management actions that will be undertaken during construction phase to avoid and mitigate potential environmental impacts. It includes Project-wide considerations (i.e. those related to design, methodology, timing etc.) and individual management elements focusing on specific environmental values.

For each individual management element, the following have been defined:

Objective	The overall outcome intended to be achieved for that element; typically linked to minimising/avoiding environmental impacts and achieving compliance with statutory/approval requirements
Performance Criteria	Nominated criteria that, if met, indicate the Objective of the element has been achieved
Management Documents	Management Plans or further studies that have been developed by the MGN Civil (or other party) to expand on process to minimise negative impacts.
Management	Nominated management actions that represent the preferred way in which Performance Criteria and Objectives for the element can be met.
Monitoring	Actions to measure whether or not Performance Criteria have been achieved
Reporting and Auditing	Requirements to continually review management actions, check compliance with statutory/approval requirements
Corrective Action	Actions to be taken if monitoring indicates that Performance Criteria are not being met

The individual management elements for the CEMP consist of the following:

- Water quality (including turbidity and ASS);
- Marine benthic habitat;
- Marine megafauna;
- Mangroves and littoral rainforest;
- Terrestrial flora and fauna;
- Traffic;
- Cultural heritage;
- Dust and noise; and
- Spills and waste management.

6.1 Project wide

In order to mitigate impacts from the construction phase of the Project and to achieve the policy and code requirements discussed in Section 5.3, the following principles will govern construction activities:

- Marine plant clearing works will be undertaken outside of November to February, with the bulk of all works occurring during winter months to avoid the risks associated with summer storms and tropical cyclones. Refer to Appendix K Severe Weather Management Plan.
- During the construction phase, MGN will construct a temporary causeway using a single row of 1,800 (w) x 600 (h) box concrete culverts. This will provide access from the existing break water to the new detached breakwater. These box culverts provide a cross sectional area of 1.08m2. This will ensure construction works do not lead to temporary 'reclamation' of the GBRMP.
- All construction stockpiles and laydown areas will be established on already disturbed areas outside of the tidal influences (existing car park south of boat ramp).
- Erosion and Sediment Control (ESC) Plan Appendix C and Storm water Management Plan Appendix D are certified by an RPEQ.
- Access to the site will be provided at all times to an Environmental Site Supervisor appointed by GBRMPA, and any other compliance officer as required by other Assessing Agencies.

A monthly Environmental Performance Report (EPR) will be submitted by MGN Civil to the TMR Principal for review. The information required for the EPR is set out in the management elements below but includes;

- details of any works,
- management actions and monitoring undertaken, and
- environmental incidents occurring, within the reporting period.

All Environmental incidents will be reported to the TMR and GBRMPA with in 24 hours of the incident occurring,

The notification must include:

- details of the incident including date, time, location, cause and nature of the incident;
- the name and contact details of the person(s) witnessing, reporting and/or responsible for the incident;
- the type, estimated volume and concentration of any pollutants involved;
- measures taken or proposed to be taken to manage the impact and the success of those measures in addressing the incident; and
- details of any monitoring and reporting that will be undertaken.

The TMR Project Engineer will conduct at least one audit of the site during the construction phase to ensure compliance with the CEMP and Project approvals.

6.2 Water Quality

As mentioned in Section 5.3, storm water runoff from land-based areas at Clump Point are expected to discharge by sheet flow into the marine environment. As a result, construction phase activities that disturb sediment and/or introduce contaminants to the Project area could cause impacts to marine water quality through uncontrolled storm water discharge. These activities include earthworks, stockpiling of material, excavation, and clearing vegetation, as well as the risk of spills associated with construction equipment and vehicles.

Earthworks within areas containing Acid Sulfate Soils (ASS) (highly unlikely) may also lead to the exposure and oxidization of acidic material, which could be discharged into the marine environment. Where excavation is undertaken in intertidal or subtidal waters, sediment, including ASS and/or contaminated material, could resuspend into marine waters. Any material stockpiled from this excavation can also cause turbidity impacts associated with the discharge of tailwater settling from the stockpile.

In addition to land-based discharges, works within the marine environment have the potential to disturb benthic sediment, causing turbidity impacts to water quality. This includes placement of new rock material and the removal of existing rock material.

Impacts to water quality have the potential to cause connected impacts to marine ecology values, especially associated with sensitive receptors. Based on these risks, the WQOs from Table 4-7 (necessary for supporting aquatic ecosystems) that could be affected by construction activities (where unmitigated) are:

- pH;
- Turbidity;
- Secchi depth; and
- TSS.

Management measures for these impacts are set out in Table 5-1 below. Measures related to the control of spills, waste and hazardous materials are discussed in Section 6.10.

The management objective for the water quality element is:

No impact to aquatic ecology EVs in Boat Bay and nearby open coastal waters

This management objective is governed by the EPP (Water) and reflects requirements of the EP Act, Marine Parks Act and GBRMP Act.

Table 6-1 Management measures for water quality (turbidity)

Objective	No impact to aquatic ecology EVs in Boat Bay and nearby open coastal waters		
Performance Criteria	• WQOs for Boat Bay and open coastal waters are met throughout the construction phase • ESC installations remain fit-for-purpose throughout the construction phase • No net worsening of storm water quality • No collapse or evidence of significant erosion from stockpiles • No generation of visual turbid plumes greater than >10 m from works areas		
Management Documents		**Responsibility**	
Erosion and Sediment Control Plan Appendix C. This plan has been developed in accordance with: • FNQROC Development Manual • IECA Best Practice Erosion and Sediment Control 2008 • TMR Environmental Management Policies		*Preparation*: MGN Civil *Certification*: RPEQ *Approval*: TMR	
Storm Water Management Plan Appendix D. This plan has been developed in accordance with: • Queensland Urban Drainage Manual.		*Preparation*: MGN Civil *Certification*: RPEQ *Approval*: TMR	
Water Quality Monitoring Program Appendix E		MGN Civil, using a qualified Water Quality Scientist	
Refueling Management Plan Appendix F		*Preparation*: MGN Civil *Approval*: TMR	
Management		**Responsibility**	**Timing**
Erosion and Sediment Control key management actions: • Prior to commencement of construction activities, ESC installations required for the works under the ESC Plan will be installed and checked for compliance by the Project Engineer. • ESC installations must be retained in a state that meets the requirements of the ESC Plan at all times during the construction phase. • Both on-land and in-water all works will be undertaken using equipment that is appropriately sized for the relevant works completed in a way that minimises the risk of disturbance of soils. Refer to Construction Methodology. • Bunding must be put in place around any stockpiles retained on site except where it is established there is not risk of contaminated or sediment-laden runoff being generated from the stockpile (e.g. clean rock material). • Only clean rock material (that will not cause a turbid plume) can be used for construction of the breakwater. • Achieved by stockpiling at quarry and stored for a minimum 1 month. This allows wind and rain to remove the fines. • Alternate option will be to wash/spray using quarry water supply or pre-approved council stand pipes.		MGN Civil Project Engineer	At all times
Storm Water key management actions: • Works that can cause pollutant run off to be scheduled around favorable climatic conditions. • Pre and post storm events inspection and preparations of controls.		MGN Civil Project Manager	At all times

