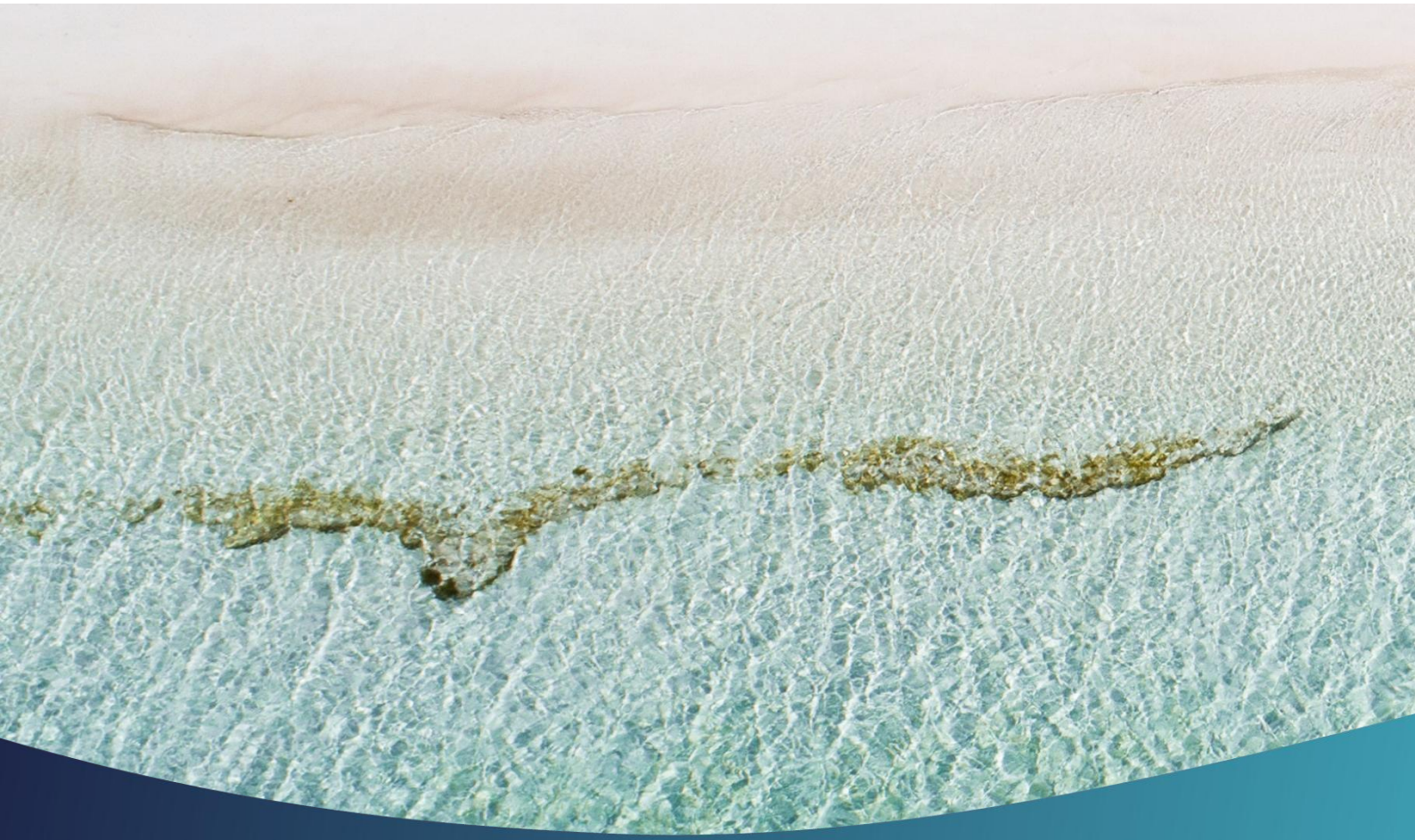
Operations Environmental Management Plan

South Thomson Barge Landing Development

ENVIRONMENT
An O2Marine company



CLIENT: Rottnest Island Authority

STATUS: Rev 1

REPORT NUMBER: R250026

ISSUE DATE: 12 March 2025

MARINE

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Acknowledgement Of Country

In the spirit of reconciliation O2 Marine Pty Ltd acknowledge that this project is proposed on the lands of the Whadjuk Noongar People. We pay our respects to Elders past, present and emerging and recognise their continuing connection to land, sea, culture and community.

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Version Register

Version	Status	Author	Reviewer	Comments	Authorised for Release (signed and dated)
Rev A	Draft	N Claydon B Campbell	G Motherwell	Draft review	G Motherwell 18/2/2025
Rev B	Draft	N Claydon B Campbell	A Vlok (Emerge)	Draft review	N Claydon 19/2/2025
Rev 0	Final	N Claydon	A Vlok (Emerge) G Motherwell	Issued for Use	N Claydon 11/3/2025
Rev 1	Final	N Claydon	G Motherwell	Issued for Use	N Claydon 12/3/2025

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Acronym Table

Acronyms/Abbreviation	Description
ACH	Aboriginal cultural heritage
ASS	Acid Sulfate Soil
BC Act	Biodiversity Conservation Act
BCH	Benthic Communities and Habitat
BoM	Bureau of Meteorology
BTEX	benzene, toluene, ethyl-benzene and xylene
CEMP	Construction Environmental Management Plan
CD	Chart Datum
CoC	Chain of Custody
DBCA	Department of Biodiversity Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DE	Development Envelope
DoT	Department of Transport
DPIRD	Department of Primary Industries and Regional Development
DPLH	Department of Planning and Land Heritage
DEMMP	Dredging Environment Management and Monitoring Plan
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EIL	Ecological Investigation levels
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPO	Environmental Protection Outcomes
EQG	Environmental Quality Guideline
ESL	Ecological Screening Levels
HIL-A	Health Investigation Levels for residential soil access
IMS	Introduced marine species
Km	Kilometre
LAU	Local assessment unit
LEP	Level of Ecological Protection
LoR	Limit of Reporting
m	Metre
MEER	Maritime Environmental Emergency Response
MEQ	Marine Environmental Quality
MEQMP	Marine Environmental Quality Monitoring Program
MNES	Matters of national environmental significance

Acronyms/Abbreviation	Description
MT	Management Targets
MWQMP	Marine water quality monitoring program
NAGD	National Assessment Guidelines for Dredging
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measures
NTC	Native Title Claim
NTU	Nephelometric Turbidity Units
OEMP	Operations Environmental Management Plan
The Proposal	The South Thomson Barge Landing development
PAH	polycyclic aromatic hydrocarbons
PFAS	per- and poly-fluoroalkyl substances
POLREP	Pollution Report Form
QA/QC	Quality Assurance/Quality Control
RIA	Rottnest Island Authority
SPL	Species Protection Levels
SSC	Suspended Sediment Concentration
TEC	Threatened Ecological Community
TMF	Tiered Management Framework
TOC	Total organic carbon
TRH	total recoverable hydrocarbons
TSS	Total Suspended Solids
VU	Vulnerable
WA	Western Australia
ZoHI	Zone of High Impact
ZoI	Zone of Influence
ZoMI	Zone of Moderate Impact

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1. Introduction

The Rottnest Island Authority (RIA) (the Proponent) is intending to redevelop an area of South Thomson Bay to provide a barge landing for commercial marine and barge services. The South Thomson Barge Landing development (the Proposal) will consist of the construction of a laydown area and breakwater/groyne extension which involves dredging, construction of the laydown using the dredged material and piling for the jetty. A summary of the proposal is given in Table 1.

Table 1: Summary of the proposal

Proposal title	South Thompson Barge Landing Development
Proponent name	Rottnest Island Authority
Short description	The Rottnest Island Authority is proposing to develop the South Thomson Barge Landing Development at the existing Army Groyne in South Thompson Bay. The proposal will be primarily used for barge operations, which will be relocated from the existing ferry terminal at central Thompson Bay to the proposed location at South Thompson Bay. This will separate barge operations from public passenger transfer activities and ease congestion at the ferry terminal.

Wadjemup (Rottnest Island) is located approximately 20 km west of the port of Fremantle in Western Australia (WA). It is an A-class reserve of ecological, cultural and social significance. It is a world-renowned tourist attraction with over 780,000 visitors annually. Most visitors travel by ferry, though many can travel by private vessel or even by small plane. There are limited short stay accommodation, and a very small resident population. The proposal will be located at the existing Army Groyne less than 1 kilometre (km) south of the existing ferry terminal, where the cargo barges are berthed currently. The Rottnest Island Master Plan highlighted the need to improve functionality and efficiency of transporting bulk cargo to and from Wadjemup, reduce noise levels for residents and to improve safety and amenities for visitors. It is proposed that redeveloping the Army Grone will achieve this, by converting it into a barge landing, freight handling and associated storage area.

1.1. Proposal description

As described above, the Proposal will consist of the construction of the laydown area and wharf structure, which will require dredging, piling for construction of the jetty and construction of the laydown area. Once construction is completed, operations of the Proposal will involve the following:

- All commercial supplies will be brought onto Rottnest Island via this new landing facility, typically via motorised barges. A minimum of two barges per day are expected to use the facility, increasing to support island logistics as required
- Road access via Army Jetty Road will be the only access, and vehicles will be predominantly light vehicles
- The facility will be mainly utilised during the day, with night deliveries only under exceptional circumstances
- The operating life of the facility is expected to be a minimum of 50 years.

The Proposal location with construction footprint and development envelope is shown in Figure 1.

Figure 1: Proposal development envelope overview

1.2. Purpose of this plan

The purpose of this operations environmental management plan (OEMP) is to manage environmental risks associated with operations and to assign appropriate management targets, monitoring and management actions.

This OEMP has been prepared for inclusion in the environmental referral documents to the Western Australian Environmental Protection Authority (EPA) for the approval of the Proposal. This OEMP outlines the framework for the construction activities including:

- Legislation and regulations that apply to the operational program
- Overall management framework
- Environmental values to be protected, the risks that operations may pose, and the mechanisms to be implemented to mediate these risks (management strategies)
- Responsible parties
- Monitoring and reporting
- Consultation.

This OEMP is a live document and may be updated to reflect the needs of the Proposal. The revision process is also included in this document.

This OEMP is also to be read in conjunction with plans and procedures for operations on Rottnest Island (for example the RIA Spill Prevention and Response Plan (RIA 2025)) and the other management plans for the Proposal, namely:

- Dredging Environmental Monitoring and Management Plan – addressing the management of dredging activities of the Proposal
- Construction Environmental Management Plan – addressing the management of construction activities of the Proposal.

1.3. Objectives

The specific objectives of this OEMP are aligned with the relevant environmental objectives presented within the EPA's statement of principles, environmental, factors, objectives and aims of EIA, which are summarised below and explained in greater detail in Section 4 (EPA 2021):

- Benthic communities and habitats: to protect benthic communities and habitat (BCH) so that biological diversity and ecological integrity are maintained.
- Marine environmental quality: to maintain the quality of water, sediment and biota so that environmental values are protected.
- Marine fauna: to protect marine fauna so that biological diversity and ecological integrity are maintained.
- Coastal processes: to maintain the geophysical processes that shape coastal morphology so that the environmental values of the coast are protected.
- Flora and vegetation: to protect flora and vegetation so that biological diversity and ecological integrity are maintained.
- Terrestrial fauna: to protect terrestrial fauna so that biological diversity and ecological integrity are maintained.

- Social surroundings: to protect social surroundings from significant harm.

1.4. Legislation, regulations and guidelines

The potential environmental impacts of the Proposal will be assessed at Commonwealth, State and Local Authority level with each Authority providing guidance on the level of assessment required. This OEMP was developed with consideration of those approvals and with the following legislation and guidelines.

1.4.1. State

- *Environmental Protection Act 1986* (EP Act)
- *Biodiversity Conservation Act 2016* (BC Act)
- *Port Authorities Act 1999*
- Navigable Waters Regulations 1958
- Shipping and Pilotage (Port and Harbour) Regulations 1967
- *Western Australian Marine Act 1982*
- *Pollution of Waters by Oil and Noxious Substances Act 1987*
- *Marine and Harbours Act 1981*
- *Environmental Protection Act 1986*
- Environmental Protection Regulations 1987
- *Fisheries Resource Management Act 1994* (relevant to Introduced Marine Pests)
- Western Australia Environmental Protection Authority - Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans (EPA 2021)
- Western Australia Environmental Protection Authority Technical Guidance - Protecting the Quality of Western Australia's Marine Environment (EPA 2016a)
- Western Australia Environmental Protection Authority Technical Guidance – Protection of Benthic Communities and Habitats (EPA 2016b).

1.4.2. Commonwealth

- *Environment Protection and Biodiversity Conservation Act (1999)* (EPBC Act)
- *Environment Protection (Sea Dumping) Act 1981*
- *Protection of the Seas (Prevention of Pollution from Ships) Act 1983*
- *Biosecurity Act 2015*
- Biosecurity Regulations (2016)
- Australian Ballast Water Management Requirements Version 7 2017
- National Water Quality Management Strategy (Commonwealth of Australia 1992).

1.5. Approvals background

Environment Protection and Biodiversity Conservation Act 1999

RIA referred the Proposal to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) in late 2024 within consideration to the relevant matters of national environmental significance (MNES) for this Proposal including:

- Listed threatened species and communities (sections 18 and 218A)
- Listed migratory species (sections 20 and 20A)
- The world heritage values of a declared world heritage property (sections 12 and 15A)
- The heritage values of a national heritage place (sections 15B and 15C)
- Commonwealth land (section 26 and 27A).

On 16 January 2025 the DCCEEW decided the Referral was "not a controlled action" and therefore did not require further approval under the EPBC Act. The Proposal is currently being assessed by the EPA as described below.

Environmental Protection Act, 1986 Part IV

The Proposal was referred to the EPA for assessment on 23 August 2024 and decision on whether to assess the Proposal was provided on 13 September 2024 by the EPA. It was determined that the Proposal would be assessed at the level of 'Referral Information with additional information' (required under s.40(2)(a) of the EP Act) with public review.

The environmental factors include:

- Benthic communities and habitat
- Coastal processes
- Marine environmental quality
- Marine fauna
- Flora and vegetation
- Terrestrial fauna
- Social surroundings
- Other factors.

In 2023 the RIA met with the WA EPA to discuss referral of the proposal. Following this meeting the RIA recommenced the Proposal, and as such the following studies have been recently completed to progress environmental approvals:

- Terrestrial flora and fauna survey of the onshore area.
- Benthic habitat assessment of the marine development area and surrounds.
- Marine fauna desktop assessment of the marine development area and surrounds.
- MNES assessment.
- Dredge plume modelling.
- Coastal processes assessment.
- Baseline water quality monitoring.

Environmental Protection Act, 1986 Part V

A works approval and operating licence for the proposal may be required under the EP Act Part V. The following items will be assessed, and management provisions assigned:

- Noise emissions
- Air emissions
- Wastewater disposal
- Solid waste disposal.

1.6. Port governance

RIA is the responsible authority over the marine jetties around the Island.

1.7. Reserve governance

The Rottnest Island Reserve was established under the *Rottnest Island Authority Act 1987*, and management of the reserve is the responsibility of the Rottnest Island Authority in accordance with the Act.

2. Existing Environment

2.1. General environment

The existing jetty at the Proposal area at Wadjemup or Rottnest Island (the Island) was built from rock fill and compacted limestone base in 1972, which replaced an older jetty at the same location (RPS 2020). It is approximately 120 m long and approximately 1,700 m^2 and in 2018 the platform was removed and converted into a rock groyne due to its fragility and partial collapse (RPS 2020). It is within a relatively healthy environment, with little turbidity and abundant seagrasses and macroalgae.

