ENVIRONMENT
An O2Marine company

Marine Fauna Management Plan

Ashburton Salt Project

MARINE

CLIENT: K+S Salt Australia Pty Ltd

STATUS: Rev 0

REPORT NUMBER: R220026

ISSUE DATE: 18 November 2022

WA MARINE PTY LTD | ABN 84 168 014 819 | www.o2marine.com.au

Important Note

This report has been prepared for the sole use of K+S Salt Australia Pty Ltd (herein, 'the client'), for a specific site (herein 'the site', the specific purpose specified in Section 1 of this report (herein 'the purpose'). This report is strictly limited for use by the client, to the purpose and site and may not be used for any other purposes.

Third parties, excluding regulatory agencies assessing an application in relation to the purpose, may not rely on this report. O2 Marine waive all liability to any third-party loss, damage, liability or claim arising out of or incidental to a third-party publishing, using or relying on the facts, content, opinions or subject matter contained in this report.

O2 Marine waive all responsibility for loss or damage where the accuracy and effectiveness of information provided by the client or other third parties were inaccurate or not up to date and was relied upon, wholly or in part in reporting.

Maps are created in WGS 84 - Pseudo-Mercator (EPSG:3857) coordinate reference system and are not to be used for navigational purposes. Positional accuracy should be considered as approximate.

WA Marine Pty Ltd t/as O2 Marine
ACN 168 014 819
Originating Office – Western Australia
11 Mews Road FREMANTLE WA 6160
T 1300 219 801 | info@o2marine.com.au

Version Register

Version	Status	Author	Reviewer	Comments	Authorised for Release (signed and dated)
Rev A	Draft	E Evans	D Hanf	Internal review	
Rev B	Draft	E Evans	G Motherwell	Final internal review	
Rev C	Draft	E Evans	G Edwards	Client review	G Motherwell 16/11/22
Rev 0	Final	E Evans	D Hanf	Final document for issue	D Hanf 18/11/22

Transmission Register

Controlled copies of this document are issued to the persons/companies listed below. Any copy of this report held by persons not listed in this register is deemed uncontrolled. Updated versions of this report if issued will be released to all parties listed below via the email address listed.

Name	Email Address
Gerrit Goedecke	Gerrit.goedecke@k-plus-s.com

Acronyms & Abbreviations

Acronym/Abbreviation	Description
BC Act	*Biodiversity Conservation Act 2016*
BIA	Biologically Important Area
CEMP	Construction Environmental Management Plan
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
Dedicated Marine Fauna Observer	A dedicated person engaged to undertake marine fauna observations and implement mitigation measures prior to and throughout the piling operations. The dedicated MFO will be suitably trained and qualified, adhering to the requirements of the Wildlife Conservation (Closed Season Marine Mammals) Notice 1998.
DoT	Department of Transport
DPIRD	Department of Primary Industries and Regional Development
DSMP	Dredging and Sediment Management Plan
DWER	Department of Water and Environment Regulation
EIA	Environmental Impact Assessment
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPO	Environmental Protection Outcome
GL	Gigalitre
ha	Hectares
IMPMMP	Introduced Marine Pest Monitoring and Management Plan
IUCN	International Union for Conservation of Nature
km	Kilometre
kn	Knots
K+S	K plus S Salt Australia Pty Ltd
LMP	Light Management Plan
m	Metre
m^3	Cubic metre
mm	Millimetre
m/s	Metres per second

Acronym/Abbreviation	Description
MFMP	Marine Fauna Management Plan
MFO	Marine Fauna Observer
MNES	Matters of National Environmental Significance
MT	Management Target
Mtpa	Million tons per annum
nm	Nautical miles
OPMF	Onslow Prawn Managed Fishery
POLREP	Pollution Report
PTS	Permanent Threshold Shift
The Project	Ashburton Salt Project
Trained Marine Fauna Observer	A crew member trained in marine fauna species observations and mitigation measures, consistent with Project environment management plans. The trained MFO will be on duty on Project vessels during vessels operations and may have other vessel duties.
TTS	Temporary Threshold Shift
SoA	Shire of Ashburton
WA	Western Australia

Contents

Figures

Tables

1. Introduction

1.1. Project Summary

K plus S Salt Australia Pty Ltd (K+S) proposes to develop and operate a greenfield Solar Salt Project (the proposed Ashburton Salt Project) on the Western Australian (WA) coast, approximately 40 kilometres (km) south-west of the townships of Onslow, within the Shire of Ashburton (SoA) (Figure 1). The Ashburton Salt Project (the Project) will produce up to 4.7 million tonnes per annum (mtpa) of salt through solar salt farming, a process involving the evaporation of sea water using sunlight and wind.