Water Quality Monitoring Program key management actions: • MGN Staff trained by professional Water Scientist on water collection methods prior to works being undertaken. • Water Quality Monitoring to ensure works meet water quality objectives outlined in plan. • Water quality sample testing triggered by after weather events.	MGN Civil Engineer	As per Monitoring Program
Refueling key management actions: • all refueling/ minor maintenance to be conducted in area at least 25m from the nearest waterway. • Appropriate spill response equipment must be maintained on site at all times and all MGN Civil Staff are to be trained in the use of spill response equipment and actions to be taken in event of small and large spills.	MGN Civil Construction Manager	At all times
Acid Sulfate Soils key management actions: • Material removed from the intertidal or subtidal environment must be disposed of at a licenced land-based disposal facility. • Any excavation in intertidal and subtidal areas must occur at low tide. • Any material removed from intertidal and subtidal areas must be treated and mixed immediately with material to create a composite suitable for disposal at a licenced facility. • MGN will mix with locally sourced saw dust or clean fill. • Mixed with 50T digger, to solid consistency. • Carted away using 22T side tipping trucks. • Sediment sampling data shows that the material being removed is self-neutralizing and for this reason does not present an ASS risk. However, as an additional precautionary measure the pH of seepage water from the temporary stockpile will be tested. If below 6.5 additional NATA testing will occur.	MGN Civil Construction Manager	At all times
Monitoring	• Monitoring to be undertaken by MGN Civil Project Manager and Project Engineer in accordance with the Quality Plan, ESC Plan, Stormwater Management Plan and Water Quality Monitoring Program. • Water quality monitoring to be completed by NRA Environmental, until MGN Civil staff are trained and competent. At this time MGN Civil will undertake all monitoring. • Daily visual inspections of ESC installations by MGN Civil Construction Manager to ensure structures meet ESC Plan requirements, with additional inspections immediately before and after significant rainfall events. • Daily inspection of stockpiles by MGN Civil Construction Manager to identify evidence of collapse or erosion, with additional inspections immediately before and after significant rainfall events. • Daily monitoring of seepage water pH will be undertaken for excavated material from the intertidal areas the duration of the works. In the very unlikely event a pH drop is monitored below 6.5 the contractor will bund off the area (to contain seepage water) and apply a lime guard layer around the temporary stockpile to ensure release water pH is maintained above 6.5. If this occurs 4 samples will be collected and tested at a NATA approved lab and the material will be lime treated and verified in accordance with the QLD ASS Lab Guidelines and Technical Manual before the soil is permanently removed.	

Auditing and Reporting	• Ongoing visual monitoring of marine water quality by MGN Civil Staff during in-water works and works in the intertidal area to identify and track turbid plumes.
	• Auditing and reporting to be undertaken by MGN Civil in accordance with the Quality Plan, ESC Plan, Stormwater Management Plan and Water Quality Monitoring Program. • EPR to be prepared by MGN Civil Superintendent at end of every month, including details on a) performance of ESC installations, b) compliance with Quality Plan, c) compliance with ESC Plan, Stormwater Management Plan and Water Quality Monitoring Program, d) results of monitoring, including water quality monitoring, e) any environmental incidents, including spills, and management actions taken, and f) any significant rainfall and/or runoff events during the reporting period. • MGN Civil Project Manager to conduct at least one audit of the Project area during the construction phase to test compliance with the CEMP.

Corrective Action	Responsibility	Timing
• Notify TMR within 24 hours of incident. • Treat impacts from failed installations and/or collapsed stockpiles. • Identify cause of impact and upgrade or modify management actions, including those in the ESC Plan, ASS Management Plan and/or Stormwater Management Plan as required. • Regrade or relocate stockpiles as required.	MGN Civil Project Manager	Immediately after impact is identified
• Notify relevant assessment agencies • Review and approve any amended ESC Plan, ASS Management Plan and/or Stormwater Management Plan for the Project Area • Conduct audit of the Project area to ensure compliance with new plans/management actions	TMR	Immediately upon notification

6.3 Marine Benthic Habitat

The construction works have the potential to impact on several environmentally important and/or iconic benthic habitat features in the Project area through the following:

- Construction of the new breakwater in close proximity to significant bommies and over the basalt boulder field.
- Change to water quality conditions due to ground disturbance and construction site runoff, leading to impacts to sensitive receptors (e.g. seagrass, corals) – NOTE: This impact will be managed through water quality management measures, as discussed in Section 6.2.

Construction of the new breakwater, including the temporary construction-phase causeway, has the potential to impact on significant bommies outside the footprint of these structures. The highest risk impact is direct placement of rock material or other objects directly atop the bommies, either causing burial (if completely covered) or damage to the bommie and associated coral communities. Bommies are important habitat features for the area and are to be retained.

Part of the works footprint also overlaps with the Clump Point basalt boulder field. Due to the aesthetic and cultural heritage significance of this area, select basalt boulders will be temporarily relocated prior to the eastern reclamation works and then placed at the toe of the new revetment structure to maintain the connection to the existing field.

The works also provide an opportunity to improve local benthic habitat values through removal of maritime debris. Specifically, the works will involve removal of the anchor chain(s) from coral reef in the Project area and general debris, unless this will cause greater environmental impacts (e.g. where coral has encrusted on anchor chains). Removal of these elements may require associated rehabilitation works, depending on the extent of existing damage and any damage consequential to the removal works. The floating walkway module within the mangroves has been removed by CCRC.

The management objective for the marine benthic habitat element is:

No loss of significant benthic habitat features as a result of construction activities

This management objective is governed by the EP Act and Fisheries Act and reflects requirements of the Marine Parks Act and GBRMP Act.

Table 6-2 Management measures for marine benthic habitat

Objective	No loss of significant benthic habitat features as a result of construction activities
Performance Criteria	• No loss of seagrass meadow or coral reef extent attributable to construction works, other than within infrastructure footprint • No loss of significant bommies • Retention of significant basalt boulder features

Management Documents	**Responsibility**	
Pre-construction seagrass and coral reef baseline, including mapping of boundary of meadows and reefs with differential GPS. Survey includes identification of marine debris and anchor chains requirement removal/rehabilitation.	TMR, using a qualified ecologist	
Project Construction Methodology Appendix B identifies process for basalt boulder recording, excavation, stockpiling and subsequent reuse.	MGN Civil	
Management	**Responsibility**	**Timing**
Bommie key management actions: • Clearly demarcate Bommies with floating buoys. • Use of a spotter to provide greater visual certainty with rock placement when close to bommie. • No tipping of rock in this area, only placement by excavator. Works in this area completed on lowering tides for improved visibility.	MGN Civil	Prior to works
Basalt Boulder key management actions: • Identified impacted Basalt Boulders, record location using GPS. • Extract Boulders at low tide that will be reused, using 50T Excavator. • Temporarily stock pile boulders in existing carpark. • Reuse by placing with 50T Excavator at toe of new revetment.	MGN Civil	At all times
Undertake all actions in accordance with Water Quality element (Section 6.2).	As per Water Quality element	As per Water Quality element
Undertake all actions in accordance with Spills and Waste Management element (Section 6.10).	As per Spills and Waste Management element	As per Spills and Waste Management element
Remove maritime debris in accordance with approved methodology and dispose of at an appropriately licenced facility.	MGN Civil/TMR	As per approved methodology following pre-works surveys
Rehabilitate any impacts associated with maritime debris and/or debris removal process in accordance with the approved methodology.	MGN Civil/TMR	As per approved methodology