The Rottnest Island Marine Reserve encapsulates all waters around the Island and is characterised by a unique blend of tropical and temperate species (RPS 2024a), and supports some of the most diverse marine gardens, ~20 species of coral and ~400 species (RIA n.d.). To protect this biodiversity there are five marine sanctuary zones in waters around Rottnest Island. The Proposal sits within the Rottnest Island Marine Reserve, however, it is not within or adjacent to any of the Island's five Sanctuary Zones.

2.2. Climate and oceanography

The Island is located within in the temperate region of the Indian Ocean approximately 18 km west of Perth in WA.

Sea water temperature generally ranges between 16.4℃ in September and 26.5℃ in March (Sea Temperature 2024). Air temperature ranges between a mean minimum of 12.4℃ in August and mean maximum of 27.2℃ in February (BoM 2024), coinciding with the six seasons. Mean annual rainfall is 558.4 mm, with a maximum average monthly rainfall of 111.5 mm in July. Annually, the 9am wind direction varies from northeasterly and easterly to southern winds, as shown in Figure 2. By 3pm there is less variation annually, with winds generally south to south-west, as shown in Figure 3.

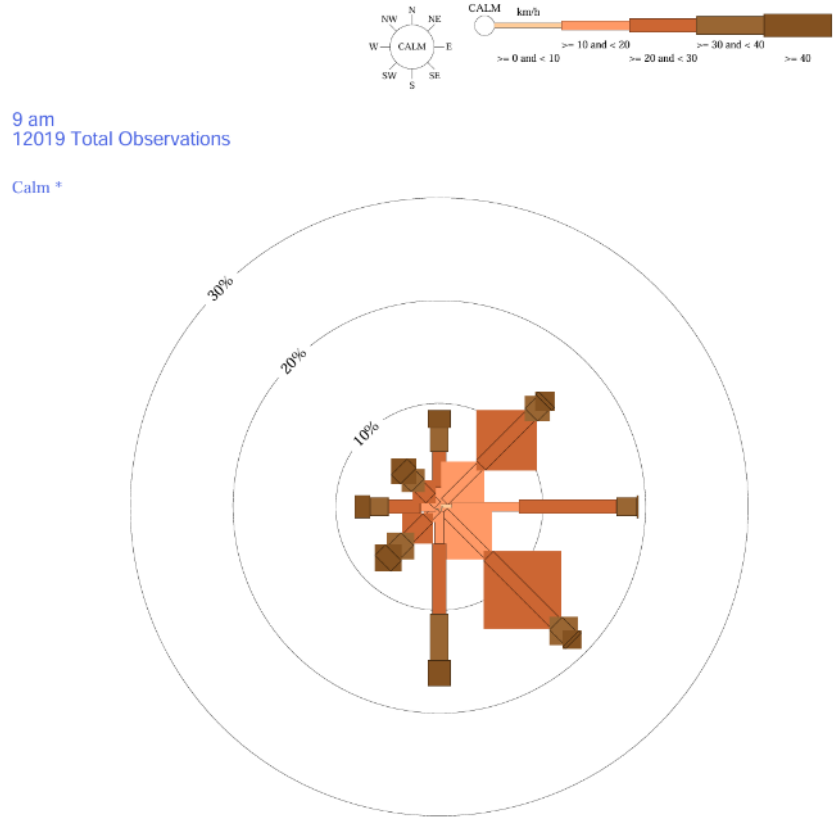

Figure 2: Wind direction and speeds measured at 9am over 12019 daily observations (BoM 2024)

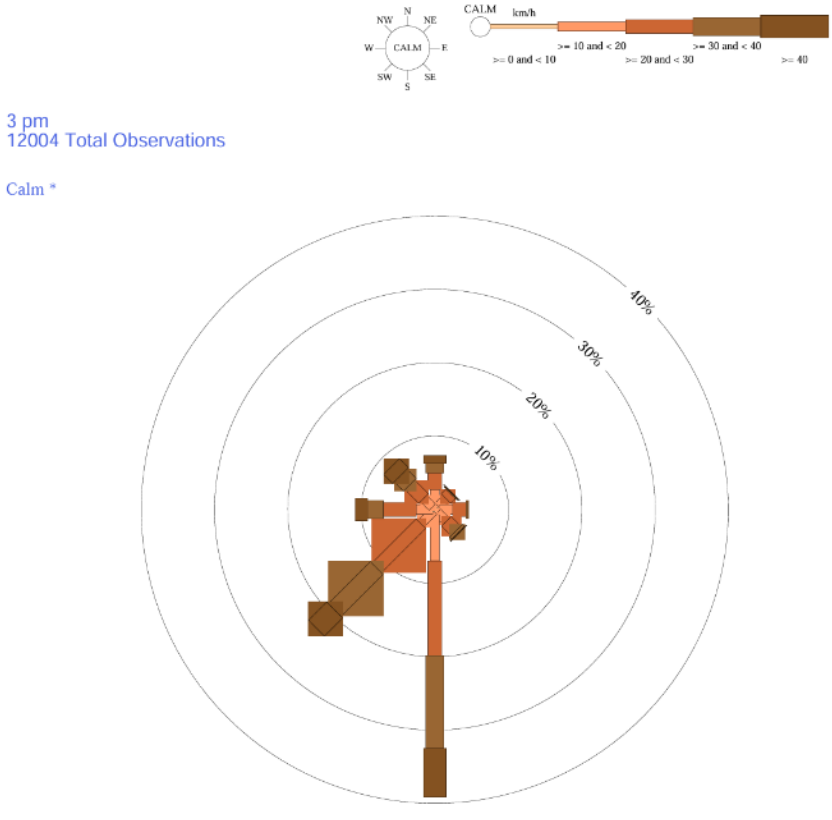

Figure 3: Wind direction and speeds measured at 3pm over 12004 daily observations (BoM 2024)

Currents measured around the Proposal site (Baird 2024) found a depth averaged peak current speed of 0.05 ms^{-1} to 0.1 ms^{-1} during neaps and 0.1 ms^{-1} to 0.15 ms^{-1} during spring tides. Current direction was relatively consistent across the tidal cycle at 80° - 100°, changing to come from northerly directions occasionally. Increasing wind speeds also seemed to strongly correlate with increasing current speeds (Baird 2024). Waves around the Island were found to be dominated by diffracted and refracted swell waves ranging from 0.4 m to 0.7 m with peak periods 12 to 18 seconds. Occasionally wind sea resulted in higher waves (0.8-0.9 m at peak wave periods of 5-10 s) arriving from the northwestern sector.

Within the Proposal area, the bathymetry is relatively shallow, up to 1.6 m at the end of the Army Groyne and decreasing to approximately 3.5 m CD depth 100 m offshore (DoT 2022). The rest of the Island is also relatively shallow, though to the west of Rottnest Island there a large drop in depth within 2 km, down to approximately -55 m at mean sea level.

2.3. Geology and geomorphology

The Island is the largest and northernmost island of the Garden Island Ridge, a rocky remnant Pleistocene ridge forming a chain of submarine reef platforms and emergent islands of approximately 12 km offshore of the Swan Coastal Plain. The Island sits within the middle shelf region of the narrow Rottnest shelf (Brooke 2010). The Proposal site consists of white medium-grained sand, well-sorted, sub-angular quartz and shell debris.

2.4. Water quality

Water quality sampling was undertaken between November and December 2023 at six locations in and around the Proposal site. Samples were analysed for turbidity (Nephelometric Turbidity Units (NTU) and total suspended solids (TSS)) in November, and in December the samples were analysed for NTU, TSS, hydrocarbons and metals. Hydrocarbons and phosphorus were all below the limit of reporting (LoR) in all samples. All metals sampled were also below the ANZG (2018) water quality guidelines except for one sample which had a high zinc concentration, however this would be considered to be an anomaly likely due to contamination from sunscreen or similar.

Turbidity at the site is very low, with profiles taken in December finding zero NTU at several sites within the proposal area. Turbidity of water samples was also measured in the laboratory in November and December 2023, which ranged between 0 and 0.66 NTU. Total suspended solids (TSS) was also found to be low, with <5.0 mg/L in all samples. This is not surprising due to the water clarity in the area during this time of year.

2.5. Sediment quality

Sediment sampling was undertaken in November 2019 (with some additional sampling in March 2020) at seven locations within the proposed dredge area (RPS 2020). Sediment samples were analysed for metals and metalloids, acid sulfate soil (ASS) parameters, pesticides, polycyclic aromatic hydrocarbons (PAHs), total recoverable hydrocarbons (TRHs) and benzene, toluene, ethyl-benzene and xylene (BTEX), nutrients and per- and poly-fluoroalkyl substances (PFASs).

Samples were taken from each 0.5 m horizon where possible, up to a depth of 1.2 m at each location. Some locations reached refusal due to hard sediment layers at approximately 1 m depth, and therefore there were a total of 17 samples (with 14 additional samples taken in March 2020 to re-analyse for PFAS due to laboratory contamination).

Particle distribution was found to be predominantly sand between 0.06 and 2 mm, with the mean median particle size being 0.242 mm (242 µm). There was only a small proportion of sediment larger than 2 mm.

The toxicants were all analysed by a NATA accredited laboratory, and the results compared to the following guideline values:

- Ecological Investigation levels (EILs) and Ecological Screening Levels (ESLs) for areas of ecological significance and public open space (NEPM 2013)
- Health Investigation Levels for residential soil access (HIL-A) (NEPM 2013 and CRC CARE 2011)
- National Assessment Guidelines for Dredging (NAGD) (Commonwealth of Australia 2009) screening levels.

All metals, metalloids, pesticides, PAHs, TRHs, BTEX, nutrients and PFAS tested were below their respective guideline values. The site is also not considered to be an ASS risk (RPS 2020). One sample being classified as potential ASS as inorganic acidity was detected. However, there was a significant amount of acid neutralising capacity, so RPS (2020) recommended that no liming would be required if onshore disposal was conducted. Therefore, the material is considered suitable for reuse as fill for the construction of the jetty (or onshore disposal if required).

2.6. Marine environmental quality – level of ecological protection

As previously described, the Rottnest Island Reserve was established under the Rottnest Island Authority Act 1987. A high level of ecological protection (LEP) has been deemed appropriate for this reserve (outside of sanctuary zones which should be maximum LEP as recommended in EPA (2016)) due to the combined pressures of boating and people and uses of the area. Therefore, a high LEP has been proposed for all Rottnest Island waters outside the sanctuary zones for management to aim for (EPA 2016). The proposed LEPs around Rottnest Island is presented in Figure 4.

In accordance with the marine environmental quality (MEQ) technical guidance, a moderate level of ecological protection may be applied to relatively small areas within inner ports and adjacent to heavy industrial premises where waste discharge and contamination from current and/or historical activities may have compromised a high level of ecological protection. Though this Proposal will increase the barge traffic, no waste discharges are expected and therefore it is expected that a high level of ecological protection will be met throughout the operations of the Proposal.

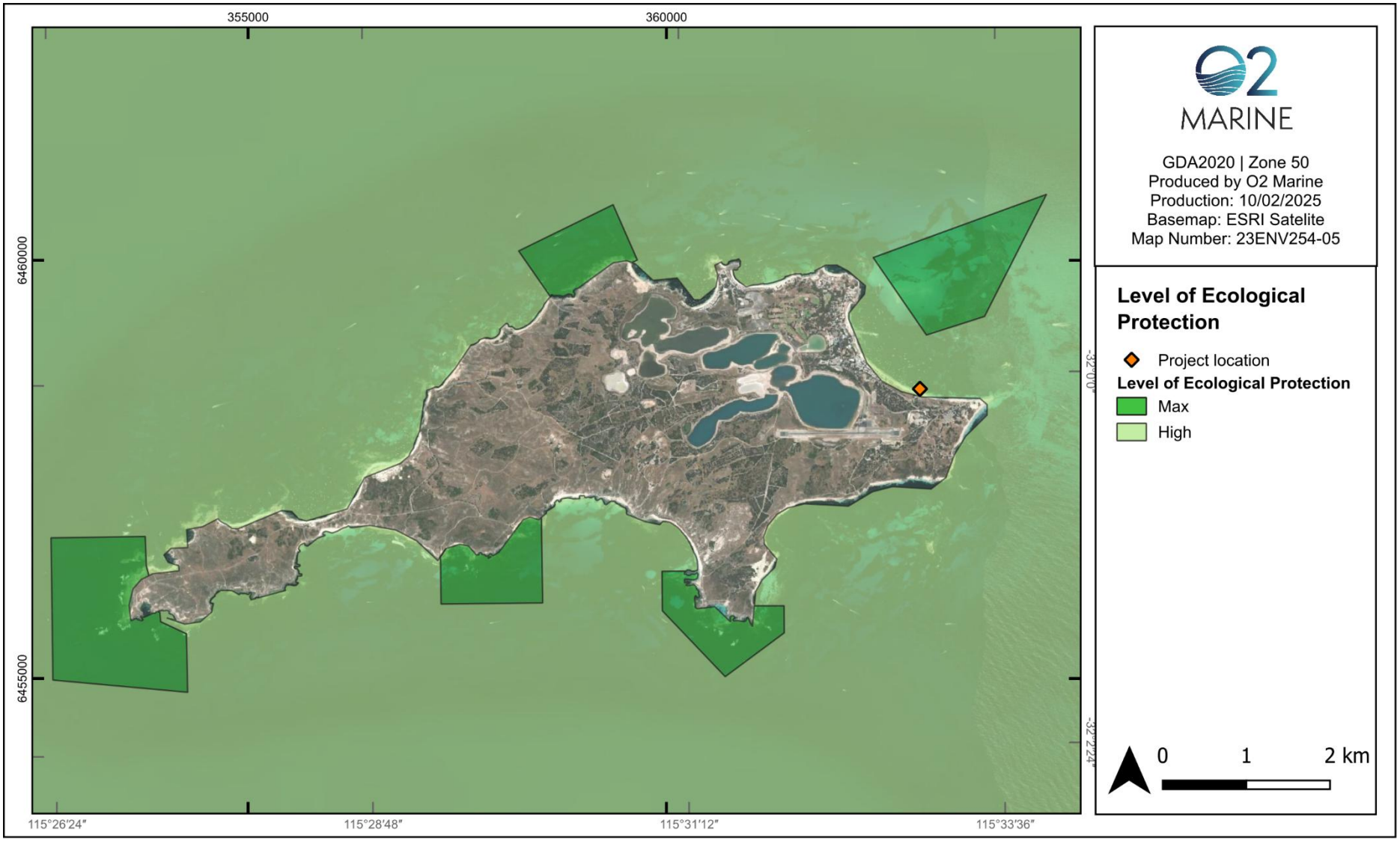

Figure 4: Levels of ecological protection around Rottnest Island

2.7. Benthic communities and habitat

In accordance with EPA (2016) a local assessment unit (LAU) should be established in order to calculate and assess the cumulative impacts of disturbance to BCH from projects. They are location specific, and would typically be approximately 50 km^2, though large or smaller areas would be considered by the EPA if well justified. An LAU around Rottnest Island has been nominated for this Proposal based on the assessment area for a previous study of the BCH by Harvey (2009). The BCH within the LAU is given in Figure 5, and Harvey (2009) identified bare substrate, seagrass, macroalgae, coral and intertidal reef within the assessment area.