The Project includes the construction of the solar evaporation and crystallisation ponds and associated infrastructure including:

- a seawater intake (comprising an intake sump, pipelines, pumps and channel)
- concentration and crystallisation ponds
- salt wash plant
- stockpiles and conveyors
- bitterns discharge infrastructure (including a dilution pond, pipeline and diffuser)
- jetty and product loading infrastructure
- access road, internal site roads and haul roads (for construction materials and, during operations for site maintenance and product transfer)
- borrow pits for extraction of clay and other construction materials
- drainage diversions
- dredging and onshore placement of dredged material
- buildings such as offices, storage and workshops
- sewage treatment
- water monitoring bores
- small desalination plant
- service corridors
- electricity and natural gas distribution
- equipment parking and laydown areas
- fuel storage and a refuelling station
- helipad.

The Department of Climate Change, Energy, the Environment and Water (DCCEEW) has determined that this Project is a controlled action under the EPBC Act. In early 2017 it was determined that the Project will be assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) by the WA Environmental Protection Authority (EPA) as an accredited assessment. The Project was referred to the WA EPA in October 2016, where it received an assessment level of Public Environmental Review under Part IV, Section 38 of the *Environmental Protection Act 1986* (EP Act). Marine fauna was identified as a key environmental factor to be addressed in the impact assessment and management of the Project. For the

purposes of Environmental Impact Assessment (EIA), marine fauna is defined as, "Animals that live in the ocean or rely on the ocean for all or part of their lives." (EPA 2016).

The proposed Project layout is shown in Figure 2. The summary Project description is detailed in Table 1, with key physical and operational elements of the Project identified in Table 2.

Table 1 Short summary of the Project

Project Title	Ashburton Salt Project
Proponent Name	K plus S Salt Australia Pty Ltd
Short Description	It is proposed to construct and operate a solar salt Project approximately 40 km southwest of Onslow, WA. The Project includes the construction of solar salt evaporation and crystallisation ponds and associated infrastructure/activities (seawater intake pumps / channel / pipeline(s); seawater concentration ponds and salt crystallisation ponds; internal site roads; electricity generation and reticulation; fuel storage sites; a jetty and product loading facilities; a salt wash plant and associated ponds; salt stockpiles and conveyors; onsite buildings such as offices, storage, workshops and possibly accommodation; sewage treatment facilities and landfill; water management/monitoring bore(s); helipad; desalination plant; equipment parking and laydown areas; bitterns discharge infrastructure which includes a channel, dilution pond, pipeline and diffuser; drainage diversion/s and levees; access roads; borrow pit areas for rock, clay and other construction materials; and dredging and land based dredge spoil disposal).

Table 2 Location and proposed extent of physical and operational elements

Element	Location	Proposed Extent
Physical Elements		
Evaporation and crystallisation ponds	Figure 2	Disturbance footprint of no more than 10,397 hectares (ha) within a 20,990 ha Development Envelope
Support infrastructure	Figure 2	Disturbance footprint of no more than 1,596 ha within a 20,990 ha Development Envelope (includes: seawater intake pumps/channel/pipeline(s); internal site roads; electricity generation and reticulation; fuel storage sites; a jetty and product loading facilities; dredging; land based dredge spoil disposal; a salt wash plant and associated ponds; salt stockpiles and conveyors; onsite buildings such as offices, storage, workshops and accommodation; sewage treatment facilities; landfill; water management/monitoring bore(s); equipment parking and laydown areas; bitterns discharge infrastructure which includes a channel, dilution pond, pipeline and diffuser; drainage diversion(s) and levees; borrow pits; helipad; and desalination plant.)
Access roads (including road upgrades and river crossing/bridge	Figure 2	Clearing of no more than 155 ha within a 20,990 ha Development Envelope (77 ha for main access road and 78 ha for internal site access roads)
Operational Elements		
Seawater intake	Figure 2	Seawater intake of no more than 250 gigalitre (GL) per annum
Wastewater (bitterns)	Figure 2	Marine discharge of no more than 20 GL per annum (consists of no more than 10 GL per annum bitterns, diluted with seawater at a ratio of approximately 1 to 1)