		following pre-works surveys
Monitoring	• Monitoring to be undertaken by MGN Civil Superintendent in accordance with Quality Plan and Water Quality Monitoring Plan and Spills and Waste Management element of the CEMP. • Daily visual inspections of works area by MGN Civil Construction Manager to (a) ensure construction works are not being undertaken in zones of significant benthic features, and (b) any boulders for relocation are being suitably protected. • Inspection of marine debris removal areas by MGN Civil Construction Manager after removal and throughout remediation activities (if any) • Post-works survey of coral reef, seagrass meadows, bommies and basalt boulder field by MGN Civil Project Manager (utilising a suitably qualified ecologist) to identify any changes comparative to baseline conditions.	
Auditing and Reporting	• Auditing and reporting to be undertaken by MGN Civil Project Manager in accordance with the Quality Plan and relevant plan of the Water Quality element and Spills and Waste Management element of the CEMP. • EPR to be prepared by the MGN Civil Superintendent at end of every month including details on a) protection of benthic habitat features, b) compliance with Quality Plan, c) results of monitoring, and d) environmental incidents and management actions taken. • Principal and/or Project Engineer (or delegates) to conduct at least one audit of the Project area during the construction phase to test compliance with the CEMP	
Corrective Action		**Responsibility**	**Timing**
• Notify TMR immediately • Remove any material from buffer zones, except where such removal will cause additional impacts • Cease all placement works • Remediate damage to benthic habitat features and areas affected by marine debris removal • Reassess construction methodology and buffer zone		MGN Civil Project Manager	Immediately after impact is identified
• Notify relevant assessment agencies • Review and approve any amended methodology • Supervise remediation works • Conduct audit of the Project area to ensure compliance with new methodology		TMR	Immediately upon notification

6.4 Marine Megafauna

The placement of rock material for breakwater construction as well as any vessel traffic associated with water-based works, pose risks to marine megafauna (i.e. cetaceans, dugong, sharks, marine turtles). These relate to the risk of direct strike and vibration. As many marine megafauna species are threatened, management of these potential risks is considered of high importance.

While works will occur outside of turtle nesting season measures will be implemented as a precaution.

Management measures related to these impacts are described in Table 6-3. The management objective for the marine megafauna element is:

No impacts to marine megafauna species as a result of construction activities

This management objective is governed by the EP Act and reflects requirements of the Marine Parks Act and GBRMP Act.

Table 6-3 Management measures for marine megafauna

Objective	No impacts to marine megafauna species as a result of construction activities
Performance Criteria	• No injury/mortality of marine megafauna

Management Documentation	**Responsibility**
n/a	

Management	**Responsibility**	**Timing**
All marine works must be conducted only during daylight hours. 7am-5pm.	MGN Civil Construction Manager	At all times
Pre-start and ongoing visual inspections of the works area must be conducted during rock placement on the new detached breakwater and underwater excavations by the excavator operator, designated spotter and all other MGN employees engaged in works near water. This observation zone for marine megafauna will cover a 500m radius around the new detached breakwater. The spotter will use natural land features to line up the observation zone. If marine megafauna is sighted within the works area, potentially harmful marine activities must be stopped until animals have moved away from the construction area.	MGN Civil Construction Manager	During rock placement and underwater excavations.
If marine megafauna is sighted within the observation zone during underwater excavation or rock activities, works must be delayed until animals have been observed to move away outside the zone or, if they are no longer observable, 10 minutes after the last sighting within the zone.	MGN Civil Construction Manager	At all times
Construction activities will be planned and executed to minimise and avoid interactions with marine mammals and turtles, including: • Construction vessel (small tinny, for the laying of geofabric and laying marker buoys) operational buffers of 100m from large cetaceans and 50m from dolphins • No-wash speed limits within 100m of whales or 50m from dolphins • 'Go-slow' 4 knots limit for construction vessels near seagrass and reef areas	MGN Civil Construction Manager	At all times
Noise: • Water-based noise activities (e.g. underwater excavation or rock placement) must be commenced gradually (soft start) to provide warning to nearby marine megafauna. • Soft start procedure involves the machine starting and left in idle mode for up to 10 minutes prior to works begin. If on rock walls the bumping of in-situ rocks with excavator bucket to create moderate noise in preparation for works to begin.	MGN Civil Construction Manager	At all times
Spotter: • MGN will engage the services of a local spotter (TBA) familiar with the types of fauna that may be present in the area. This person is to maintain regular eye contact of the work zone and the 500m radius observation zone, from a vantage point that can easily see all of the observation zone. • The spotter will be engaged for all rock construction and underwater activities where there is an increased risk. • MGN to provide name and contact details to GBRMPA prior to on ground activities commencing.	MGN Project Manager	During rock placement and underwater excavations. Engagement of suitable spotter TBA.

• If details of spotter change through the project these details will be updated with GBRMPA.		

Monitoring	• Daily ongoing monitoring to be undertaken by an MGN Civil employed spotter during all rock works and underwater excavations on the existing and new detached breakwater. • All MGN employees /sub-contractors have the responsibility to check 'spot' for marine fauna if their works may negatively impact.
Auditing and Reporting	• MGN to notify GBRMPA, if a protected species is found injured or dead within 300 metres of the permitted works, no later than 24 hours after the protected species is found. If works are underway at the time, MGN must further ensure that: • all use of equipment that may have contributed to the injury or death of the protected species ceases immediately; • an assessment is made of the cause of the incident and a report submitted to the Managing Agency; • additional measures are incorporated into the relevant Environmental Management Plan or Schedule of Works to minimise the risks identified; and • the works do not resume without the approval of the Managing Agency. • Any sightings of marine megafauna in the works area or adjacent environments during construction must be reported. These records will be reported in the client monthly Environmental Report, and

	any incident of harm reported to the EHP Hotline (1300 130 372). • EPR to be prepared by MGN Civil Superintendent at end of every month, including details on a) compliance with Quality Plan, b) sightings of marine megafauna, including description of behaviour, and c) actions taken upon sighting of marine megafauna (e.g. stop works), within the reporting period. • Principal and/or Project Engineer (or delegates) to conduct at least one audit of the Project area during the construction phase to test compliance with the CEMP.

Corrective Action	Responsibility	Timing
• Notify TMR • Identify cause of the marine megafauna injury/mortality and amend management plan to address this cause.	MGN Civil Project Manager	Immediately after impact is identified
• Notify EHP and GBRMPA • Review and approve any amended management plan element • Conduct audit of the Project area to ensure compliance with new plans/management actions	TMR	Immediately upon notification

6.5 Mangroves and Littoral Rainforest

Upgrade of the existing breakwater and expansion of the road and carpark will require clearing of areas of vegetation. These areas are all currently mapped as RE 7.1.1 (mangrove forest) although ground-truthing has identified littoral rainforest (RE7.8.1a) within a narrow strip on the western side of Clump Point Road. Notably, none of this vegetation is known to contain threatened flora species or to provide Essential Habitat or other habitat features for threatened fauna species.

Areas adjoining infrastructure footprints may also require some clearing as part of construction activities but would be subject to rehabilitation at the end of the construction phase.

In addition to clearing impacts, works can cause the introduction of invasive species into vegetation communities. These can be introduced through imported rock/soil material and on construction equipment. Clearing also causes a change in light regimes for adjoining areas.

Management measures related to these impacts are described in Table 6-4. Measures related to the threatened species are described in Section 6.6.