A benthic communities and habitat (BCH) assessment was undertaken by RPS in 2019, updated in 2023 for the Proposal area and then updated again in early 2024 to include additional area where modelling predicted possible impacts (RPS 2024). Within South Thomson Bay, RPS (2023) conducted a finer scale survey within and around the Proposal area as shown in Figure 6. Seagrass and macroalgae species were identified and the habitats were classified by species dominance (a species was dominant if it was more than 50% covered by that species). The classification scheme is presented in RPS (2023) and the data was then used to determine BCH loss within the Proposal area and the context of the survey area. These loss calculations are shown in Table 2. Within the wider LAU, historical BCH loss was also assessed to determine a cumulative loss. Overall, it was estimated that a 1.95% loss of seagrass had occurred over time due to human activities, and the proposal would lead to an additional 0.36% loss, resulting in a cumulative loss of 2.31% over the LAU (RPS 2024).

Table 2: Areas of habitats within the development footprint (RPS 2024)

Area	Habitat (Ha)			
	Mixed seagrass	Macroalgae dominated	Sand/Sand with Wrack	Limestone reef/pavement
Field survey area (2019/2023 survey area)	108.10	10.80	42.43	1.79
Survey area (2024 plume extension survey area)	0.92	0	1.27	0.35
Total survey area	109.02	10.80	43.70	2.14
Development envelope	2.06	0	1.26	0

Figure 5: Broad scale benthic habitat within the Rottnest Island LAU (Harvey 2009)

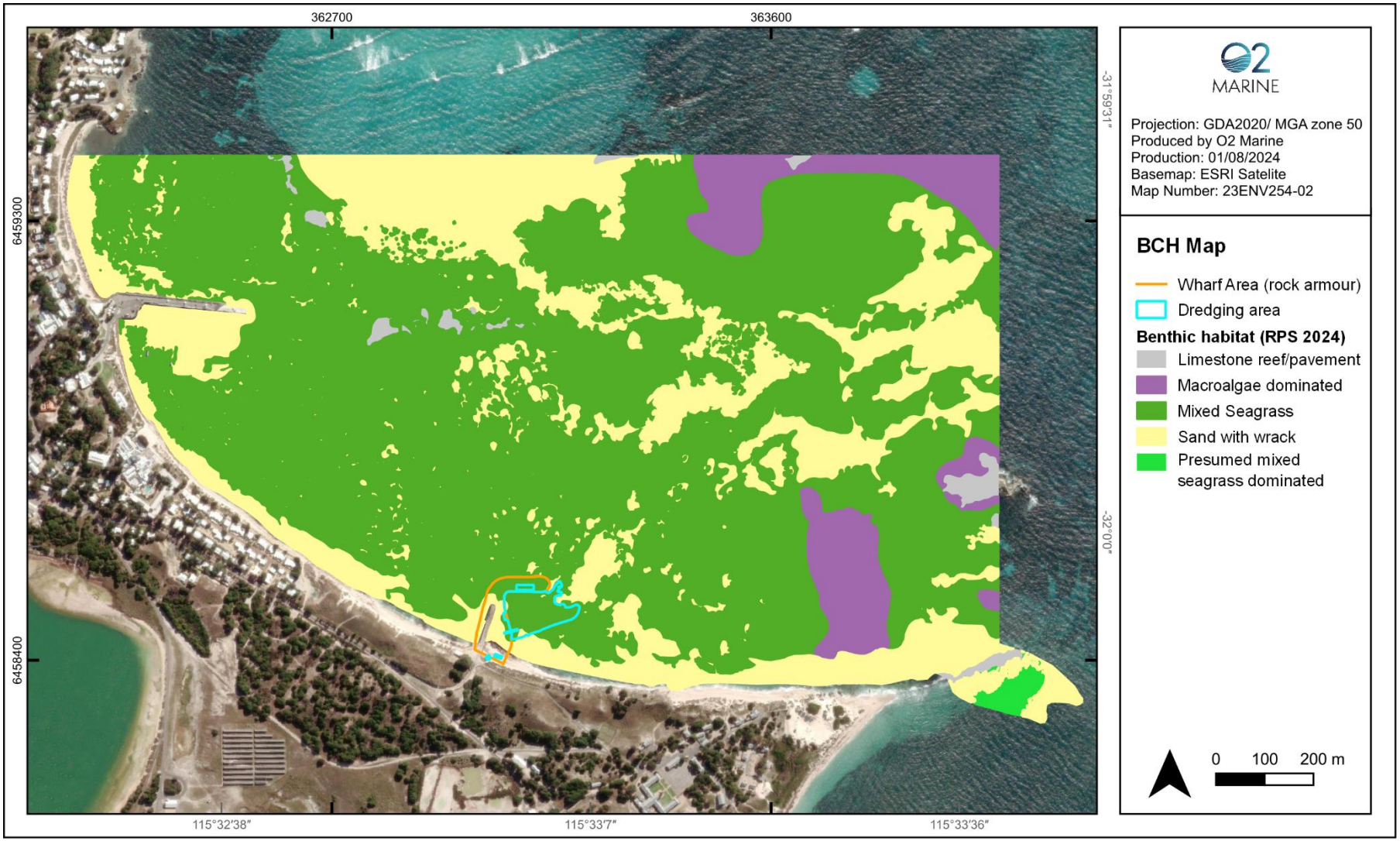

Figure 6: Benthic habitat within and around the proposal development envelope (data source: RPS 2024).

2.8. Marine fauna

A marine fauna desktop analysis was undertaken for the proposal by RPS (2023). A list of species that may occur within the proposal area was collated and included 41 threatened marine fauna species and 92 listed marine or migratory marine fauna species that may occur in Thomson Bay. Key species and their ecological windows for monitoring and management were not identified by RPS (2024a), though ecological windows for species that may occur we identified in the referral supporting document (RPS 2024b; Table 3). Of the species that may occur within the Proposal area and that can be monitored during operational activities include:

- Humpback whale (*Megaptera novaeangliae*)
- Killer whale (*Orcinus orca*)
- Pygmy blue whale (*Balaenoptera musculus brevicauda*)
- Minke whale (*Balaenoptera acutorostrata*)
- Australian sea lion (*Neophoca cinerea*)
- New Zealand fur seal (*Arctocephalus forsteri*)
- Indo-pacific bottlenose dolphin (*Tursiops aduncus*)
- Spinner dolphin (*Stenella longirostris*)
- Loggerhead turtle (*Caretta caretta*)
- Leatherback turtle (*Dermochelys coriacea*)
- Green turtle (*Chelonia mydas*).

These can often be viewed as umbrella species, so mitigation and management put into place to protect these species will also protect others that may occur within the Proposal area. Sharks, rays and fish species are occasionally visible if close enough to the surface and when weather conditions (e.g. wind, glare) and water clarity are favourable.

Table 3: Ecological windows for key marine fauna receptors as presented in RPS (2024b)

Shading= peak period, light blue shading= mammals, yellow shading= fish, green shading= birds, teal shading= reptiles

Species	J	F	M	A	M	J	J	A	S	O	N	D	Reference (RPS 2024b)
Humpback whale (north migration)													DCCEEW (2024)
Humpback whale (south migration)													DCCEEW (2024)
Pygmy blue whale (north migration)													McCauley and Jenner (2010); McCauley and Duncan (2011); Double et al. (2012; 2014)
Pygmy blue whale (south migration)													McCauley and Jenner (2010); McCauley and Duncan (2011); Double et al. (2012; 2014)
Australian sea lion													
New Zealand fur seal													
White shark foraging BIA*													DCCEEW (2024)
Scalloped hammerhead migration													López et al. (2022)
Little penguin foraging													Higgins (2003); DAWE (2020); DCCEEW (2024)

Species	J	F	M	A	M	J	J	A	S	O	N	D	Reference (RPS 2024b)
Wedge-tailed shearwater foraging													Higgins (2003); DAWE (2020); DCCEEW (2024)
Caspian tern foraging													Higgins (2003); DAWE (2020); DCCEEW (2024)
Pacific gull foraging													Higgins (2003); DAWE (2020); DCCEEW (2024)
Bridled tern foraging													Higgins (2003); DAWE (2020); DCCEEW (2024)
Roseate tern foraging													Higgins (2003); DAWE (2020); DCCEEW (2024)
Fairy tern foraging													Higgins (2003); DAWE (2020); DCCEEW (2024)
Green turtle													
Leatherback turtle													
Loggerhead turtle													
* noting that the white shark BIA does not overlap with the Proposal.													

2.9. Terrestrial environmental quality

Terrestrial environmental quality is an EPA environmental factor, however it has not been identified as a key factor for this Proposal. RPS (2025) conducted a search of the DWER Contaminated Sites Database and found no known contaminated sites within the Proposal DE. The closest registered contaminated sites is Site 39676 (portion of Lot 10976 on Deposited Plan 216860) located approximately 0.9 km west of the Proposal DE. Hydrocarbons have been found to be present within the groundwater below the registered contaminated site, though the site has been remediated so that it is suitable for public open spaces and public roads and classified as 'remediated for restricted use'.

A review of the DWER ASS mapping database also indicates that there is a low risk of ASS occurring within the development envelope (RPS 2024).

2.10. Terrestrial flora and vegetation

The condition of the vegetation across the Proposal area is largely good, with some mixed patches of degraded vegetation (RPS 2024). One vegetation unit (MIAp*Td) is considered to be representative of the State-listed Threatened Ecological Community (TEC) *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain and is considered to be of State significance. This vegetation unit is also representative of a pre-European vegetation association and/or complex that has less than 30% of the original extent remaining and is therefore considered regionally significant. Two other vegetation units were described to cover the DE (ApAf*Td and Sc*TdSl) which were both considered Good to Degraded condition. During the vegetation survey, 17 flora species were recorded, including 4 introduced species (RPS 2024). None of these were Declared Organisms or Weeds of National Significance.

2.11. Terrestrial fauna

A total of 76 conservation significant fauna species were identified as having a likelihood of occurrence within the site. One conservation significant species was recorded within the Proposal area, being the quokka (Kwoka; *Setonix brachyurus*) listed as Vulnerable (VU) under the EPBC Act and BC Act. Four fauna species are considered as having the potential to occur within the Proposal area including:

- Osprey (*Pandian haliaetus*) (Migratory)
- Rottnest Island bobtail (*Tiliqua rugosa konowi*)(Vulnerable)
- Perth slider (*Lerista Lineata*)(Priority 3 under BC Act only)
- Rottnest Island dugite (*Pseudonaja affinis exilis*)(Priority 4 under BC Act only)

Two fauna habitat types were recorded within the Proposal area, namely:

- Trees and tall shrubs over low shrubs, grasses and herbs on sand dunes
- Low shrubs over grasses and herbs on sand dunes.

Both of these habitat types are suitable and potentially used by each of the conservation significant species listed above.

2.12. Social surroundings

The local community, visitors and tourists utilise the area, including recreational boat users who hold existing moorings within the vicinity of the Army Groyne. The site contains cultural, spiritual and heritage values associated with the broader cultural indigenous significance with Wadjemup/ Rottnest Island, and the historical heritage values of the Army Groyne.

Wadjemup/Rottnest Island and the surrounding marine waters are within a reserve for public recreation and conservation. Recreational fishing for species including rock lobster, abalone, squid, cuttlefish, octopus and crabs occur, with spear fishing and commercial or amateur net fishing prohibited.

A search of the Department of Planning and Land Heritage (DPLH) Aboriginal Heritage Inquiry System database did not identify any Aboriginal cultural heritage (ACH) within or adjacent to the DE. The closest ACH is located approximately 400 m away and will not be impacted by the Proposal.

An Ethnographic Aboriginal survey was undertaken in 2019 (Brad Goode and Associates 2019) and found no new ethnographic sites were identified. However, representatives of the Whadjuk NTC group identified the potential for artefacts to occur in the subsurface and potential burials could be located in the dunes close to the DE. However, it was recommended in Brad Goode and Associates (2019) that the Proposal could proceed without undue risk of breaching the *Aboriginal Heritage Act 1972* in relation to ethnographic sites and places.

3. Roles and responsibilities

The roles and responsibilities for the implementation of the OEMP are summarised in Table 4.

Table 4: Roles and responsibilities of key personnel

Position	Responsibility
Project Manager	• Overall responsibility for implementation of this OEMP • Overall responsibility for complying with relevant legislation, standards and guidelines • Ensures dredging activities are conducted in an environment safe for both site personnel and the public.
Environment Manager	• Complies with the requirements of this OEMP • Provides environmental issues in relation to operations • Oversee implementation of environmental controls and monitoring programs within this OEMP • Prepares environmental monitoring reports • Provides advice with respect to environmental issues as required • Responsible for the implementation of the environmental monitoring program and inspections
Manager Approvals and Compliance	• Complies with the requirements of this OEMP • Provides environmental issues in relation to operations • Oversee implementation of environmental controls, inspections, audits and management actions in this OEMP • Completes compliance reporting requirements

Position	Responsibility
	• Prepares environmental monitoring reports • Responsible for environmental compliance reporting • Reports on environmental performance for the project to key stakeholders • Provides advice with respect to environmental issues as required • Responsible for reporting all environmental non-compliance incidents.
Barge Contractors	• Complies with the requirements of this OEMP • Implements the management actions of this OEMP • Ensures adequate training of all staff within their area of responsibility • Ensures all equipment is adequately maintained and correctly operated • Responsible for reporting all environmental incidents to the Department of Transport (DoT) within 24 hours in accordance with DoT incident reporting procedures • Ensures barge activities are conducted in an environment safe for both site personnel and the public.
All persons involved in the Proposal	• Comply with the requirements of this OEMP • Comply with all legal requirements under the approval's documents and relevant Acts • Exercise a Duty of Care to the environment at all times • Report all environmental incidents.

4. Environmental factors and objectives

The key environmental factors and objectives to be managed under this OEMP have been derived from the Statement of environmental principles, factors, objectives and aims of EIA (EPA 2021), which outlines objectives aimed at protecting all environments (Themes) including Sea, Land, Water, Air and People. The Key Environmental Factors and EPA Objectives to be managed under this OEMP are listed below:

- Benthic communities and habitats
- Marine environmental quality
- Marine fauna
- Coastal processes
- Flora and vegetation
- Terrestrial fauna
- Social surroundings

The proposal specific Environmental Protection Outcomes (EPOs) and Management Targets (MTs) for each of these key environmental factors are outlined in Table 5.