The management objective for the mangroves and littoral rainforest element is:

> ***Vegetation communities, outside of Project footprint, are retained in a natural condition practicable and do not suffer community collapse***

This management objective is governed by the *VM Act* and *Fisheries Act* and reflects requirements of the *NC Act* and *EPBC Act*.

See also the Marine Benthic Habitat element (Section 6.3) regarding management of removing maritime debris from mangrove communities.

Table 6-4 Management measures for mangroves and littoral rainforest

Objective	Vegetation communities, outside of Project footprint, are retained in a natural condition practicable and do not suffer community collapse		
Performance Criteria	• No net loss of vegetation outside of Project footprint • No occurrence of new weeds or disease in adjoining vegetation.		
Management Documents		**Responsibility**	
A Vegetation Clearing Plan Appendix H has been prepared, identifying: • Areas of vegetation that will be permanently lost, areas that will be impacted but rehabilitated, and areas that will be retained. • Methodology for clearing, including staging and equipment to be used. • Measures for retaining topsoil and vegetation material for use in mulching. • Pre-Clearance Survey methodology		*Prepared by*: MGN Civil, using a qualified botanist/arborist *Approval*: TMR	
A Rehabilitation Plan contained within the Vegetation Clearing Plan has been prepared which includes; • the long-term rehabilitation objectives, • native species intended to be used for rehabilitation.		*Prepared by*: MGN Civil, using a qualified botanist/arborist *Approval*: TMR	
Management		**Responsibility**	**Timing**
A Pre-Clearance survey will be conducted for threatened species and habitat and Report will be conducted prior to any clearing works.		MGN Civil using a qualified botanist	Prior to Clearing
Two Djiru monitors will be engaged for the duration of the Pre-Clearance survey.		MGN Civil Project Manager	During Pre-Clearance Survey
Clearing must be undertaken in accordance with the approved Vegetation Clearing Plan.		MGN Civil Project Manager	At all times
Clearing boundaries are established using a qualified surveyor with appropriate signage at regular intervals and visible and physical markings (high visibility tape). Ensure that all operators undertaking these works are aware of these boundaries to ensure no unauthorised clearing occurs.		MGN Civil Project Manager	At all times
Mangroves will be cut off at ground level using hand tools leaving roots in situ to prevent disturbance to PASS.		MGN Civil Project Manager	At all times
Vegetation Clearing with in the southern carpark toilet block foot print will be completed using; • Dozer, and • Chainsaw operator		MGN Civil Construction Manager	During Vegetation Clearing
All topsoil disturbed during vegetation clearing will be retained in a bunded and covered stockpile on site and used for rehabilitation works.		MGN Civil Project Manager	Prior to rehabilitation
No vegetation will be burned as a form of removal or disposal.		MGN Civil Project Manager	At all times

Weed management will be undertaken during construction to ensure new weeds are not introduced to the area, including: • Mandatory weed wash down for vehicles and plant entering/existing the clearing area near site administration. • Limited vehicle and plant movements in known weed infested areas. • Only clean fill material that is certified as weed free (weed certificates to be retained) can be used in the project area.	MGN Civil Construction Manager	At all times
Any soil stockpiles to be located away from existing vegetation.	MGN Civil Construction Manager	At all times
Upon completion of works, areas for rehabilitation will be planted in accordance with the Rehabilitation Plan.	MGN Civil Project Manager	Following completion of works
Drainage from works area following works to be restored as close to pre-works condition as possible. Where not practicable, drainage to be designed to ensure no waterlogging and death of adjoining vegetation.	MGN Civil Construction Manager	During restoration works

Monitoring	• Weekly inspections of adjoining vegetation during and up to 3-month post-clearing works in order to identify evidence of weeds, disease and/or native vegetation mortality and feral animals on site. • MGN Civil Project Manager to undertake monitoring of rehabilitation sites as per the Rehabilitation Plan
Auditing and Reporting	• EPR to be prepared by MGN Civil Superintendent at end of every month, including details on a) compliance with Quality Plan, b) compliance with Vegetation Clearing Plan, c) clearing activities, d) rehabilitation activities, including success of plantings, and e) sightings of weeds, disease and/or unapproved vegetation mortality, within the reporting period. • Project Engineer to conduct at least one audit of the Project area during the construction phase to test compliance with the CEMP. • Post-works reporting to be conducted by Project Manager in regard to viability of planted areas, in accordance with Rehabilitation Plan.

Corrective Action	Responsibility	Timing
• Identify source of weeds, disease and/or mortality. • Take actions as necessary to remove weeds, disease and/or mortality, including as advised by State Government agencies. • Report any unapproved clearing to TMR.	MGN Civil Project Manager	Immediately after impact is identified
• Notify DES and DAF of any unapproved clearing. • Review and approve any amendment to the Rehabilitation Plan. • Conduct audit of the Project area to ensure compliance with new plans/management.	Principal	Immediately after impact is identified

6.6 Terrestrial Flora and Fauna

No terrestrial threatened species are expected to occur within the construction footprint. However, due to the location of the project site, there is the potential for threatened fauna species or habitat values for threatened fauna species to occur within this area at the time of works. In addition, construction activities can have impacts to threatened fauna species in relation to introduction of construction noise.

Management measures related to these impacts are described in Table 6-5. Measures related to construction phase traffic (e.g. risks of striking fauna crossing Clump Point Road and local access roads) are considered in Section 6.7 while measures related to clearing and weed management are considered in Section 6.5.

The management objective for the terrestrial threatened species element is:

No impacts to threatened flora or to fauna as a result of construction activities

This management objective is governed by the NC Act, and reflects requirements of the EPBC Act.

Table 6-5 Management measures for terrestrial flora and fauna

Objective	No impacts to threatened flora or to fauna as a result of construction activities		
Performance Criteria	• No incidence of threatened flora clearing or loss as a result of construction • No injury/mortality of fauna during construction		
Management Documents		**Responsibility**	
Pre-Clearing/Construction Survey methodology contained within the Vegetation Clearing Plan Appendix H. • If Pre-Clearing/Construction Survey identifies threatened flora species within the construction area, a Translocation Permit must be obtained. • If Pre-Clearing/Construction Survey identifies threatened fauna species or habitat within the construction area, a Species Management Plan must be prepared.		MGN Civil Project Manager, using a qualified ecologist	
Cassowary Avoidance Strategy (CAS) contained within Traffic Management Plan Appendix G.		MGN Civil Project Manager	
Management		**Responsibility**	**Timing**
If required, any threatened flora species within the clearing area identified during the Pre-Clearing Survey must be translocated in accordance with the Translocation Permit and Species Management Plan by a suitably qualified person.		MGN Civil Project Manager	Prior to works
If native fauna enters the work site, construction works must cease if impact is a risk. Construction activities will continue once the animals has moved from the work site or caught and relocated by a qualified and licenced spotter/catcher.		MGN Civil Construction Manager	At all times
All vehicle movements will operate in accordance with the Cassowary Avoidance Strategy.		All MGN Staff	At all times
Domestic animals are prohibited in the construction area.		MGN Civil Construction Manager	At all times
Monitoring	• Daily inspections of works areas to identify any mortality of fauna or threatened flora. • If required MGN Civil Project Manager to undertake monitoring in accordance with Translocation Permit and/or Species Management Plan.		
Auditing and Reporting	• Any sightings of threatened flora or fauna in the works area or adjacent environments during construction must be reported. Reports will be stored in a central database developed and maintained by the MGN Civil, and any incident of harm reported to the DES Hotline (1300 130 372). • All sightings/interactions with Cassowaries in the project area or along the haul route will be reported as per the CAS • EPR to be prepared by MGN Civil Superintendent at end of every fortnight, including details on a) compliance with the Quality Plan, b) compliance with any Species Management Program or Translocation Permit, b) sightings of threatened fauna, including description of behaviour, and c) identification of threatened flora or fauna habitat within works area, and actions taken (e.g. stop works), within the reporting period.		

	• Principal and/or Project Engineer (or delegates) to conduct at least one audit of the Project area during the construction phase to test compliance with the CEMP.

Corrective Action	Responsibility	Timing
• Notify TMR • Bring any injured animal to local vet • Identify cause of the mortality/clearing and updated relevant management plans	MGN Civil Superintendent	Immediately after impact is identified
• Notify DES • Review and approve any amended management plan element • Conduct audit of the Project area to ensure compliance with new plans/management actions	TMR	Immediately upon notification

6.7 Traffic

Quarry material for use in construction works will be brought to the site by trucks. Construction equipment will also transit to the site via existing roads. As a result, the construction phase will cause an increase in traffic volume for connecting road networks. It is expected due to the closed Clump Point Road; traffic volumes will decrease on Clump Point Road during the construction phase.

Increase in traffic poses risks to pedestrians, other vehicles and fauna that may be crossing the road. This includes the southern cassowary (*Casuarius casuarius johnsonii*) as individuals are known to cross between habitat either side of Clump Point Road and local road networks.

Other traffic impacts relate to the closure of parts of Clump Point boat ramp to local users (e.g. recreational boaters, commercial vessels) during the construction works. In addition, traffic generated by the Project on the local road network has the potential to impact on local residents and businesses.

In order to manage these impacts, a separate Traffic Management Plan (TMP) Appendix G has be prepared for the construction phase. This plan has the following elements:

- Management of boat ramp access for recreational vessels and communication process.
- Site set up and works area.
- Access management for Clump Point Road, including maintenance of access to Ecovillage at all times.
- Methodology for how rainforest canopy vegetation will be protected for the duration of the works.
- Trucking routes between quarry and construction site and transport strategy to minimise impacts on local residents and businesses.
- Cassowary Avoidance Strategy (CAS).

In addition, a Notice to Mariners will be prepared by the MGN Civil for works undertaken within the water in order to ensure management of navigational impacts. This will be approved by the Regional Harbour Master.

6.8 Cultural Heritage

A Cultural Heritage Management Plan (Appendix I) has been executed by the State with the Djiru people. This will provide the main governance mechanism for managing cultural heritage during construction works. Compliance with the CHMP will meet the Aboriginal Cultural Heritage Duty of Care under the *ACH Act*.

MGN Civil is required to manage all construction works subject to the CHMP. Additionally, MGN Civil will be required to develop a Chance Find Procedure to account for any situations where construction activities uncover unknown cultural heritage. This procedure must be compliant with the CHMP and the duty of care guidelines.

Table 6-6 Management measures for Cultural Heritage

Objective	All works conducted in accordance with CHMP	
Performance Criteria	• No accidental destruction of heritage items • Compliance with the CHMP	
Management Documents	**Responsibility**	
Cultural Heritage Management Plan Attachment I	MGN Civil Project Manager	
Management	**Responsibility**	**Timing**
Provide 14 days' notice to the Djiru Warrangburra Aboriginal Corporation, providing particulars of the High Impact Activities proposed to be carried out; • setting out the commencement date of High Impact Activities; • setting out the contact details of the Project Manager; • the number of Monitors required, being two; and • confirming the date(s) and time(s) that the Monitor(s) are required to attend at the Project Area to undertake Monitoring.	MGN Civil Project Manager	Prior to High Impact Activities
Nominate four Monitor(s) who can carry out the Monitoring work on the Project, although only two monitors will be required at one time.	Djiru Warrangburra Aboriginal Corporation	7 Days Prior to Works beginning
If a Heritage item is located by the Contractor when High Impact Activities are being undertaken without Monitoring due to the circumstances set out in CHMP or at any other time during the Project; • the High Impact Activities must cease in the Find Preservation Zone and the MGN Project Manager will contact the Djiru so that the procedure for Finds as set out in clause 9 of CHMP may be implemented.	MGN Civil Project Manager	At all times
If any human remains are uncovered during the Project, or if a Find is suspected to contain any human remains the procedure in the CHMP must be followed.	MGN Civil Construction Manager	At all times

Monitoring	• Monitoring using 2 x Djiru nominated persons for all high impact activities.
Auditing and Reporting	• EPR to be prepared by MGN Civil Project Manager at end of every month, including details on compliance with the CHMP, within the reporting period.

6.9 Dust and Noise

Construction phase activities have the potential to generate dust, particular in relation to transport of quarry material to site (if dirty), and from clearing and excavation. In addition, construction works will cause noise. These impacts have the potential to cause impacts to local amenity, including to residential/accommodation areas at Alexander Drive and Porter Promenade (within 0.5-1.0 km of construction area) and to recreational users of Clump Point.

In accordance with the EPP (Noise) and EPP (Air) the EVs considered most relevant are health and wellbeing (including in relation to the ability to sleep), community amenity, biodiversity of ecosystems, and the aesthetic environment. Objectives to be achieved at different sensitive receptor locations are set out in the schedules to the EPPs.

Management measures related to these impacts are described in Table 6-6. Dust and noise from traffic will be managed through the TMP under Section 6.7.

The management objective for the dust and noise element is:

No impact to EVs for air and noise within the Project Area and surrounds

This management objective is governed by the EP Act.

Table 6-7 Management measures for dust and noise

Objective	No impact to EVs for air and noise within the Project Area and surrounds		
Performance Criteria	• Quality objectives for air and noise at sensitive receptor sites are met throughout the construction phase • No dust is released beyond the boundaries of the works area		
Management Documents		**Responsibility**	
n/a			
Management Action		**Responsibility**	**Timing**
All stockpiles material that may cause dust must be covered and/or sprayed.		MGN Civil Construction Manager	At all times
Significant dust-generating events must not be undertaken during periods of strong easterly winds. This may include; • Vegetation Clearing activities, and • Carpark and surface works.		MGN Civil Construction Manager	At all times
All rock entering site via MGN trucks will be clean and free of fines.		MGN Civil Construction Manager	MGN Civil Construction Manager
A fresh water truck will be on standby to wet any surfaces that may cause dust generation at the project site.		MGN Civil Construction Manager	At all times
If deemed necessary, noise cancelling devices will be investigated and possibly installed and/or utilised during construction activities that cause significant noise.		MGN Civil Construction Manager	At all times
All construction equipment must be kept in good working condition and not cause excessive noise or emissions,		MGN Civil Construction Manager	At all times
The use of compressive breaking by MGN Civil trucks hauling rock must not occur in built up areas.		MGN Civil Construction Manager	At all times
All truck movements from the quarry to the project site will not enter the Mission Beach township prior to 7am to reduce noise at inappropriate times. All truck movements associated with rock cartage will cease at 6pm each operating day.		MGN Civil Construction Manager	At all times during haulage
There will be no works undertaken at the project site on Sunday's, public holidays, and during the Cassowary Festival weekend.		MGN Civil Construction Manager	At all times
Monitoring	• Ongoing monitoring by the MGN Civil Construction Manager during construction works to ensure no excessive noise and/or dust is being generated • If a complaint is received and if deemed necessary by TMR, the MGN Civil Project Manager to prepare and implement a Noise and Dust Monitoring Program designed in accordance with EHP guidelines		

Auditing and Reporting	• EPR to be prepared by MGN Civil Superintendent at end of every month, including details on a) compliance with the Quality Plan, b) compliance with the TMP as it relates to noise and dust, b) any air and noise complaints received, and c) investigations and/or monitoring undertaken, within the reporting period. • Project Engineer to conduct at least one audit of the Project area during the construction phase to test compliance with the CEMP.