Table 5: Potential environmental impacts from operations and associated proposal specific Environmental Protection Outcomes and Management Targets

Environmental Factor	EPA Objective	Potential Environmental Impact Pathway	Environmental Protection Outcome (EPO)	Management Target (MT)	Risk Management Strategy
Marine Environmental Quality (MEQ)	To maintain the quality of water, sediment and biota so that	Toxicants, such as heavy metals and metalloids, can enter the marine system through vessel maintenance activities, breakdown of anodes, substances leaching out of marine debris and degradation of antifoul coatings.	No reduction in marine environmental quality (water, sediment and biota) from a High Level of Ecological Protection	Toxicants (metals) will meet the 99% species protection limit to meet the High LEP for water quality (except for	Refer to Table 6

Environmental Factor	EPA Objective	Potential Environmental Impact Pathway	Environmental Protection Outcome (EPO)	Management Target (MT)	Risk Management Strategy
	environmental values are protected.	They may also enter the marine environment from different stormwater entrances due to the wharf structure	within and adjacent to the DE as a result of the Proposal	cobalt which needs to meet the 95% SPL) Toxicants (metals) will meet the ISQG-low for sediments	
		Disturbance of sediments from vessel operations in shallow waters causing temporary increase in turbidity Changes to load, bioavailability and/or concentration of nutrients.			
		Hydrocarbon release into the marine environment from a vessel spill and or bunkering/refuelling operations. Hydrocarbons may also enter the marine environment through discharge from land, via landside vehicles or potential spill incident	No reported hydrocarbon spills or release of waste into the marine environment from operational activities.	No hydrocarbon spills to the marine environment. No increase in human-made rubbish/debris entering the marine environment from the Proposal (both from vessels and landside activities) No release of waste into the marine environment.	
		Disturbance of sediment from maintenance dredging causing increased turbidity and potential release of contaminated sediment	If maintenance dredging is undertaken, marine environmental quality (i.e. water and sediment	Toxicants (metals) will meet the ISQG-low for sediments	

Environmental Factor	EPA Objective	Potential Environmental Impact Pathway	Environmental Protection Outcome (EPO)	Management Target (MT)	Risk Management Strategy
			quality) will remain consistent with triggers outlines in the Rottnest Barge Landing maintenance dredging framework (to be prepared prior to maintenance activities being undertaken).		
Benthic Communities and Habitats	To protect BCH so that biological diversity and ecological integrity are maintained.	Increased barge traffic and activities within the proximity to BCH can contribute to a reduction in seagrass through changes to local sediment transport, increased localised turbidity and/or uprooting/disturbance of seagrasses Hydrocarbons or other waste can enter the marine system through vessels or a potential spill incident (from barges, maintenance dredge vessels and other vessels) resulting in impacts to the health of seagrass meadows. Temporary increased turbidity due to maintenance dredging within berth area.	No irreversible impacts to BCH outside the development envelope during operational activities associated with the Proposal, such as maintenance dredging activities (Figure 1).	No loss of BCH outside the DE No hydrocarbon/toxicant/liquid waste spill Maintenance dredging and disposal of the material to occur within the development envelope. No introduced marine species recorded attributable to the Proposal	Refer to Table 7.

Environmental Factor	EPA Objective	Potential Environmental Impact Pathway	Environmental Protection Outcome (EPO)	Management Target (MT)	Risk Management Strategy
Marine Fauna	To protect marine fauna so that biological diversity and ecological integrity are maintained.	Removal, loss, or disturbance of individual organisms of a specific species. Increased noise for vessel traffic potentially leading to behavioural response, injury or fatality. Collision with marine fauna leading to injury or fatality Introduction of marine pests/other marine species due to vessel movements from other locations. Hydrocarbons can enter the marine system through vessels or a potential spill incident resulting in direct or indirect impacts to marine fauna. Increased human made rubbish/debris, including solid wastes, hazardous wastes, and grey water resulting in direct or indirect impacts to marine fauna. Artificial lighting from the barge facility can disrupt natural light cycles for coastal organisms, including marine fauna and migratory birds, potentially affecting behaviour, reproduction, and habitat use.	No reported loss of marine fauna habitat outside of the DE attributable to the operations of the Proposal. No reported death or injury to marine fauna from vessel strike or other activities associated with operational activities. No reported introduction or establishment of IMS as a result of operational activities associated with the Proposal. No reported impacts to marine fauna as a result of hydrocarbon spill or release of waste associated with operational activities including entanglement or ingestion of waste. No changes in marine fauna behaviour	No impacts to marine fauna habitat (BCH) outside the development envelope associated with operations No introduced marine species recorded No hydrocarbon/toxicant spills entering the marine environment No increase to human made rubbish/debris entering the marine environment No death or injury to marine fauna as a result of vessel activities including noise/ vessel strike No disturbance to marine fauna from light pollution No recorded loss of marine fauna species attributable to operations	Refer to Table 8.

Environmental Factor	EPA Objective	Potential Environmental Impact Pathway	Environmental Protection Outcome (EPO)	Management Target (MT)	Risk Management Strategy
			attributable to the lighting requirements of the Proposal associated with operations.		
Coastal processes	To maintain the geophysical processes that shape coastal morphology so that the environmental values are protected	Changes in sediment transport patterns due to the additional structure of the jetty can alter coastal erosion, sediment deposition, shoreline morphology, coastal ecosystems and sediment-dependent species Interruption to longshore sediment transport resulting in the potential for sediment bypassing the structure from east to west to be trapped at the proposed barge development within the basin Interruption to seagrass wrack transport including deposition sites resulting in accumulation of seagrass on the eastern side of the breakwater.	No increase in wrack or sediment accumulation or beach erosion above natural levels on nearby beaches within South Thomson Bay which will result in a reduction in social amenity and recreational values (including odour). No increase in wrack or sediment accumulation or beach erosion on nearby beaches within South Thomson Bay which will result in loss of roosting	No persistent accumulations of shoreline seagrass wrack beyond natural levels No persistent accumulations of sediment beyond natural levels No social amenity reports from the general public No reports of navigational impacts due to wrack accumulation	Refer to Table 9.

Environmental Factor	EPA Objective	Potential Environmental Impact Pathway	Environmental Protection Outcome (EPO)	Management Target (MT)	Risk Management Strategy
		Reduction in wave height within the basin area and potentially along the shoreline to the western side of the breakwater Reflection of waves off structures resulting in increased wave energy in the vicinity of the structure	habitat for seabirds and shorebirds. No increase in wrack or sediment accumulation or beach erosion on nearby beaches within South Thomson Bay which will result in a reduction of the extent of BCH outside of the development envelope.		
Flora and vegetation	To protect flora and vegetation so that biological diversity and ecological integrity are maintained	Uncontrolled vehicle movement impacting retained native vegetation Spread of weeds and disease within the area (i.e. vehicles and personnel movements) Spread of litter in vegetated areas	Direct impacts to native vegetation resulting from the Proposal will be confined to the DE Direct impacts to native vegetation (MIAp*Td) analogous with the TEC, *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain will	Control land vehicle movement to designated roadways and hard stand areas to ensure no direct impacts to native vegetation outside the DE. No introduction of weed species. Provide waste disposal facilities.	Refer to Table 10.

Environmental Factor	EPA Objective	Potential Environmental Impact Pathway	Environmental Protection Outcome (EPO)	Management Target (MT)	Risk Management Strategy
			be confined to the DE and will not exceed 0.23 ha. No reduction in the extent or modification of the TEC, *Callitris preissii* (or *Melaleuca lanceolata*) forests and woodlands of the Swan Coastal Plain outside the DE as a result of the Proposal No introduction of new weed species attributable to the Proposal		
Terrestrial fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained	Vehicle movement could result in injury/death to native fauna Introduction and/or spread of weeds/disease impacting fauna habitat Increased human presence in the vicinity has the potential to result in increased rubbish/debris/litter affecting surrounding terrestrial fauna.	No Proposal-related disturbance of conservation significant terrestrial fauna or fauna habitat outside the DE No introduction of new weed species attributable to the Proposal	Vehicles and people confined to hard stand and operational areas. Provide waste disposal facilities. No introduction of weed species Vehicles travel within prescribed speed limits.	Refer to Table 11.

Environmental Factor	EPA Objective	Potential Environmental Impact Pathway	Environmental Protection Outcome (EPO)	Management Target (MT)	Risk Management Strategy
			No increase in incidents of terrestrial fauna injury or death during operations of the Proposal		
Social surroundings	To protect social surroundings from significant harm	Disturbance to existing mooring licences from increased noise, lighting, odour and dust due to operations of barges and additional traffic Removal and relocation of vessel moorings Potential disturbance to swimmers from increased marine traffic Freight operations may also generate noise, odour and visual intrusions (lighting), potentially affecting the amenity of recreational users (i.e. boat users). The highest noise emissions from the current facility were associated with container set-down noise and vehicle movement.	No exceedance of Environmental Protection (Noise) Regulations 1997 No reduction in recreational fishing, outside the DE and ZoMI which are attributable to the Proposal The risk for disturbance to UXO is managed so that there is not a significant risk for injury to people or wildlife, or damage to infrastructure No impacts to registered ACH sites, either through direct disturbance or	Limit the impact on social surroundings, including noise, dust and visual intrusion (lighting) through controlled vehicle (ADR compliant) movement procedures to avoid public and community issues Operational activities occur within nominated working hours. Limit issues related to freight operations that may cause potential negative impacts on social surroundings Ensure waste disposal measures are implemented	Refer to Table 12

Environmental Factor	EPA Objective	Potential Environmental Impact Pathway	Environmental Protection Outcome (EPO)	Management Target (MT)	Risk Management Strategy
			indirect impacts to ACH within South Thomson Bay No impacts to amenity values from noise, odour and dust within South Thomson Bay during construction and operation of the Proposal which result in a reduction in recreational values.	and rubbish and litter is prevented to have no impact on visual amenity Ensure local amenity is protected and public safety measures are undertaken Minimise impacts to mooring holders No impact to social surroundings from odour attributable to the Proposal	

5. Monitoring and Management

During operational activities, ongoing monitoring will be undertaken to confirm that the EPOs and MTs are being met. The potential environmental impacts identified above in Table 5 have been assigned monitoring and management actions to measure compliance against each of the EPOs and MTs. Monitoring programs have been developed for the following environmental receptors:

- Marine environmental quality including water and sediment quality
- Seagrass and macroalgae health
- Marine fauna
- Seagrass wrack accumulation.

Management measures for each environmental factor (EPA 2018) are detailed below and also includes where these monitoring programs are relevant to an environmental factor.

5.1. Marine environmental quality

The management actions proposed to minimise potential impacts on the environmental factor 'Marine Environmental Quality' are described in Table 6.

Table 6: Management actions to minimise impacts on MEQ

Marine environmental quality					
Activity	Operational activities				
Potential Impacts	• Toxicants, such as heavy metals and metalloids, can enter the marine system through vessel maintenance activities, breakdown of anodes, substances leaching out of marine debris and degradation of antifoul coatings. • They may also enter the marine environment from different stormwater entrances due to the wharf structure • Disturbance of sediments from vessel operations in shallow waters causing temporary increase in turbidity • Changes to load, bioavailability and/or concentration of nutrients. • Hydrocarbon release into the marine environment from a vessel spill and or bunkering operations. • Hydrocarbons may also enter the marine environment through discharge from land, via landside vehicles or potential spill incident • Disturbance of sediment from maintenance dredging causing increased turbidity and potential release of contaminated sediment				
	Management Actions	Environmental Performance			
Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
Toxicants (metals) will meet the 99% species protection limit to meet the High LEP for water quality (except for cobalt which needs to meet the 95% SPL) Toxicants (metals) will meet the ISQG-low for sediments	• Implement the MEQ monitoring program in Appendix B.1 • Implement Department of Transport's Maritime Environmental Emergency Response (MEER) oil spill response protocols. • Implement standard waste minimisation and reduction strategies, including providing	RIA	• Visual monitoring to be undertaken by vessel crew • Reactive management to be conducted as required for any spills in accordance with Spill Prevention and Response Plan (RIA 2025) • Hydrocarbon spills into the marine environment be immediately reported to MEER (ph. 9480 9924). • Reporting of any incidents, e.g. possible impacts to water quality	• Visual monitoring throughout operations, reactive management following an incident • MEQ monitoring to be done quarterly for at least the first two years	• Further monitoring to be undertaken • Investigations into spills • Investigation into level of protection set and consider the need to change to "moderate" level of protection

Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
No hydrocarbon/ toxicant spills from vessels No increase to human-made rubbish/debris entering the marine environment from vessels No significant changes to available nutrients entering the marine environment from land activities	facilities for waste disposal. • Implement prevention and response actions in accordance with the Spill Prevention and Response Plan (RIA 2025) • Implement routine removal and off-site disposal of wastes in accordance with State and local policies and procedures. • No liquid waste to be discharged anywhere in Rottnest Island waters, including waste from marine sanitation devices.		with relation to barge traffic operations due to waste or chemical spill • Requirement for MEQ reactive monitoring after a hydrocarbon-chemical spill incident to be considered on a case by case basis.		

5.2. Benthic Communities and Habitats

The management actions to minimise potential impacts on the environmental factor 'Benthic Communities and Habitat' are described in Table 7.

Table 7: Management actions to minimise impacts on benthic community habitats

Benthic Communities and Habitats					
Activity	Dredging and disposal operations				
Potential Impacts	• Indirect impacts to BCH from changes in local sediment transport increased localised turbidity and/or uprooting/disturbance of seagrass from increased barge traffic and activities • Impacts to seagrass meadows from hydrocarbon spill or waste entering the marine environment.				
	Management Actions	Environmental Performance			
Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
No loss of BCH outside the DE	Implement speed and wake restrictions (as per Rottnest Island boating guidelines) for barges operating in sensitive coastal areas to minimize shoreline erosion and disturbance to intertidal and shallow BCH. BCH monitoring to be undertaken as required in accordance with the MEQ monitoring program.	RIA	• Validate positioning and vessel monitoring system • Reporting of any incidents, e.g. water quality and BCH with relation to barge traffic operations • Reactive BCH monitoring if MEQ monitoring triggers are exceeded	• Throughout operations	• Investigation of incident, determine appropriate management actions if required
Maintenance dredging and disposal of the material to occur within the DE	Employ high-resolution positioning system to control dredge operations Prepare a maintenance dredging plan including the Rottnest Barge Landing maintenance dredging framework, to be	RIA	• Maintenance Dredging Management Plan with maintenance dredging framework.	• Prior to and throughout maintenance dredging.	• Water quality and BCH monitoring to be undertaken in accordance with the Maintenance Dredging Management Plan.

Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
	prepared prior to the commencement of maintenance dredging				
No hydrocarbon/ toxicant/ liquid waste spill	Implement Department of Transport's Maritime Environmental Emergency Response (MEER) oil spill response protocols. Implement standard waste minimisation and reduction strategies, including providing facilities for waste disposal. Implement prevention and response actions in accordance with the Spill Prevention and Response Plan (RIA 2025) Implement routine removal and off-site disposal of wastes in accordance with State and local policies and procedures. No liquid waste to be discharged anywhere in Rottnest Island waters, including waste from marine sanitation devices.	RIA	• Visual monitoring to be undertaken by vessel crew • Reactive management to be conducted as required for any spills in accordance with Spill Prevention and Response Plan (RIA 2025) • Hydrocarbon spills into the marine environment be immediately reported to MEER (ph. 9480 9924) • Reporting of any incidents, e.g. possible impacts to water quality with relation to barge traffic operations due to waste or chemical spill.	• Visual monitoring throughout operations, reactive management following an incident.	• Further monitoring to be undertaken • Investigations into spills.
No introduced marine species recorded attributable to the Proposal	Use the WA DPIRD 'Vessel Check' risk assessment (https://vesselcheck.fish.wa.gov.au) and submit to RIA (including supporting documentation) for all dredging and support vessels (i.e., Dredge vessel and Barges) that mobilise from interstate or	Vessel Master RIA	• Vessel inspections • Inspection of jetty infrastructure in accordance with Rottnest Island Management Plan	• Prior to vessel(s) entering the Proposal area • As required for maritime infrastructure maintenance	• Notify RIA and DPIRD of the introduction of IMPs within 12 hours (1800 815

Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
	international waters. Risk assessment must indicate that the vessel poses a low risk of IMP to the Proposal area. All vessels will have a ballast water management plan and ballast water exchanges will be in accordance with IMO requirements and the Commonwealth Biosecurity Act 2015.		2023-28: Maintain Maritime Infrastructure requirements		507) (See Appendix B.4.2) • If pest is identified record location, date and time, size, colour, water depth, environment (e.g. beach, sand etc), and take a photo

5.3. Marine Fauna

The management actions proposed to minimise potential impacts on the environmental factor 'Marine Fauna' (including MNES) are described in Table 8.