Corrective Action	Responsibility	Timing
• Identify cause of the excessive noise and/or dust emissions and modify practices as necessary to avoid impacts	MGN Civil Project Manager	Immediately after impact is identified

6.10 Spills and Waste Management

Construction activities have the potential to release hydrocarbons and other contaminants to the environment as a result of spills from equipment and vehicles, and to generate waste. The potential contaminants/waste products that could be generated during the construction phase include the following:

- Fuels and oils (from equipment and vehicles);
- Vegetation litter;
- Excess rock, soil and/or other construction materials;
- Material removed from the existing breakwater return; and
- General litter.

Management measures to reduce the impacts associated with this litter are described in Table 5-7. Additional measures focused on avoiding stormwater mobilisation of materials into the marine environment are described in Section 5.2.

The management objective for the spill and waste management element is:

> ***No net contribution of waste or contaminants to the environment within the Project Area as a result of construction works***

This management objective is governed by the EP Act and is in accordance with the Marine Parks Act and GBRMP Act.

Table 6-8 Management measures for spills and waste management

Objective	No net contribution of waste or contaminants to the environment within the Project Area as a result of construction works		
Performance Criteria	• No waste is left at the construction site after works • No waste or spills are discharged into the marine environment • No spills made on land or water and left untreated • All waste lawfully disposed		
Management Document		**Responsibility**	
Spills and Waste Management Plan Appendix J		*Prepared by*: MGN Civil	
		Approval: TMR	
Inventory of potential pollutants contained within the Spill and Waste Management Plan			
Management Action		**Responsibility**	**Timing**
Spills Management key actions: • Appropriate spill kits are available. Marine and land base. • All persons trained in how to use spill kits. • Use spill kit material, lawfully disposed and kit replenished. • All hydrocarbons/chemicals stored correctly in bunded areas. • Refueling to occur at least 25m from water. • Daily inspection of plants hoses to check for wear.		MGN Civil Construction and Project Manager	Prior to and during works
Waste Management key actions: • General, Recycling and Construction bins available on site and emptied at Tully Waste Facility as required. • Sewerage waste pumped out by licenced operator as required. • Excavated intertidal waste material treated and tested (if required) and deposited at Tully Waste Facility. • Any discharged waste/rubbish into water must be recovered immediately. • At completion of works, all waste and excess construction material must be removed from the site.		MGN Civil Construction Manager	During Work
Monitoring	• Monitoring by MGN Civil Construction Manager as per the Spills and Management Plan. • Daily monitoring of the site and stockpiles by MGN Civil Construction Manager. • Inspections of the site by MGN Civil Project Manager following completion of construction works.		
Auditing and Reporting	• EPR to be prepared by MGN Civil Superintendent at end of every month, including details on a) compliance with Quality Plan, b) compliance with Spill Management Plan and Waste Management		

	• Strategy, c) any chemicals or hazardous materials used, d) changes to the site inventory (if any) and associated storage and management arrangements, d) waste volumes generated, e) any waste movements (i.e. collection of waste) and f) any spills and actions undertaken, within the reporting period. • Reporting of any spills to Construction Manager and TMR. • If spill occurs on water or spill enters water in the GBRMP, notification to GBRMPA must also be made. • For major pollution events Project Manager to phone the 24/7 Pollution Hotline - 1300 130 372 • Principal and/or Project Engineer (or delegates) to conduct at least one audit of the Project area during the construction phase to test compliance with the CEMP.

Corrective Action	Responsibility	Timing
• Immediately clean up the waste and/or spill • Identify cause of the waste loss/spill and update procedures as necessary to avoid a repeat.	MGN Civil Construction Manager	Immediately after impact is identified

7. References

Aurecon (2014), *Marine Ecology, Water Quality & Sediment Sampling Report*, Appendix J to *Mission Beach Safe Boating Infrastructure Project: Planning Report*, prepared for DSD and TMR

Aurecon (2016, *Mission Beach Safe Boating Infrastructure Project: Construction Environmental Management Plan – Tender Package 2 Works*

BMT WBM (2015), *Greater Mission Beach Foreshore Management Plan*, prepared for CCRC

BMT WBM (2016a), *Clump Point Boat Ramp: Marine Ecology, Water Quality & Sediment Sampling Report*, prepared for DSD and TMR

BMT WBM (2016b), *Clump Point Development Plan – Terrestrial Ecology Assessment*, prepared for DSD and TMR

Girrigun Aboriginal Corporation (2007), *Indigenous Cultural Significance Assessment, Mission Beach, Girrigun Aboriginal Corporation Study 2007*, prepared by Djiru Traditional Owners, compiled by P, Pentecost

8. Attachments

Environmental Checklist

Daily Site Inspection

Name of Inspector:

Vehicles/vessels/equipment visually inspected by operators prior to start-up?	Yes ☐	No ☐
Have routine maintenance issues been identified during pre-start inspection?	Yes ☐	No ☐
Have incidents related to operation occurred? (For example, broken oil-line)?	Yes ☐	No ☐
Have any fauna injuries/deaths occurred as a result of works activities?	Yes ☐	No ☐
Vehicles/vessels/equipment excessively noisy or emitting excessive exhaust?	Yes ☐	No ☐
Erosion & sediment controls in place and in good repair?	Yes ☐	No ☐
Visible air-borne dust as a result of works activities?	Yes ☐	No ☐
Turbidity increased within or immediately surrounding work site?	Yes ☐	No ☐
Turbidity plume extending more than 50m from work site	Yes ☐	No ☐
Visible films/oils/grease on water surface or floating litter?	Yes ☐	No ☐
Material stockpiles and waste storage clear of watercourses & drainage paths?	Yes ☐	No ☐
Materials stockpiled appropriately? (Neatly and within site compound)?	Yes ☐	No ☐
Rubbish/wastes/litter stored within site compound, covered where possible?	Yes ☐	No ☐
Rubbish/wastes/litter generated by works activities located outside work site?	Yes ☐	No ☐
Suitable (appropriate size, with lids) waste receptacles readily available?	Yes ☐	No ☐

Waste receptacles being used?	Yes ☐	No ☐
Spill kit readily available?	Yes ☐	No ☐

Comments

_____

_____

Inspector's Signature _____

Date _____

Minor Environmental Incident Log

Template : Minor Environmental Incident Log	Revision Number: 1
	Effective Date:

Purpose: The Minor Environmental Incident Log forms part of the Environmental Management Plan. It is used to record those incidents that are minor and contained within the project/workshop/site boundaries. Although the Minor Environmental Incident Log can be used by all personnel, the Project Manager, and/or Facility Manager is accountable for ensuring the log is being used appropriately.

Project/Facility Name:		**Project/Facility Manager**:	

Date of Incident	Brief Description of Incident	Close Out of Actions	Date and Initial by EO &/or PM

TMR Environmental Incident Report Form

Environment and Heritage Incident Report Form	**Form Number: 1 /2011 effective from 1 December 2012** **Purpose: Use when no access to TMR WIN system**

SECTION 1 – Incident Details	
Submitter's Name:	
Submitter's Position:	
Submitter's Phone Number:	
Incident Location (road name, number and chainage or GPS or property description or address)	
Date/Time Occurred:	
Date/Time Identified:	
Project/Site Name and Number	
Project/Site Managers Name	
Contractor (if relevant)	
Contract/Approval Type	
Does this incident need to be reported to regulatory authorities? ☐ YES ☐ NO ☐ UNSURE	
Has an infringement notice or warning been received from a regulatory agency (e.g. DES or DAFF)? ☐ YES from [insert administering authority] Reference No. [insert reference number] ☐ NO	
SECTION 2 – Incident Description (Attach photos or reports or evidence where possible)	
What occurred? (e.g. 300m^2 was cleared by the contractor which was outside of the limits specified in the contract)	

What was impacted or potentially could have been impacted? (e.g. the vegetation wrongly cleared was regional ecosystem 11.4.5 and was considered to be in good condition with minimal disturbance. The vegetation was listed under the EPBC Act.) **What are potential on-going impacts from the incident?** (e.g. the soils are dispersive and have high erosion potential and this was the habitat for the endangered Bull Tree Butterfly). **What was the scale of the incident?** (e.g. 300m^2 cleared over 500m of road reserve. This represents 30% of the RE in the immediate area >10km radius). **Temporary controls implemented?** **Other Comments?**	

SECTION 4 – Immediate Corrective Action and Remediation		
Recommended Controls or Treatments	**Responsible Officer**	**Action Date**
The actions should reduce or eliminate the direct and indirect impacts of the incident.		

SECTION 5 – Approved Course of Action		
APPROVED for implementation APPROVED WITH FOLLOWING CHANGES to recommendations NOT APPROVED for following reasons		
Name and Position:	**Signature**:	**Date**:

Appendix D – Guideline: Environmental Incident Levels, Reporting and Timeframes

Purpose

The purpose of this document is to outline the reporting requirements for actual and/or potential environmental incidents.

Environmental Harm Incidents – These are incidents that have or have the immediate potential to cause environmental harm. These incidents may be in breach of legislation and may attract penalties

Environmental Administrative Incidents – These are breaches of legislation, our policies, systems, plans and processes that have not actually caused harm. These incidents may be in breach of legislation and could still attract penalties.

Who Determines the Incident Level - To ensure consistency of reporting the level of harm is determined centrally by the Director, Environmental Sustainability and within RoadTek, the Manager, Environment and Sustainability except for level 3 and 4 Environmental Harm incidents these will be determined by agreement between the EO and PM and the agreed level noted in the WIN for entry into the system.

Why Report – There are three very important reasons to report all actual and potential environmental incidents, these are:

1 There is a legislative requirement to report environmental harm to the Environmental Protection Agency and if harm is reported you will not be prosecuted for any further harm that occurs. (so long as you take all practical measures to prevent further harm)

2 It allows us to learn by our mistakes. By investigating why an incident occurred actions can be put in place to prevent it happening again, (continuous improvement) that is why we use the WIN system to report Environmental Incidents.

3 Government and TMR governance requirements are that we report non-compliance; there is also ever increasing community expectation that environmental performance is openly reported.

Minor Incident Log – This is a register that is generally a part of the Environmental Management Plan that is used to record those incidents that are minor and contained within the project/workshop/site boundaries. The main purpose is to identify improvement opportunities e.g. Manager reviews log and identifies multiple minor fuel spills and implements fuel handling training in response.

(PM – Project Manager, EO- Environmental Officer, RD- Regional or Executive Director, GM- General Manager DES – Dept of Environment & Sciences)

Environmental Harm Incidents			
Level	**Reporting**	**Description**	**Example**
Nil	Record in Minor Incident Log	**Minor Incident** • *Must be within project/worksite/depot boundaries, minor and easily cleaned up or rehabilitated*	• Burst hydraulic hose within project boundaries that is immediately cleaned up • Small oil spill while undertaking plant maintenance that is immediately cleaned up • Paint spill that is contained and cleaned up
1	Report to PM and via WIN within 48 hrs.	**Level 1 Environmental Incident** • *Short term impact (actual or potential) on an environmental value*	• Complaint regarding noise, dust etc.; • Small amounts of sediment escaping from a project site that can be cleaned up; • Small spill e.g. 20 litres outside of project boundaries that is immediately cleaned up; • Insufficient erosion and sediment controls; • Incorrect storage of large amounts (1,000 L) of chemicals, bitumen fuels and oils; • Transportation of plant or equipment likely to contain weed seed.
2	Report to PM and EO within 4 hrs and via WIN within 24 hrs.	**Level 2 Environmental Incident** • *Recurring or more intense impact (actual or potential) of an environmental value.*	(Limited environmental effect) • Over clearing or death of native fauna; • Continued complaints regarding dust, noise etc; • Minor sedimentation/pollution of waterbody; • Unauthorised dumping of construction waste; • No wash down of plant/vehicle coming from an area with class 1 or 2 declared weeds; • Undertake works without appropriate cultural heritage assessment.
3	Report to PM and	**Level 3**	(Significant environmental medium-term

Environmental Harm Incidents			
Level	**Reporting**	**Description**	**Example**
	EO immediately and then PM reports to RD within 4 hrs and by WIN within 24 hrs. **(EO to report to DES under RD direction)**	**Environmental Incident** • *Not trivial or negligible in nature* • *Causes or potential loss or damage to property of an amount totalling$5,000 but less than $50,000; or* • *Results in costs of more than $5,000 but less than $50,000 to prevent and/or minimise the harm and rehabilitate or restore the environment to its condition before the harm*	effect) • High levels of sediment entering a waterbody; • Excessive over clearing or clearing of a sensitive area; • Chemical/fuel/oil/bitumen spill to water; • Incorrect disposal or regulated waste; • No erosion or sedimentation controls in a sensitive area (potential); • Interferes with or causes damage to a culturally sensitive site
4	Report to PM and EO immediately and then PM report to RD immediately, RD report to GM immediately and by WIN within 24 hrs. **(EO to report to DES under RD direction)**	**Level 4 Environmental Incident** • *Causes actual or potential harm to the environment that is irreversible, of a high impact or widespread; or* • *Causes actual or potential loss or damage to property of an amount or amounts totalling $50,000*	(Major issues with potentially serious environment consequences and long-term impacts) • Unauthorised clearing in protected or sensitive area; • Large scale unauthorised clearing; • Major spill contaminating land or water; • Exposure of acid sulfate soils resulting in fish kill

Environmental Harm Incidents			
Level	**Reporting**	**Description**	**Example**
		damage or rehabilitation costs.	

Environmental Administrative Incidents			
Level	**Reporting**	**Description**	**Example**
1	Report to PM and via WIN (inc equivalent positions)	**Minor Administrative Breach** *No legislative breach*	• EMP not current; • Insufficient environmental training; • Scheduled inspections not undertaken
2	Report to PM and via WIN	**Administrative Breach** *Possible legislative breach*	• Failure to obtain permit/licence; • Breach of licence/permit/guideline not causing nuisance or harm; • No EMP; • Incorrect storage of chemicals, bitumen, fuels and oils; • Erosion and Sediment controls not maintained.
3	Report to PM and RD and via WIN	**Multiple Administrative Breaches**	• Several of the above on the one site
4	Report to PM and RD and via WIN	**Repetitive Administrative Breaches**	• Recurring issue above at the one site or under control of the same manager

Form A – Contractor's Monthly Environmental Reporting

Reporting of Contractor's environmental and cultural heritage management by exception.