Table 8: Management actions to minimise impacts on marine fauna

Environmental Factor	**Marine fauna**				
Activity	General operations				
Potential Impacts	• Injury, death or behavioural change of marine fauna as a result of operational activities (e.g. barge movements) • Injury or death of marine fauna due to vessel movement (strike) • Habitat disturbance or loss from operations • Introduction of marine pests/other marine species due to vessel movements from other locations • Direct impacts from light pollution • Direct or indirect harm to marine fauna from rubbish/debris, including solid wastes, hazardous wastes, and grey water generated by operations				
	Management Actions		Environmental Performance		
Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
No impacts to marine fauna habitat (BCH) outside the development envelope associated with operations	Operations and vessel movements will be undertaken to minimise disturbance of seagrass wrack and impacts to the seabed outside of the DE. BCH monitoring outside of the DE will be undertaken in accordance with Section 5.2	RIA Barge contractor	• Vessel logs • BCH in accordance with Section 5.2	• BCH in accordance with Section 5.2	• Reactive marine fauna monitoring in the event of BCH threshold exceedance in accordance with Appendix B.4.3
No introduced marine species recorded	• Use the WA DPIRD 'Vessel Check' risk assessment (https://vesselcheck.fish.wa.gov.au) and submit to RIA (including supporting documentation) for all dredging and support vessels (i.e., Dredge vessel and	Vessel Master RIA	• Vessel inspections • Inspection of jetty infrastructure in accordance with Rottnest Island	• Prior to vessel(s) entering the Proposal area • As required for maritime	• Notify RIA and DPIRD of the introduction of IMPs within 12 hours (1800 815

Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
	Barges) that mobilise from interstate or international waters. Risk assessment must indicate that the vessel poses a low risk of IMP to the Proposal area. • All vessels will have a ballast water management plan and ballast water exchanges will be in accordance with IMO requirements and the Commonwealth Biosecurity Act 2015.		Management Plan 2023-28: Maintain Maritime Infrastructure requirements	infrastructure maintenance	507) (See Appendix B.4.2) • If pest is identified record location, date and time, size, colour, water depth, environment (e.g. beach, sand etc), and take a photo
No hydrocarbon/toxicant spills entering the marine environment	Implement Department of Transport's Maritime Environmental Emergency Response (MEER) oil spill response protocols. Implement standard waste minimisation and reduction strategies, including providing facilities for waste disposal. Implement prevention and response actions in accordance with the Spill Prevention and Response Plan (RIA 2025) Implement routine removal and off-site disposal of wastes in accordance with State and local policies and procedures. No liquid waste to be discharged anywhere in Rottnest Island waters, including waste from marine sanitation devices.	RIA	• Visual monitoring to be undertaken by vessel crew • Reactive management to be conducted as required for any spills in accordance with Spill Prevention and Response Plan (RIA 2025) • Hydrocarbon spills into the marine environment be immediately reported to MEER (ph. 9480 9924) • Reporting of any incidents, e.g. possible impacts to water quality with relation to barge traffic operations due to waste or chemical spill.	• Visual monitoring throughout operations, reactive management following an incident.	• Further monitoring to be undertaken • Investigations into spills. • Tiered management framework as per Appendix B.

Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
No increase to human made rubbish/debris entering the marine environment	Manage the correct disposal and storage of waste by ensuring the work area is tidy and all rubbish is taken away from the site Avoid and reduce waste generation where practicable, by separating waste and taking to appropriate waste treatment/recycling centres Please refer to Section 5.1	RIA	• Visual monitoring to be undertaken by vessel crew and reactive management to be conducted as required for any spills • Please refer to Section 5.1	• Throughout operations as per Section 5.1	• Tiered management framework as per Appendix B.
No death or injury to marine fauna as a result of vessel activities including noise/vessel strike	• Comply with the RIA and DoT operational requirements including 5 knot speed restrictions for barges and other vessels operating within the Rottnest Island 5 knots speed limit restriction area to minimise disturbance to marine fauna habitats and vessel will abide by the vessel approach distances (See Appendix B.4.1)	RIA Vessel Master Barge contractor	• Reporting of any incidents, e.g. vessel strikes (See Appendix B.4.1) • Vessel master and/or trained crew to monitor for marine fauna during transit (See Appendix B.4.1) throughout operations.	• Throughout operations	• Marine fauna interactions that result in serious injury or facility/vessel strikes to be reported to DBCA (within 24hours (08) 9474 9055) (See Appendix B.4.2)

No disturbance to marine fauna from light pollution	• Utilize low impact lighting fixtures and shielding techniques to reduce unnecessary nighttime lighting and minimize disruption to natural light cycles for coastal organisms. If unshielded fittings are used, lighting
	• Operational lighting to follow best practice measures as per the National Light Pollution Guidelines for Wildlife (DCCEEW 2023) including:
	  • Only add light for specific purposes (e.g. navigation and safety)
	  • Use adaptive light controls to manage light timing, intensity, and colour
		RIA
		Vessel master
			• Inspection/audit post-construction to confirm lighting, including a visual inspection of the facility lighting from the shoreline and the Project infrastructure
			• Implement changes to lighting practices if needed, to mitigate light pollution and protect sensitive marine fauna habitats.
				• As required following - installation of lighting or the modification or upgrading of the lighting
				• Throughout operations
					• Lighting to be adapted if non-conformance is reported

Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
	• Light only the object or area intended – keep lights close to the ground, directs and shielded to avoid light spill • Use the lowest intensity lighting appropriate for the task • Use non-reflective, dark-colours surfaces • Use lights with reduced or filtered blue, violet, and ultra-violet wavelengths. • Lights should be directed to light specified area at the barge facility. • Lighting on the barge facility should be kept to a minimum that is required for safe operation for vessels and infrastructure.				
No recorded loss of marine fauna species attributable to operations	• A community complaints procedure will be implemented for the life of the proposal and the community will be notified of how to make a complaint/ report a marine fauna incident • If MEQ and BCH outcomes are not being achieved a marine fauna survey may need to be undertaken in accordance with Appendix B.4. • The reactive marine fauna monitoring will be completed in line with RIAs Rottnest Island Marine Conservation Action Plan 2022-2032 (see Appendix B.4.3).	RIA	• Complaints register reporting as required. • Marine fauna survey report • Findings to also be included in Annual summary report • Marine fauna deaths or fish kills to be report as outlined in Appendix B.4.2	• As required	• During investigation of incident communication is to be sent out at all operators to be on high alert while incident is under investigation. • Reactive marine fauna monitoring in the event of BCH threshold exceedance in accordance with Appendix B.4.3

5.4. Coastal Processes

The management actions proposed to minimise potential impacts on the environmental factor 'Coastal Processes' are described in Table 9.

Table 9: Management actions to minimise impacts on coastal processes

Environmental Factor	**Coastal Processes**				
Activity	General barge landing operations				
Potential Impacts	• Changes in sediment transport patterns due to the additional structure of the jetty can alter coastal erosion, sediment deposition, shoreline morphology, coastal ecosystems and sediment-dependent species • Interruption to longshore sediment transport resulting in the potential for sediment bypassing the structure from east to west to be trapped at the proposed barge development within the basin • Interruption to seagrass wrack transport including deposition sites resulting in accumulation of seagrass on the eastern side of the breakwater. • Reduction in wave height within the basin area and potentially along the shoreline to the western side of the breakwater • Reflection of waves off structures resulting in increased wave energy in the vicinity of the structure				
	Management Actions		Environmental Performance		
Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
No persistent accumulations of shoreline seagrass wrack beyond natural levels No persistent accumulations of sediment beyond natural levels	Implement seagrass wrack and sedimentation monitoring program including photographs of the area as per Appendix B.3 and the Coastal Hazard Risk Management and Adaption Plan (Baird 2025). Implement amenity monitoring as per MEQ monitoring program in Appendix B.1.	RIA	• Photographs of the seagrass wrack and sedimentation within and surrounding the development envelope to be included in compliance	• Refer to Appendix B.3.	• Removal of seagrass wrack from the DE • Removal of additional sedimentation from the DE • Public feedback and complaints received (e.g. via the email enquiries@rottnestisland.com) to be investigated and further management to be considered

Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
No social amenity reports from the general public No reports of navigational impacts due to wrack accumulation			reports as per Appendix B.3. • Compliance reports as per Appendix B.3 • Public feedback and complaints register		

5.5. Terrestrial flora and vegetation

The management actions proposed to minimise potential impacts on the environmental factor 'terrestrial flora and vegetation' are described in Table 10.

Table 10: Management actions to minimise impacts on terrestrial flora and vegetation

Environmental Factor	**Terrestrial flora and vegetation**				
Activity	General Proposal Operations				
Potential Impacts	• Impacts on vegetation from vehicle movement • Spread of weeds and disease within the area (i.e. vehicles and personnel movements) • Spread of rubbish in vegetated areas				
	Management Actions		Environmental Performance		
Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
Control land vehicle movement to designated roadways to ensure no direct impacts to native vegetation outside the DE	Ensure access clearly marked, via paved road and laydown/ hardstand area.	RIA	• Records of vehicle movements • Reporting of any observations/ incidents of vehicle-related impacts on flora and vegetation	• Fortnightly	• Install barrier fencing or bollards. • Provide education and training to staff.
No introduction of weed species to the site or impacts to vegetation as a result of operations	• Ensure site access and laydown areas for vehicles and plant is arranged to utilise designated tracks and existing areas cleared of vegetation to minimise vegetation disturbance. • Ensure all applicable vehicles and plant remains within designated tracks, works areas, and laydown areas.	RIA	• Visual inspection of earth moving mobile equipment and vehicles prior to leaving site for evidence of weed contamination. • Inspection/audit verify monthly spot checks of	• Monthly spot checks of mobile equipment and vehicles	• Conduct weed spraying program to eliminate introduced weed. • Provide education and training to staff.

Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
	• All operational personnel will be made aware of operational boundaries through the induction / training process. • Vehicle inspection on site entry and exit to ensure the vehicle is free from obvious soil/organic material prior. • All machinery to be cleared of soil and plant material. Cleaning will occur at a suitable designated cleaning point with waste removed from the site (as required when detected). • All personnel will be made aware of weed management practices through the induction / training process. • Weed and seed certificates to be provided for all vehicles and machinery prior to first mobilisation on Rottnest Island.		vehicles, plant and equipment enter site clean, including boots, and are regularly maintained • Biannual inspection of vegetation immediately surrounding the DE for weeds and vegetation condition (up to 25 m surrounding the DE) • Any pruning of native vegetation (e.g. for safety or fire purposes) to use internal RIA vegetation removal request form and process. • Induction records	• Biannual inspection for weeds and vegetation condition	
Ensure waste disposal measures are implemented and prevent rubbish and litter	• Waste disposal measures undertaken, e.g. bins/ cleanups, to prevent an increase in litter impact on surrounding vegetation	RIA	• Visual inspections for rubbish, pollutants and litter	• Fortnightly	• Provide additional or larger rubbish bins, provide educative signage or conduct regular litter clean ups.

5.6. Terrestrial Fauna

The management actions proposed to minimise potential impacts on the environmental factor 'Terrestrial Fauna' are described in Table 11.

Table 11: Management actions to minimise impacts on terrestrial fauna

Environmental Factor	**Terrestrial fauna**				
Activity	Proposal Operations				
Potential Impacts	• Vehicle movement could result in injury/death to native fauna • Introduction and/or spread of weeds/disease impacting fauna habitat • Increased human presence in the vicinity has the potential to result in increased rubbish/debris/litter affecting surrounding terrestrial fauna.				
	Management Actions	Environmental Performance			
Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
No incidents of terrestrial fauna injury or death during operations	• Clearly demarcate vehicle access zones and roadways, ensuring no deviation that may have an impact on local terrestrial fauna populations. • Site speed limits are enforced to avoid or minimise vehicle strike incidents. • Vehicles are restricted to driving on designated road (i.e. Army Jetty Road). • Injured animals will be provided with first aid and handled on advice from the Wildcare Helpline (ph. 9474 9055) and RIA Rangers (ph. 9372 9788).	RIA	• Report any wildlife-vehicle collisions or other incidents involving fauna to RIA Rangers (ph. 9372 9788). • Site inspections (walk overs) to ensure vehicle access areas	• Fauna incident reporting as required. • Monthly site inspections (walk overs).	Evaluate the following measures: Install fauna barrier fencing, reduce speed limits, install fauna under/over passes or provide further staff training.

Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
			are clearly demarcated.		
Minimise risk of fauna habitat disturbance or introduction of weeds outside of the DE	• Site inductions include information regarding fauna and ecological values adjacent to the proposal, key operations that may impact on fauna and fauna management requirements. • Conduct regular site inspections (walk over) to ensure compliance with management actions outlined in the OEMP including Section 5.5.	RIA	• Induction records • Inspections as per Section 5.5.	• Monthly inductions • Monthly site inspections (walk over)	Install no/go fencing and signage to prevent pedestrian and vehicle access. Weed spraying as per Section 5.5.
Ensure waste disposal measures are implemented and prevent rubbish and litter	• Waste disposal measures undertaken, e.g. bins/ cleanups, to prevent an increase in litter impact on surrounding vegetation • Visual inspections for rubbish, pollutants and litter	RIA	• Inspection/audit records	• Fortnightly	Provide additional or larger rubbish bins, provide educative signage or conduct regular litter clean ups.

5.7. Social surroundings

The management actions proposed to minimise potential impacts on the environmental factor 'Social Surroundings' are described in Table 12.

Table 12: Management actions to minimise impacts on social surroundings

Environmental Factor	**Social surroundings**				
Activity	General Operations				
Potential Impacts	• Disturbance to existing mooring licences from increased noise, lighting, odour and dust due to operations of barges and additional traffic • Removal and relocation of vessel moorings • Potential disturbance to swimmers from increased marine traffic • Freight operations may also generate noise, odour and visual intrusions (lighting), potentially affecting the amenity of recreational users (i.e. boat users). The highest noise emissions from the current facility were associated with container set-down noise and vehicle movement.				
	Management Actions		Environmental Performance		
Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
Limit the impact on social surroundings, including noise, dust and visual intrusion (lighting) through controlled vehicle movement procedures to avoid public and community issues	• Vehicle movements will be restricted to the designated access roads to minimise dust impacts and avoidance of Marine heritage. • Vehicle speeds will be restricted to minimise the generation of dust. • Lighting must meet all safety requirements whilst minimising the impact on adjacent boat users. Lighting to be directed to the barge area and away from the marine environment. • A community complaints procedure will be implemented for the life of the proposal and the community will be notified of how to make a complaint.	RIA	• Site inspections (walk overs) to ensure vehicle access areas are clearly demarcated /appropriate signage is displayed. • Inspections also to ensure lighting is adequately being directed to the barge area away from the marine environment.	• Monthly site inspections • Annual light inspections	• Noise or dust Complaints to be recorded and handled following RIAs general complaints handling procedures (enquiries@rottnestisland.com)

Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
Limit issues related to freight operations that may cause potential negative impacts on social surroundings	• Vehicle operation will occur during prescribed hours (between 07:00 and 17:00). Noise is not to exceed *Environmental Protection (Noise) Regulations 1997*. • Freight equipment/machinery to be regularly maintained (as appropriate per specifications) to avoid noise exceedances. • A community complaints procedure will be implemented for the life of the proposal and the community will be notified of how to make a complaint. • Yearly monitoring of freight equipment / machinery to ensure regular maintenance is being undertaken as per specifications.	RIA	• Inspection of maintenance reports for freight equipment/ machinery. • Complaints register reporting as required.	• Yearly	• Noise monitoring may be undertaken if ongoing complaints are received to ensure levels are consistent with the *Environmental Protection (Noise) Regulations 1997*.
Ensure waste disposal measures are implemented and rubbish and litter is prevented to have no impact on visual amenity	• Avoid and minimise waste impacts to the surrounding area from the proposal's operations. • Ensure all waste is either recycled or moved off site to the Island disposal facility.	RIA	• Fortnightly site inspections (walk overs) to ensure no waste / litter impacts to the surrounding area.	• Fortnightly	• Consider further education to prevent litter accumulation
Ensure local amenity is protected and public safety measures are undertaken	• RIA to install floating markers/signs at the entrance to the barge landing (within development footprint) to prevent boat anchorage and swimming. • A community complaints procedure will be implemented for the life of the proposal and the community will be notified of how to make a complaint. • Site inspections (walk overs) to ensure appropriate signage is displayed to	RIA	• Visual site inspections/ photo log. • Complaints register.	• Monthly	• Complaints will be investigated within 7 days and contact made with the complainant

Management Targets	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
	prevent boat anchorage and swimming.				
Minimise impacts to mooring holders	• If required and in consultation with mooring holders, the RIA may look to further relocate moorings if impacts attributable to the proposal are experienced.	RIA	• Complaints register	• As required	• Complaints will be investigated within 7 days and contact made with the complainant
No impact to social surroundings from odour attributable to the Proposal	• Odour generated from waste compactors to be managed through short transfer intervals (removed on Tuesdays and Thursdays between 11am and 3pm). • Monitoring of Contractors waste removal records for the facility.		• Contractors waste removal records	• Weekly	• Review of Contractors waste removal methods for the facility.