Reporting Requirement (clause reference)		Month (total)	Notes from Contractor	
General				
Any revisions to EMP(C) this month? (Clause 6.1)			*Submitted to Administrator for suitability?*	
Have there been updates to ESCP this month? (MRT52)			*Submitted to Administrator for suitability?*	
Any Independent audit of ESC completed this month? (MRTS52, Clause 9.2.1)			*Any non-conformances identified?*	
Non-Conformances, Incidents, Complaints				
Environment and Cultural Heritage-related complaints received? (Clause 7.3) Status of complaints		Month, (Total)	*Attach insert of Complaint register (GCC Clause 15.6.2)*	
Number of environment and cultural heritage-related non-conformances raised? (Clause 7.6) Status of non-conformances?		Month, (Total)	*Attach insert of non-conformance register*	
Number of Environmental and Cultural Heritage Incidents that have occurred or been identified this month?		Month, (Total)	*Provide summary of incidents identified this month:*	
Incident No.	Incident Description	Reportable incident: Y/N	Reported to Admin Authority? Y/N	Incident report submitted to Administrator?
Weekly Site Inspections				
Weekly Site Inspections have been completed? (Clause 7.1)		Number	*List issues identified and corrective actions undertaken?*	
Monitoring				
Water quality monitoring for Discharge and Waterways undertaken: 1. Weekly where potential impact to water? 2. During/after rainfall event? (Clause 8.2.3)				
Number of Water Quality (Discharge) results outside criteria?		Month, (Total)	Where exceedance occurs, provide spreadsheet showing exceedances, rainfall event, cause, corrective action	
Number of Water Quality (Waterway) results outside criteria?		Month, (Total)	*Where exceedance occurs, provide spreadsheet showing exceedances, rainfall event, cause, corrective action*	

Where required, Cultural Heritage Monitoring (Indigenous or Non-Indigenous) has been undertaken?		*As specified in Annexure.*
Where required, construction noise monitoring undertaken?(Clause 8.5.3) Number of exceedances of criteria?	Month, (Total)	*Where exceedance occurs, provide spreadsheet showing exceedances, location, cause, corrective action*
Where required, construction vibration monitoring undertaken? (Clause 8.6.3) Number of exceedances of criteria?	Month, (Total)	*Where exceedance occurs, provide spreadsheet showing exceedances, location, cause, corrective action*
Air quality monitoring undertaken? (Clause 8.7.3) Number of exceedances of criteria?	Month, (Total)	*Where exceedance occurs, provide spreadsheet showing exceedances, location, cause, corrective action*
Number of animal breeding places identified and avoided during Work under the Contract (Clause 8.10.3)	Month, (Total)	
Number of animal breeding places tampered with under a SMP? (Clause 8.10.3)	Month, (Total)	*Where SMP held by Principal, provide register monthly.*
Number of animals / eggs destroyed under an Approval.	Month, (Total)	
Number of injuries or death to native fauna within the Site (Clause 8.10.3)	Month, (Total)	*Provide details*
Where required, Waste Register is being recorded (Clause 8.13.2)		
Where sourcing Non-Potable Water (Section 8.15.2): 1. Water extraction logs recorded? 2. For non-flowing sources, what % of full capacity is the source at the end of the month? 3. For flowing source, is the source maintaining flow?	% of full	
Transport and Main Roads Quarry Protocol and Environmental Authority - Quarry extraction volume/s (8.15.2)	Month, (Total)	*Provide volume per extraction Site.*
Compliance Testing (where applicable provide details)		
Comments to Administrator regarding Environment and Cultural Heritage:		
Positive Environmental and Cultural Heritage Outcomes		

[Positive environmental outcome is an improvement to the existing environmental values on site or a reduction in the environmental impact to that allowed in the EMP(C). Examples, water quality of Discharge better than 50 mg / or minimise vegetation clearing to less than the Contractual maximum Limits of Clearing]

Achieved:

Future Opportunities:

Report Completed by:	**Signature:**	**Date:**
Name:		

Form B – Contractor's Environment and Heritage Incident Form

Environment and Heritage Incident Report Form	Version Date: April 2017
SECTION 1 – Incident Details	
Project Name / Site Name:	
Location (road name, number and chainage or GPS or property description or address)	
Report completed by Name, Position	
Signature:	
Contact Phone Number	
Contracting Company	
Date / Time Occurred :	**Date / Time Identified :**
Has the Contractor already reported this incident to the Administrating Authority?	☐ **YES** ☐ **NO**
Has an infringement notice or warning been received from an Administrating authority?	☐ **YES** from Reference No. ☐ **NO**
Has a complaint been received regarding the Incident?	☐ **YES** ☐ **NO**
SECTION 2 – Incident Description (Attach photos or reports or evidence where possible)	
Where? *(Location within the project site)* **What occurred?** *(e.g. 300 m² was cleared by the contractor which was outside of the limits specified in the contract)* **What was impacted or potentially could have been impacted?** *(e.g. the area cleared had not been assessed for potential cultural heritage harm. The vegetation wrongly cleared was regional ecosystem 11.4.5 and was considered to be in good condition with minimal disturbance. The vegetation was listed under the EPBC Act.)* **What are potential on-going impacts from the incident?** *(e.g. the soils are dispersive and have high erosion potential and this was the habitat for the endangered BullTree Butterfly).* **What was the scale of the incident?** *(e.g. 300 m² cleared over 500 m of road reserve. This represents 30% of the RE in the immediate area > 10 km radius).* **Temporary controls implemented?** **Other Comments?**	
SECTION 3 – Immediate Corrective Action and Remediation	

Responsible Officer/s		**Date actions completed by**	
The actions should reduce or eliminate the direct and indirect impacts of the incident.	***Immediate actions and controls implemented.***		

SECTION 4 – Administrator Deemed Suitability for Course of Action

☐ **Deemed Suitable** for implementation

☐ **Deemed Suitable WITH FOLLOWING CHANGES** to recommendations Click here to enter text.

☐ **Not Deemed Suitable** for following reasons: Click here to enter text.

Name and Position:	**Signature:**	**Date:**

Form C – Contractor's Waste Register

(Required to be collated by Contractor and submitted to Administrator where triggered in Clause 11.2 of Annexure MRTS51.1 and emailed to ProjectWasteRegister@tmr.qld.gov.au. Definitions are provided in MRTS51.)

Project													
Waste	**Generated**			**Reused**			**Recycled**			**Disposed to landfill**			
	tonnes	kg	litres	tonnes	kg	litres	tonnes	kg	litres	tonnes	kg	litres	Cost ($)
Metal													
Paper / card board													
Green waste (vegetation)													
General refuse													
Excess earthworks (unsuitable or excess material including acid sulphate soil material)													
Profiled materials, asphalt, hot / cold mix, bitumen													
Concrete													
Regulated waste (including but not limited to paint, oil, paint sludge, paint water, resins / epoxies, thinners, abrasive blasting waste, emulsion, tyres)													
Regulated waste that is contaminated soil													
Regulated waste containers (paint / oil / pesticides etc.)													
Third party Illegally dumped refuse and litter removed from Site by Contractor													