6. Reporting

A summary of the reporting requirements for the Proposal are provided in Table 13.

Table 13: Compliance reporting requirements

Report	Content	Timeframe	Responsibility	Recipient
Environmental Incidents or Environmental Risks Report	Report any environmental incident or environmental risk promptly Detail the incident or risk, the measures taken, the success of those measures in addressing the incident or risk and any additional proposed to be taken Document any incidents involving the operational activities that result in injury or death to any marine species. The date, time and nature of each incident and the species involved, if known, must be recorded.	Within 12 hours or regulatory timeframes as required. Significant environmental hazards or risks and near misses to be reported within 2 days.	RIA/barge operator	RIA / DoT – Reportable Oil Spill/ Pollution Report form (POLREP) Department of Biodiversity Conservation and Attractions (DBCA) – Reportable wildlife incident RIA / DPIRD – Reportable IMP detected.
Non-compliance Summary Report	Identify which EPO has not been achieved Detail the monitoring results that identified the EPO was not being achieved Describe the investigation being undertaken into the cause of the EPO not being achieved Identify any corrective or contingency management actions proposed to be implemented or being implemented	Within 7 days of determining that an EPO has not been achieved	RIA	Department of Water and Environmental Regulation (DWER)
Non-compliance Investigation Report	Identify which EPO has not been achieved Detail the findings of the investigations undertaken into the cause of the EPO not being achieved	Within 30 days of determining that any EPO has not been achieved	RIA	DWER
Annual Operations Report	Summary of monitoring results and investigations into any EPO exceedances	Within 30 days of the final day of the reporting period	RIA	DWER

6.1. Additional Reporting

A summary of the additional reports that are expected to inform compliance reporting commitments (Table 13) are listed in Table 14.

Table 14: Additional reporting requirements required to demonstrate compliance

Topic	Content	Timeframe	Responsibility	Recipient
BCH Reporting	• Reactive BCH survey report (as required)	• Reactive survey reports as required to support potential non-compliance investigation.	RIA	DWER
Marine Environmental Quality Monitoring Program (MEQMP) Reporting	• MEQMP Summary Report.	• Monitoring summary report to be issued after each monitoring event (quarterly) and annually within the annual report.	RIA	DWER
Pollution Incidents	Reactive pollution incident report as required. Approval Holder to coordinate state reporting requirement to DoT Maritime Environmental Emergency Response (MEER) duty officer and online Pollution Report Form (POLREP)	Within 24 hours of incident	Contractor RIA	RIA DoT / RIA
Public feedback (i.e. observations, incidents and complaints)	RIA to be notified of any public feedback received in relation to the operational activities. Notification should detail the nature of the feedback and how it was resolved.	Within reasonable timeframes as required by relevant RIA operational procedures and processes.	Barge Contractor, RIA complaints manager	RIA

7. Ongoing stakeholder consultation

Stakeholders are important to any development within Western Australia, and RIA understands the stakeholders are extremely important in this process. Stakeholders will be notified of proposal developments through the Proposal website https://www.ria.wa.gov.au/projects-and-developments/significant-projects/south-thomson-barge-landing.

8. Availability of the OEMP

This OEMP will be available on the EPA website and can be provided to the public or stakeholders upon request.

9. Audit and review

RIA are committed to continual improvement and will conduct regular review of the content and implementation of this OEMP. This includes undertaking audits of barge contractors and their operations as required throughout the Proposal, to assess compliance against this OEMP. The performance of the operations against these requirements will be reported. The monitoring programs will also be reviewed, particularly frequency of monitoring after 2 years of operations once trends have been established.

This OEMP is a living document and will be reviewed in accordance with Table 15. Any significant changes must be documented in Appendix A. Changes to the document may also require approval from DWER, depending on the requirements of the Ministerial Statement.

Table 15: OEMP Review Schedule

Timing	Rationale
Upon receipt of approval conditions	If Regulator (DWER) approval conditions are provided for the proposal this will necessitate a comprehensive review of this OEMP to ensure all relevant commitments are covered within this Plan to ensure compliance.
Prior to commencement of action	To ensure that the contractor and approval holder implement all commitments accordingly and that no operational details are non-compliant. To confirm the most suitable monitoring locations, trigger levels and monitoring methods area appropriate.
Any time operational activities significantly alter	Operational changes to the proposal may result in an altered risk profile. Therefore, the OEMP will require a review to ensure that it remains fit-for-purpose for altered operational conditions. Any significant change in environmental risk may require the OEMP to be resubmitted to DWER for endorsement (this may not be required if the proposal is Not Assessed.

Timing	Rationale
Following any significant incidents or non-compliance events	To ensure that the management actions and controls in place are adequate to ensure no re-occurrence of incidents or non-compliances.

During review of the OEMP, consideration will be given, but not limited to:

- Overall effectiveness of the OEMP
- Changes in schedule
- Changes to monitoring trigger values or frequency, where determined to be ineffective or inappropriate
- Any changes in methodology or equipment used.

10. References

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Appendix A. Plan Amendments

Document Change Register

Organisation	Date	Comment	Response

Appendix B. Monitoring programs

Appendix B.1. Marine environmental quality monitoring program

This monitoring program will aid in confirming the following environmental outcomes for MEQ will be met during operations:

- No reported hydrocarbon spills or release of waste into the marine environment from operational activities. In particular, the following MTs:
  - No hydrocarbon/toxicant spills from vessels
  - No increase to human-made rubbish/debris entering the marine environment from vessels
- No reduction in marine environmental quality (water, sediment and biota) from a High Level of Ecological Protection within and adjacent to the DE as a result of the Proposal. In particular, the MT:
  - Toxicants (metals) will meet the 99% species protection limit to meet the High LEP for water quality
  - Toxicants (metals) will meet the ISQG-low for sediments.

B.1.1 Rationale

The pressures from operations of the Proposal are likely to be as follows:

- Hydrocarbon spill
- Waste spill
- Anti-fouling paint

Therefore, it is unlikely that there will be significant modifications to the water or sediment quality within the Proposal DE. In order to meet the ecological health environmental value in EPA (2016) the following toxicants (based on what is likely to be introduced to the system) are proposed to be monitored for water quality and sediments:

- Metals
- Hydrocarbons.

Suspended sediment concentration will also be tested in the water quality samples. During the sampling events, the following general observations will also be made:

- Date and time of sampling
- Person/s conducting sampling
- Site reference
- GPS coordinates of sampling location
- Tides and water depth at the time of sampling
- Wind speed (km/h) and direction
- Air temperature (℃) (recorded using a digital thermometer)
- Sea state (i.e. wave and swell heights)

- Shipping movements
- General weather conditions (rain, storm, cloud cover, etc).

Observations and scores of aesthetic water quality will also be recorded for each of the parameters as provided in Table 16. Aesthetic observations are considered to include waters within approximately 50 m radius of the survey vessel.

Table 16: Aesthetic observations parameters and scores

Parameter	REF	1	2	3	4	5
Nuisance organisms (surface cover %)	A	Nil	1-10	11-50	51-80	81-100
Large-scale deaths (marine fauna %)	B	Nil	1-10	11-50	51-80	81-100
Oil/Dust (surface coverage %)	C	Nil	1-10	11-50	51-80	81-100
Natural reflectance (diminished)	D	81-100	51-80	11-50	1-10	Nil
Seagrass/macroalgal wrack (surface coverage)	F	Nil	1-10	11-50	51-80	81-100
Objectionable odour	G	Nil	Slight	Moderate	Strong	Offensive

B.1.2 Monitoring locations

Water and sediment quality sampling will be measured at four impact sites and two reference sites. The impact sites will be located within the DE including near unloading/loading areas. The proposed monitoring locations are presented in Table 17 and Figure 7.

Table 17: Proposed coordinates of MEQ monitoring locations

	Name	Type	Easting (GDA94 MGAz50)	Northing (GDA94 MGAz50)
DE Sites	MEQ1	Within DE	363099	6458470
	MEQ2	Within DE	363110	6458519
	MEQ3	Within DE	363194	6458537
	MEQ4	Within DE	363210	6458464
Reference Sites	R1	Reference	364198	6458745
	R2	Reference	362782	6458616

Figure 7: Proposed water and sediment quality monitoring locations

B.1.3 Frequency

Baseline

As described in Section 2 of this document and RPS (2025) there have been limited water and sediment quality sampling within the Proposal area. These sampling events have shown no contamination, with results below the 99% SPL and ISQG-low for water and sediment quality respectively. However, prior to the commencement of Dredging and Construction, two quarterly sampling events should be undertaken to aid in establishing a more robust baseline. However, these will not be used to develop site-specific criteria and the criteria within EPA (2016) will be used.

Routine monitoring

The monitoring program will include quarterly water quality sampling and annual sediment quality sampling spread over an annual reporting period (Financial Year – July to June) for at least the first two years of operations. Where it is practical, sampling should be undertaken on or near to the same date each year to allow for consistent comparison of seasonal trends. An indicative sampling schedule is provided in Table 18. This routine monitoring will be undertaken for the first two years of operations, and following this the frequency will be reviewed and potentially reduced.

Table 18: Overview of sampling events to be undertaken during each annual reporting period

Sampling Event	Season	Month	Water	Sediment	Infauna
1	Winter	June-August	X		
2	Spring	September-November	X		
3	Summer	December-February	X	X	X
4	Autumn	March-May	X		

B.1.4 Water Quality Sampling and Analysis

Water Sample Collection

Water samples will be collected at all sampling locations defined within Table 17 using a depth-integrated water sampler (or similar) to pump the required volume of water evenly from the water column between 0.5 m below the surface to 0.5 m above the seabed. Suspended sediment concentration (SSC) will be collected at 0.5 m from the seafloor only.

An alternative location for sampling may be required if a sampling location is unavailable for safety reasons, such as the presence of other vessels or other operations in the DE that could influence the safety of those undertaking the sampling. If such an event occurs, then an alternative sampling location as close as safely possible should be substituted for the original sampling location.

The water sampler should be rinsed with Decon solution (or equivalent) between samples. Water samples will be collected in suitable (laboratory supplied) bottles and immediately stored on ice for transport to a National Association of Testing Authorities (NATA) accredited laboratory for analysis.

All sample containers will be marked with a unique identifier, the date/time and the sampler's name and clarification that the samples are marine water using a waterproof permanent marker. All samples should then be listed on a Chain of Custody (CoC) form and that form will be included with the samples sent to the laboratories.

Laboratory analysis

General water sample analysis will be performed on samples collected from all MEQ monitoring locations. These samples should be sent to the NATA-accredited laboratory for analysis of:

- Metals (aluminium, arsenic, cadmium, chromium (III and VI), cobalt, copper, iron, lead, lithium, manganese, mercury, nickel, silver, vanadium and zinc)
- Total recoverable hydrocarbons (TRH-silica) and Polyaromatic hydrocarbons (PAHs)
- Benzene, toluene, ethylbenzene, xylene, naphthalene (BTEXN)
- Suspended sediment concentration (SSC).

Water sampling QA/QC

Field QA/QC

The following field QA/QC samples should be collected as described below:

- One duplicate sample will be collected at the same site as one of the primary monitoring samples. A duplicate sample involves one water sample which is thoroughly mixed and then split into two sub-samples and will be done at one sampling location. The purpose of the sample is to confirm that the primary laboratory is able to produce consistent results when analysing the same sample. The site where it was taken is to be recorded but not reported to the laboratory. Ideally, it should be collected at a site that is expected to have higher levels of contamination (based on the historic data and potential sources of contamination) as this will confirm a wider range of analytes and reduce the level of instrument error when comparing larger concentrations
- One rinsate sample is collected to confirm that cross-contamination hasn't occurred during the sampling processes in the field. The rinsate sample should be taken after the decontamination process of the sample collection equipment by running deionised water over the equipment and collecting it in laboratory provided bottles.

Field QA/QC sampling is not required for SSC.

Laboratory QA/QC

Comprehensive QA/QC testing of water samples will be undertaken in accordance with NATA accreditation and include testing of laboratory control samples, method blanks, matrix spikes, laboratory duplicates and surrogate recovery outliers (where applicable).

B.1.5 Sediment Quality Sampling and Analysis

Sediment Sample Collection

Sediment samples should be collected at all sampling locations defined within Table 17. Sediment samples should be collected using a 'van Veen' grab or equivalent. Field observations and digital photographs will be collected for each sample prior to placing the sample into jars/containers. All

equipment that comes into contact with the sample should be rinsed with Decon solution and seawater prior to sampling each site to reduce the potential for contamination. Containers should be refrigerated or placed into an esky with ice bricks before being frozen on return from the field and sent to the NATA accredited laboratory. All sample containers should be marked with a unique identifier, the date/time and the sampler's name and clarification that the samples are marine water using a permanent marker. All samples should then be listed on a CoC form to be included with the samples sent to the laboratories.

If insufficient sediment is collected at a sampling site, additional replicates will be required to ensure sufficient volume. Where refusal is encountered, best endeavours should be made to collect a sample, though continued refusal when attempting to collect a sample should warrant no further sampling at that sampling location. The team implementing the sampling should seek to find an alternative location as close to the sampling location as possible where a sample can be taken and sufficient details recorded of the new location.

An alternative location for sampling may also be required if a sampling location is unavailable for safety reasons, such as the presence of other vessels or other operations at the Port that could influence the safety of those undertaking the sampling. If such an event occurs, then an alternative sampling location as close as safely possible should be substituted for the original sampling location.

Laboratory analysis

Sediment samples collected from the monitoring locations should be sent to the NATA accredited laboratory for analysis of:

- Metals (aluminium, antimony, arsenic, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, nickel, silver, vanadium, zinc)
- Tributyltin (TBT)
- TRH-Silica
- PAHs
- TPH
- Total organic carbon (TOCs)
- Particle size distribution.

Testing for bioavailability or elutriates will not be required unless significant toxicant concentrations are identified. Any bioavailability/elutriate testing would be in consultation with RIA. If an EQG for a toxicant in sediments is exceeded, the following additional laboratory testing will be conducted specifically for that toxicant which exceeded:

- Bioavailability testing
- Elutriate testing.

The results from bioavailability and elutriate testing will be compared to the EQG's present in Table 20 and Table 19, respectively.

Sediment sampling QA/QC

Field QA/QC

Disposable nitrile gloves should be used during handling of the sediment sample and all equipment in contact with the sediment should be washed down with Decon solution prior to each sample being taken. The following QA/QC samples should be collected:

- Two triplicate sample should be collected at two sites to determine the variability of the sediment physical and chemical characteristics. A triplicate sample involves three separate samples collected from the same location and treated as separate samples for the purpose of laboratory analysis and data analysis.
- A duplicate sample involves one sediment sample which is thoroughly mixed and then split into two sub-samples and will be done at one sampling location. The purpose of the sample is to confirm that the primary laboratory is reporting consistent results when analysing the same sample. One sub-sample will be sent to the primary laboratory, and the second will go to a secondary laboratory. The site where it was taken is to be recorded but not reported to the laboratories. Ideally it should be collected at a site that is expected to have higher levels of contamination (based on historic data and potential sources of contamination) as this will confirm a wider range of analytes and reduce the level of instrument error when comparing larger concentrations.
- A transport blank (acid-washed silica sand) in a sealed jar should be provided by the laboratory and taken to site but not opened. The transport blank is sent back to the laboratory with the other samples and analysed. This blank is used to assess if any hydrocarbon cross contamination occurs during transport and handling.

Laboratory QA/QC

Laboratories used for sediment sample analysis must be NATA accredited. Comprehensive QA/QC testing of sediment samples should be undertaken in accordance with NATA accreditation and include testing of laboratory control samples, method blanks, matrix spikes, laboratory duplicates and surrogate recovery outliers (where applicable).

B.1.6 Benthic Infauna

Benthic Infauna Sample Collection

At each sample location (as defined within Table 17), three replicate benthic infauna samples are to be collected. Samples should be collected similarly to sediment samples using a suitable sediment sampler outlined above. Once samples are collected on deck a subsample of a known volume will be immediately collected from the grab for further processing. Subsampling a known volume will ensure consistency between sites when presenting and analysing benthic infauna data.

Once subsampled, the sediment is removed via sieving through an appropriate size mesh for the sediment type (500-1000 µm mesh stainless steel) to remove any benthic invertebrates for later identification. The benthic invertebrate samples require preserving with a mixture of approximately 90% ethanol and 10% water solution, placed in pre-labelled containers and stored for transport to a suitable laboratory for analysis.

Benthic infauna sampling will be undertaken yearly.

Laboratory and Data Analysis

Laboratory picking is conducted under a dissecting-microscope, with all benthic infauna being removed from any remaining sediment. Macroinvertebrates should be identified to Family taxonomic level using a compound microscope.

The assessing laboratory should be contacted prior to sampling to ensure suitable statistical methods are conducted for ongoing assessment. Suitable mathematical measures of species diversity and richness may include:

- Margalef's index (d), selected to assess the species richness
- Shannon's index (H), selected to assess the species diversity
- Evenness index (EH), selected to assess evenness within samples
- Dominance (D), selected to assess taxon dominance within samples.

B.1.7 Environmental quality guidelines

Toxicants in Water

The EQG for toxicants in water are based on Species Protection Levels (SPLs) that represent the concentration below which a given percentage of the species are expected to be protected (i.e. 99% SPL protects 99% of species). The SPLs are generally derived from laboratory tests on a range of species and taxa and are presented in ANZG (2018). For this Proposal, those for the High LEP are relevant within the Proposal area.

The interim EQGs for the contaminants of key concern are presented in Table 19.

Table 19: Interim Environmental Quality Guidelines for toxicants in water for protection of the EV '*Ecosystem Health*'

Environmental Quality Guidelines	Units	High LEP
Aluminium	µg/L	No EQG Apply
Arsenic (III/V)	µg/L	No EQG Apply
Cadmium	µg/L	0.7
Chromium III	(µg/L)	7.7
Chromium VI	(µg/L)	0.14
Cobalt[1]	µg/L	1.0
Copper	µg/L	0.3
Lead	µg/L	2.2
Lithium	µg/L	No EQG Apply
Manganese	µg/L	No EQG Apply
Mercury	µg/L	0.1
Nickel	µg/L	7

Environmental Quality Guidelines	Units	High LEP
Silver	µg/L	0.8
Vanadium	µg/L	50
Zinc	µg/L	3.3
TRH-Silica / PAHs	µg/L	No EQG Apply
BTEXN • Benzene • Toluene • Ethylbenzene • Xylene[2] • Naphthalene	µg/L	Separate EQGs for each • 500 • 110 • 50 • 50 • 50

Source: ANZG (2018)

[1] 95% SPL applied for cobalt in accordance with EPA (2016)

[2] Xylene based upon m-Xylene from ANZG (2018)

Toxicants in Sediment

Interim EQG for toxicants in sediment are based on the ANZG (2018) Default Guideline Values for the EV '*Ecosystem Health*' where available (Table 20). Where unavailable, site specific EQGs may be calculated at the completion of the baseline data collection period in accordance with EPA (2016) and ANZG (2018) but in the interim will be compared to the reference site data.

Table 20: Interim Environmental Quality Guidelines for toxicants in sediment

EQG	Units	High LEP
Aluminium	mg/kg	No EQG Apply
Antimony	mg/kg	2
Arsenic	mg/kg	20
Cadmium	mg/kg	1.5
Chromium	mg/kg	80
Copper	mg/kg	65
Iron	mg/kg	No EQG Apply
Lead	mg/kg	50
Lithium	mg/kg	No EQG Apply
Manganese	mg/kg	No EQG Apply
Mercury	mg/kg	0.15
Nickel	mg/kg	21
Silver	mg/kg	1

EQG	Units	High LEP
Vanadium	mg/kg	No EQG Apply
Zinc	mg/kg	200
TRH-Silica	mg/kg	No EQG Apply
Total PAHs	µg/kg 1%TOC	10,000
TBT	µg/kg 1%TOC	9.0
TPH	mg/kg	280

Source: ANZG 2018

B.1.8 Management actions

If the EQGs prescribed above in Section B.1.7 are exceeded at any of the sites, further management actions will be undertaken. Initially, results will be confirmed through checking sampling and laboratory methods were correctly conducted, and following this additional sampling will be undertaken as soon as possible at the site to check if this exceedance needs to be investigated. If an exceedance at the same site is reported in the second sampling event, a reactive BCH survey will be undertaken in accordance with the methods presented in Appendix B.2, along with an investigation into operational activities and the management in place. Operations may be paused, and further management to be investigated until sampling shows the EQGs are being met.

Should EQG be exceeded consistently over the first two years of routine monitoring, following application of management actions, then engagement with DWER will be undertaken to investigate whether a defined Moderate LEP may need to be applied to the Proposal.

A summary of this process is presented in the tiered management framework (TMF) in Figure 8.

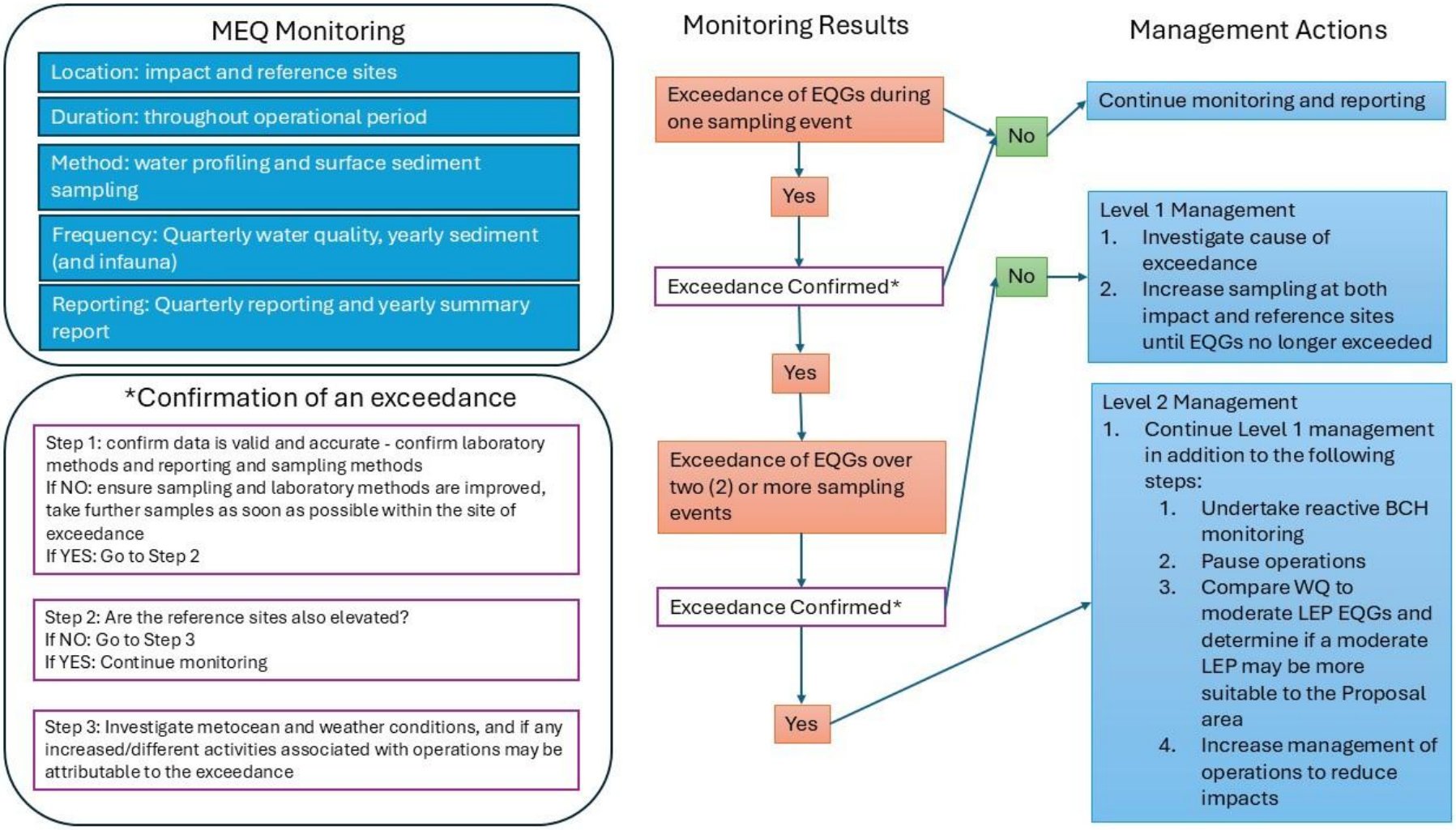

Figure 8: Tiered management framework for MEQ monitoring for Proposal operational activities

B.1.9 Reporting

A compliance report will be prepared following the completion of each sampling event and a summary compliance report to be prepared annually.

Appendix B.2. Benthic communities & habitat monitoring program

B.2.1. Rationale

Seagrass communities are the most vulnerable (of those BCH present in the impact area) to the effects of increased turbidity (measured as SSC) and the associated decline in benthic light availability and potentially in increase in toxicants within the water or sediment. Therefore, seagrass health will be lead indicator for monitoring of benthic community health if MEQ MTs are not being achieved. Seagrass and macroalgae will both be monitored if there is an exceedance in MEQ MTs and an investigation into ecosystem health is required. The BCH sites are the same as those used for monitoring impacts due to dredging, though a smaller number of locations will be required for ongoing monitoring during operations.

Diver based transects will be used to collect data from each site, which will be analysed to determine percent cover, species dominance, and other health parameters (See B.2.4). 10 quadrats at three 50 m transects will be surveyed, with images of the 0.2 x 0.2 m quadrats taken. Additional qualitative observations will also be recorded such as evidence of dead rhizome mat, or presence of invasive marine species.

B.2.2. Locations

Indicative monitoring locations will be selected in areas of at least moderate BCH cover and include:

- Three impact locations within the vicinity of the DE, two of which were within the ZoMI of the dredge plume, and one which was within the temporary mooring area for construction vessels.
- Two reference sites

The proposed coordinates and locations are given in Table 21 and Figure 9.

Table 21: Proposed coordinates of MEQ monitoring locations

	Name	Type	Easting (GDA94 MGAz50)	Northing (GDA94 MGAz50)
DE Sites	BCH1	Near operations	363275	6458424
	BCH2	Near operations	363172	6458583
	M1	Near operations, previous mooring area	363143	6458417
Reference Sites	R1	Reference	364198	6458745
	R2	Reference	362782	6458616

Figure 9: Proposed BCH quality monitoring locations for operations

B.2.3. Frequency

Baseline surveys

BCH surveys to establish baseline conditions will have been undertaken within one month prior to the commencement of dredging. Reactive (during marine construction) and post-construction monitoring will continue as per the DEMMP (O2 Marine 2025). Rottnest Island currently also has an existing annual seagrass monitoring program with 10 sites around the island, and the sites for this Proposal will be monitored at the same time as the existing sites. This usually occurs between January and February of each year, including 2025 and 2026.

Reactive surveys during operations (as required)

As these sites are also being used for monitoring impacts associated with marine construction activities, monitoring for the marine construction aspect will be completed when BCH has completely recovered from the dredging and construction (within 5 years). Following this time, reactive monitoring will continue as a response to MEQ trigger exceedances and monitor the ecological effects of operations. This will only be undertaken if MEQ EPQs described in Section B.1.7 are exceeded over two sampling periods.

B.2.4. Survey Methods

Reactive BCH monitoring for community health will involve implementation of a standard diver-based survey of before / after / control / impact (BACI) design. This includes using baseline information to compare to the reactive surveys, and impact sites compared to reference sites.

Methods of monitoring the additional sites for this Proposal have been based on the existing methods for the annual program. At each monitoring site, three x 20 m transects will be laid out with tape measures from the centre, and marked at 0^0, 120^0 and 240^0. Quadrats of 0.2 m by 0.2 m will then be placed on the right-hand side of the tape measures and within 1 m of the tape. Seven quadrats along each transect will be laid and three additional placed randomly adjacent to each transect. In total, there will be 10 quadrats per transect, giving 30 quadrats per site.

Divers will capture still images of each quadrat at the site using an underwater camera, approximately 1 m above the canopy. Data collected by the divers at each of the quadrats will include:

- Date
- Diver details
- Site Name
- Weather/water conditions
- Transect Bearing
- Quadrat Number
- Depth (m)
- Species
- No. Shoots/stems
- Max Leaf Height (mm)

- Avg Leaf Height (mm)
- Species dominance
- Estimate of visibility
- Any additional comments including presence of dead organisms.

B.2.5. Data Analysis

The percentage of benthic species cover that directly intercept the tape measure length of each 20 m transect using the line-intercept method will be calculated into a proportion of each benthic group (i.e., 20 m equals 100%). The benthic groups used will be calculated manually in excel to determine the relative abundance, mean, standard deviation, standard error and the Shannon-Weaver diversity Index of each benthic cover type at each site.

Multiple lines of evidence

In the event that management criteria are exceeded, a series of investigations and statistical analyses will be initiated in a structured decision-making framework to rigorously assess whether the detected change at an affected reef was due to dredging or simply the result of natural change.

The first step will be an assessment of the magnitude of change (effect size and its confidence interval) in cover between the impact and reference locations, from before dredging to the current survey period.

Multiple lines of evidence, based on causal indicators, are used to assess the impact hypothesis and may apply a variety of univariate or multivariate analysis. With lines of evidence there is a need to seek evidence not only to support the impact prediction, but evidence to rule out plausible alternative predictions, such as that the observed difference was due to natural processes including thermal bleaching from warm water temperatures, natural mortality, predation, cyclonic events or salinity change. Potential natural and anthropogenic causes of impacts will be monitored and noted during routine surveys as part of the MEQ monitoring, and in some cases during the reactive monitoring program. A reactive monitoring program will be activated when there is a potential for a decline in BCH occurring (i.e. MEQ EGQ exceedance over at least two sampling events).

A number of factors are relevant to the likelihood and level of severity of an impact occurring, including existing stress levels, age, size and health status of organisms, associated biota and adaptations to localised conditions. Differences in the physical characteristics between reference and impact locations and how this could affect the scale of effect observed should also be considered. The data will be compiled to provide a weight of evidence to determine if operational activities were reasonably considered to cause or contribute to the impact.

If impacts are measured and confirmed to be attributable to operational activities, further monitoring will be undertaken with a higher frequency i.e. quarterly to gain seasonal information about variations. In the meantime, management actions will be undertaken including investigations into spills, barge operations and transiting methods to minimise further impacts.

B.2.6. BCH quality thresholds

In order to determine if there is an impact to BCH, the following threshold should be considered for assessment:

- No significant difference in the changes in seagrass or macroalgae health and abundance at the impact sites in comparison to the reference sites over time.

This will be calculated through statistical assessment of impact and reference data over time compared to the baseline survey results.

B.2.7 Management actions

In the event of BCH impacts being confirmed through the reactive BCH surveys, further management may also be required. As described in Section B.1.8, an exceedance of MEQ EQGs will result in management actions for operations, including pausing operations or looking at increasing management of certain activities. If BCH is reported to be decreasing (there is a significant change in BCH health as determined through statistical assessment), marine fauna surveys may be undertaken to determine if habitat loss is also resulting in marine fauna impacts.

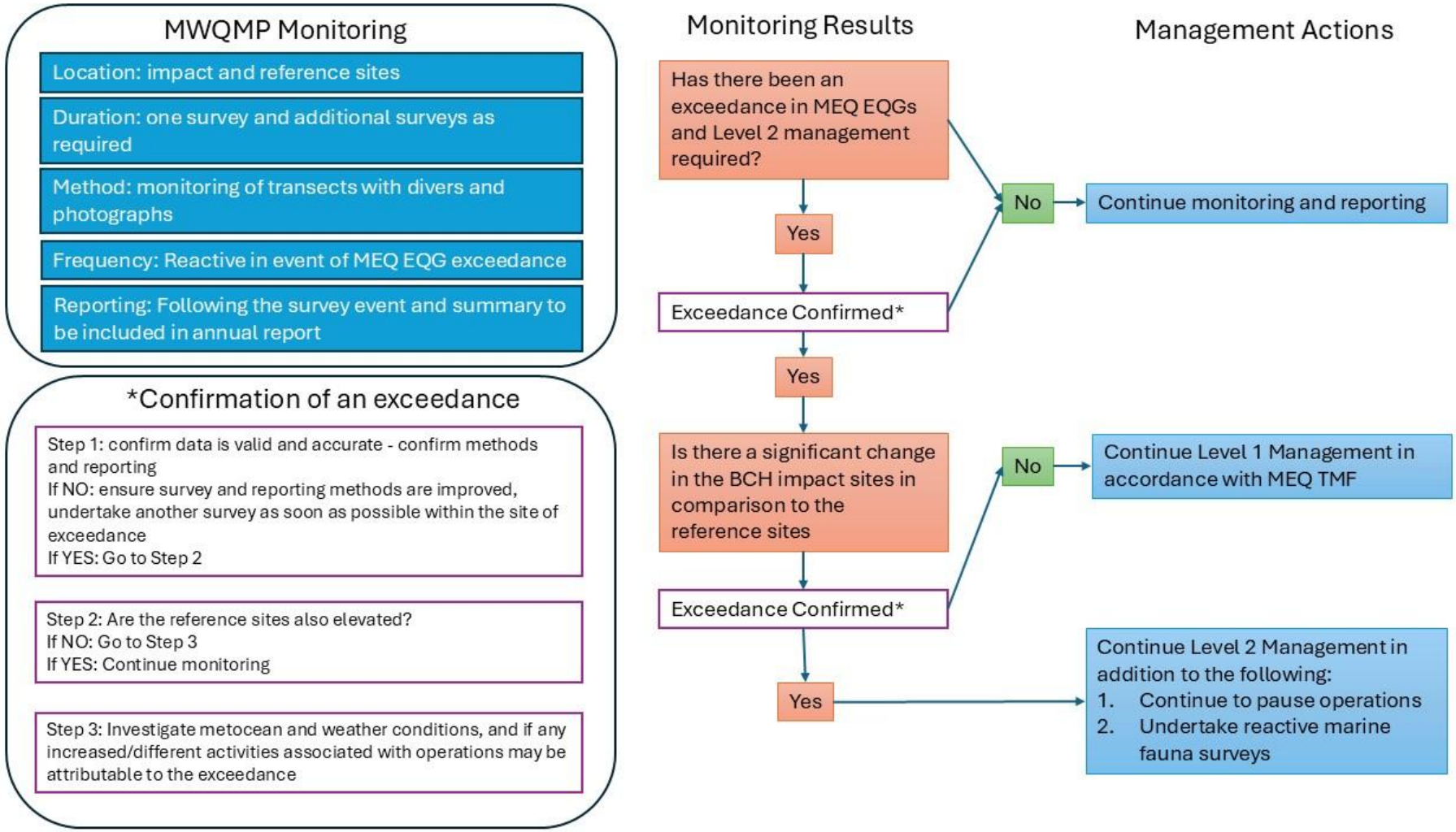

Figure 10: Tiered management framework for BCH exceedance

B.2.8. Reporting

In the event that a reactive survey investigation may be warranted, a reactive survey report will include:

1. A summary of data collected during the survey
2. Comparison of BCH condition with baseline and against reference locations
3. Multiple lines of evidence assessment
4. Evaluation of whether EPOs have been achieved or not
5. Recommendations for additional investigations / management / monitoring if required.

Reactive survey reports should be reviewed together with any required compliance investigation reports for recommendations of the next steps for operations.

This report should also be included within the annual compliance report prepared by RIA for the Proposal.

Appendix B.3. Seagrass wrack and sedimentation monitoring program

B.3.1. Rationale

This monitoring program has been developed to confirm if the following MTs are being achieved:

- No persistent accumulations of shoreline seagrass wrack beyond natural levels
- No persistent accumulations of sediment beyond natural levels
- No social amenity reports (including odour) from the general public
- No reports of navigational impacts due to wrack accumulation

This monitoring program aims to track the accumulation of wrack within and adjacent to the DE, including the following methods:

- Visual monitoring including site visit and photographic monitoring of the wrack and sedimentation immediately within and surrounding the DE to be undertaken fortnightly
- Navigation monitoring to be undertaken using multibeam surveys each year for the first 3 years, and then every 2 years following this as trends are established (frequency to be reviewed after 5 years following the commencement of operations).

This monitoring will be in addition to the MEQ monitoring being undertaken as described in Appendix B.1.

B.3.2. Visual seagrass wrack and trapped sediment monitoring

As part of the MEQ monitoring program described in Appendix B.1, visual seagrass wrack monitoring is done quarterly at the monitoring sites. In addition to this, ongoing monitoring will be undertaken regularly of seagrass wrack and sediment to determine the accumulations and whether there is an increase above natural levels for the season. Recommendations from Baird (2025) included focusing on the eastern side of the Proposal for build-up of wrack and sediment, and therefore visual monitoring will focus on this area.

Regular (fortnightly) inspections within the Proposal DE will be undertaken and documented with photographs to show location and extent.

Seagrass wrack is expected to be higher over the summer months, peaking in March before being cleared through autumn and early winter due to local wave conditions (Baird 2025). Therefore, monitoring may need to be increased to weekly during March and through to early winter (i.e. June) to determine if seagrass wrack needs to be cleared if the volume is too large, or if the accumulation is not dispersing naturally in May/June. This will be determined by RIA each season.

The rest of South Thomson Bay will be visually monitored using aerial photographs using unmanned aerial vehicles (UAV) in April and September to determine the trends and if there is accumulation in other areas of the Bay attributable to the Proposal.

This photo monitoring will also be used to inform potential management of trapped sediment material (such as sand by-passing) to monitor the accumulation on the east-side shoreline in accordance with the recommendations within the Coastal Hazard Risk Management and Adaption Plan (CHRMAP; Baird 2025). Changes in the volume of trapped sediment material as a result of the Proposal is considered unlikely (Baird 2025).

B.3.3. Navigation monitoring

Wrack accumulation within the Barge Landing operational area may have impacts for the functionality of the area due to depths becoming too shallow. Therefore, multibeam surveys will be undertaken to determine the bathymetry of the area including the surface of the wrack layer. This will also be undertaken on the eastern side of the wharf.

B.3.4. Management actions

In the event of a non -compliance of an MT, management actions will be based on the following adaptive management strategy framework:

- Investigate whether non-compliance of the MT is due to the Proposal (compare to aerial photographs prior to development)
    - Carry out additional wrack/sedimentation monitoring if further information is required to evaluate whether the future proposal is the cause of the exceedance
- If it is likely that the exceedance is due to the Proposal, management actions in accordance with the CHRMAP (Baird 2025) will be considered:
    - In the case of a seagrass wrack MT being non-compliant, removal and relocation of wrack along on the shoreline (part of general waste clearing operations, with a small excavator or a long-reach excavator from the road on top of the breakwater)
    - In the case of a seagrass wrack MT being non-compliant, removal and relocation deposited wrack on the seabed within the deeper dredged area within the Proposal DE (this may need to be by dredge as part of maintenance dredging operations).
    - In the case of a sedimentation MT being non-compliant, removal and relocation of sediment onto shorelines east of Thomson Bay between Army Groyne and Philip Point to mimic natural processes.

Any removal and relocation would need to be undertaken by licenced contractors with the relevant licences for removal.

B.3.5. Reporting

Reporting of seagrass wrack and sedimentation monitoring and any removal required will be included within the annual report for operations with the summary of the MEQ monitoring and any reactive BCH monitoring.

Appendix B.4. Marine fauna monitoring program

B.4.1. Marine fauna monitoring to avoid vessel strike

To mitigate vessel traffic negatively impacting marine fauna by vessel strike will be minimised by vessels in the area adhering to the vessel speed restrictions in the area (5 knots). Vessels will adhere to vessel approach distance following EPBC Regulations 2000 – Part 8 Division 8.1: National Guidelines for Whale and Dolphin Watching (Commonwealth of Australia 2017) and the WA BC Act. No approach zones are zones of total vessel exclusion. Caution zones cannot be entered by a vessel if there is an animal that is injured, stranded, entangled or distressed, or if a single calf or pod of calves are present. Should a travelling dolphin enter the no approach zone, including with an attempt to 'bow ride', the vessel shall either maintain its course and speed, or maintain its course and gradually slow down.

These distances are presented below in Table B4-1. These distances will be monitored during transit and enforced by the vessel master and/or trained crew (marine fauna observer (MFO)). Trained crew are person trained in marine fauna species observations and mitigation measures, in line with the Proposals environmental management plans. At least one trained MFO will be on duty on Proposal vessels during transit within the Rottnest Island Marine Reserve waters but will not be given other tasks while on duty.

Table 41: Marine fauna - vessel approach distances (DoEE 2017)

Marine fauna group	Caution zone	No approach zone (metres)	Distress/disturbance
Adult whales	300	• 100 m to the side of the whale • 300 m in front or to rear of the whale	Withdraw from caution zone at speed less than 6 knots
Whale calf* present	-	300 m	Withdraw from No approach zone at speed less than 6 knots
Adult dolphins	150	• 50 m to the side of the dolphin • 150 m in front or to rear of the dolphin with the exception of animals bow-riding	Withdraw from caution zone at speed less than 6 knots
Dolphin calf* present	-	150 m	Withdraw from No approach zone at speed less than 6 knots
Sea lion	300 m	100 m	Withdrawn from No approach zone at a speed less than 6 knots
*A calf is defined as half the length of the mother/nearest adult			

B.4.2. Marine fauna incident reporting

If injured or deceased marine fauna are sighted or introduce marine pest is identified the reporting requirements for specific marine fauna incidents are listed below in Table B4-2. Injury to conservation significant fauna or listed species as a result of the Proposal operational activities, or general observations of injured wildlife not related to the Proposal, are to be reported immediately by the RIA

or if identified by Barge Operators or other persons involved in the Proposal must be immediately reported to RIA.

Table B4-2: Reporting requirements and contact details for injured marine fauna

Wildlife	Content	Timeframe	Responsibility	Recipient
Sick or injured wildlife; snake removal	• Location including GPS coordinate • Within or outside of work area • Time of observation • State/condition of individual/s • Affected species • Image (if possible).	Within 24 hours as being notified (as soon as possible)	RIA	WILDCARE Helpline (24 hr) (08) 9474 9055
Fish deaths	• Location including GPS coordinate of fish kill • Estimated number of dead fish • Species affected • Photograph.	Within 24 hours as being notified (as soon as possible)	RIA	Fish Watch (24 hr hotline) 1800 815 507
Animal or plant deaths obviously caused by pollution	• Location including GPS coordinate • Within or outside of work area • Time of observation • Cause of pollution • Condition of species and estimated number	Within 24 hours as being notified (as soon as possible)	RIA	DWER (24 hr Pollution Watch Hotline) 1300 784 784
Possible IMP	• Location (GPS coordinate, or nearest landmark) and water depth • Date and time of detection • Size and colour of IMP • Environment (i.e. beach, sand, rock pool, in weed, water, attached to structure) • Photo	Within 24 hours as being notified (as soon as possible)	RIA	FishWatch on 1800 815 507 Email: aquatic.biosecurity@dprid.wa.gov.au Local DPIRD office

B.4.3. Reactive marine fauna monitoring

If MEQ and BCH outcomes are not being achieved, it is likely this may also have impacts on marine fauna within and surrounding the Proposal area. Therefore, a marine fauna survey may also need to be undertaken. The reactive marine fauna monitoring will be developed consistent with RIA's Rottnest Island Marine Conservation Action Plan 2022-2032.

Monitoring will occur at the sites where the EQGs are being exceeded. The trends for the key ecological attributes will be monitored at these sites as outlined in Table B3-1 and will be compared to the trends observed monitoring sites as described in RIAs Rottnest Island Marine Conservation Action Plan 2022-2032 to determine if this decreasing trend is attributable to the Proposal.

Table B3-1: Recreative marine fauna monitoring indicators and triggers

RIA conservation targets	Key ecological attribute	Indicator	Trigger
Seagrass community	Fish, sharks and rays diversity, abundance and size structure	Species diversity, abundance and size structure	Decreasing trend
	Fish recruitment	Species diversity and abundance	Decreasing trend
Subtidal reef community	Fish, sharks and rays diversity, abundance and size structure	Species diversity, abundance and size structure	Decreasing trend
	Fish recruitment	Species diversity and abundance	Decreasing trend
Water column	Mobile fish diversity and size structure, including sharks and rays	Species composition and size structure	Decreasing trend