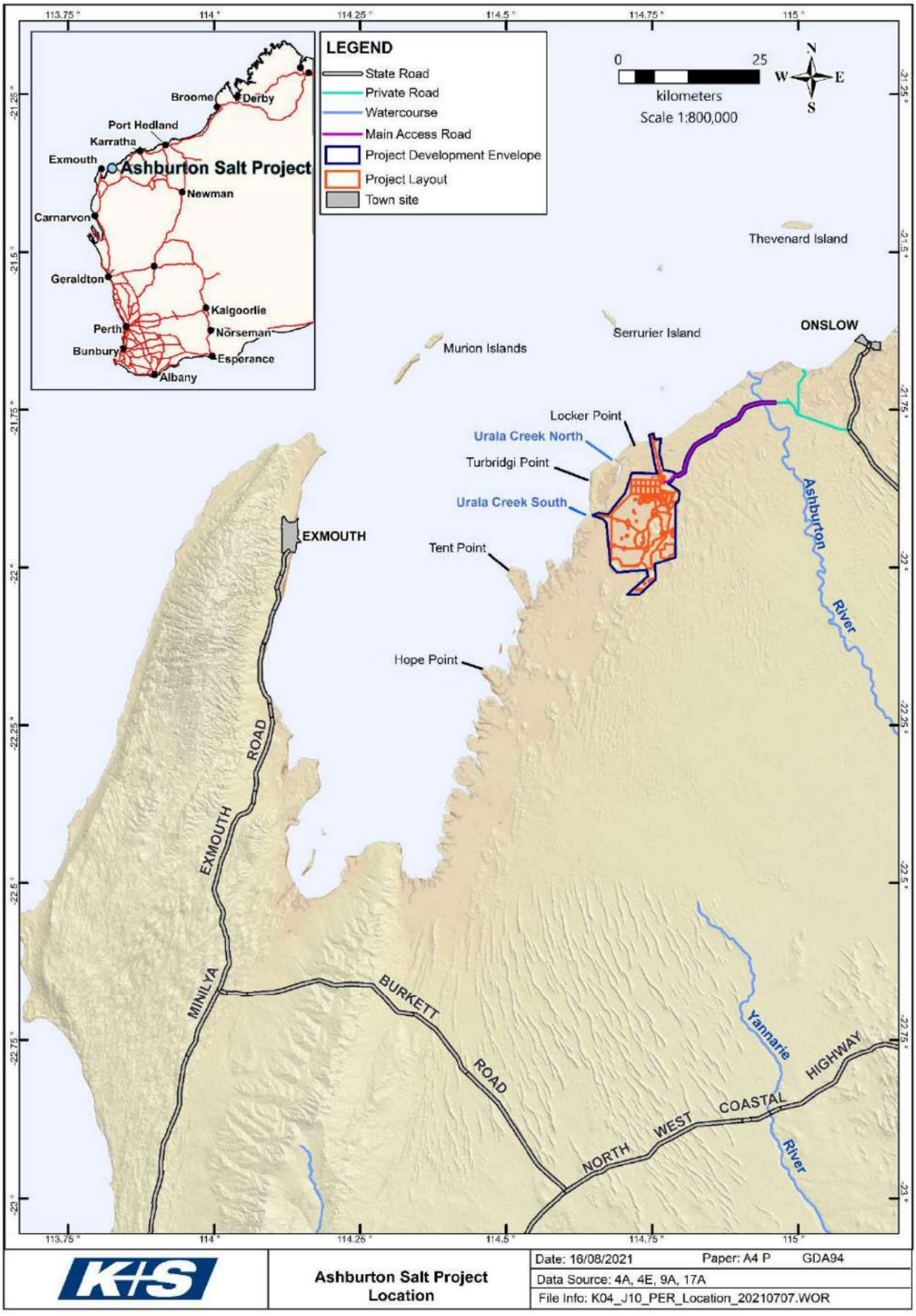

Figure 1 Regional location of the Project

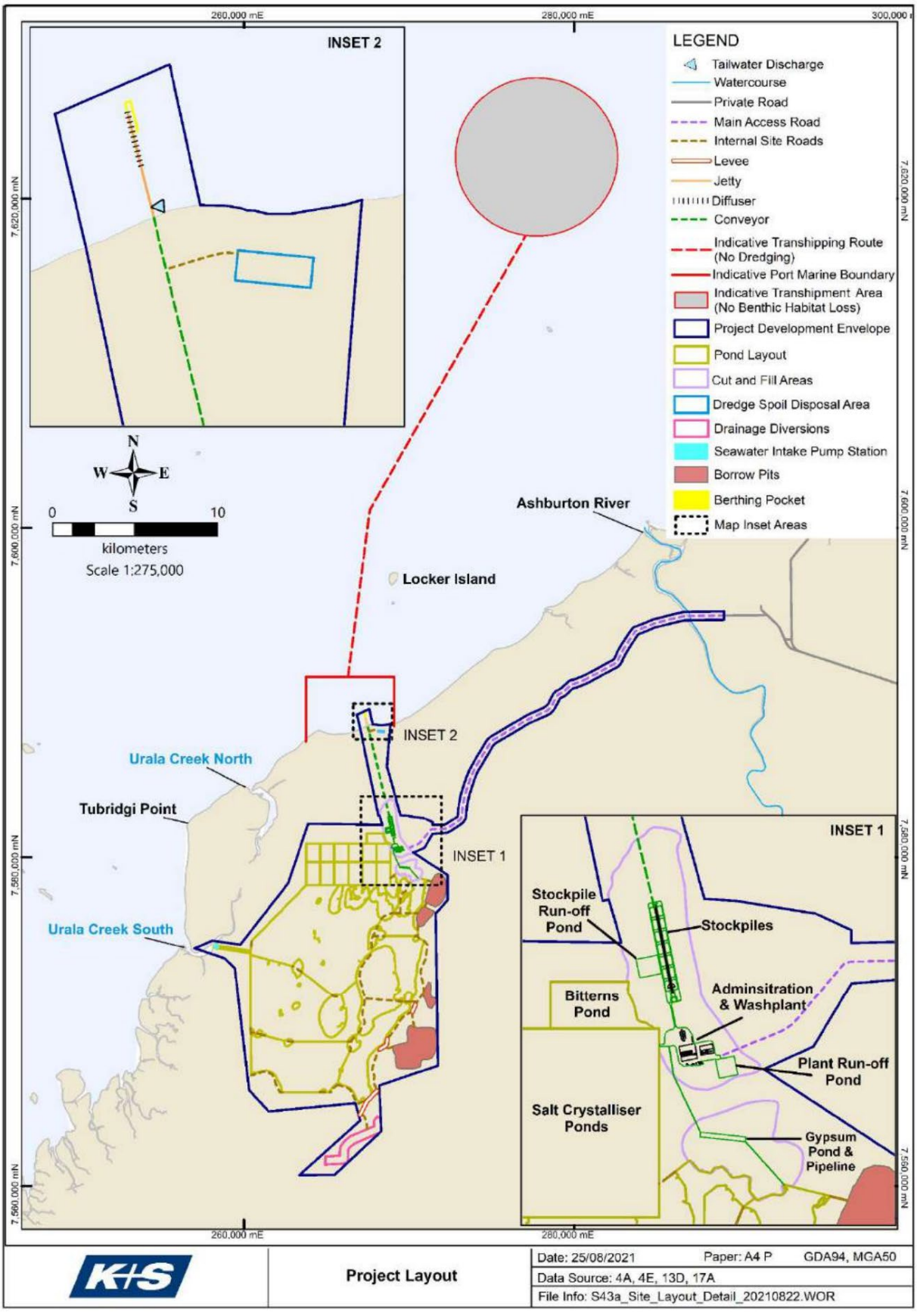

Figure 2 Proposed Development Envelopes and indicative layout

1.2. Purpose of this Plan

The purpose of this Marine Fauna Management Plan (MFMP) is to support environmental approval for the proposed Project, through demonstration of best-practice environmental management to achieve acceptable Environmental Protection Outcomes (EPOs). Specifically, the MFMP will:

1. Address the commitments of the Environmental Scoping Document to prepare management plans for Project activities that have the potential to impact marine fauna
2. Provide the framework for environmental management of the proposed activities relating to the construction and operation of the Project, including defining the EPOs and management targets associated with seawater intake, jetty construction, artificial lighting and vessel operations and anchorage to ensure that the Project EPOs are achieved
3. Define detailed management and monitoring actions to ensure that the Project EPOs are achieved.

1.2.1. Objectives

The general objective of the MFMP is to identify potential impacts to marine fauna from Project activities and to assign appropriate management targets and actions, where necessary, to ensure that EPOs can be achieved. The specific EPOs relevant to this MFMP are presented in Section 5 and are aligned with the environmental objective for marine fauna in the WA EPA State Guidance (EPA 2016), "To protect marine fauna so that biological diversity and ecological integrity are maintained."

1.2.2. Scope

The scope of the MFMP applies to Project construction (jetty and seawater intake construction and vessel operations), operations (seawater intake and vessel operations) and closure activities, that have the potential to impact on marine fauna. The MFMP includes:

- A description of the marine fauna in the region (as outlined in the Marine Fauna report previously compiled by AECOM (2022)), focussing on protected marine species and species of fisheries importance
- Mitigation and management of potential impacts identified in the marine fauna report such as impacts associated with underwater noise, entrainment and vessel interactions
- Mitigation and management of potential impacts to juvenile marine turtles and sawfish within Urala Creek South (particularly during biological seasons or periods of naturally elevated turbidity) from the seawater installation
- Mitigation for both construction and operational phases, though it is noted that cross referencing between this MFMP and other plans (Section 1.2.4) will be made where duplication exists.

Provisions of this MFMP exclude dredging-related activities, introduced marine pests and artificial light pollution. These aspects are managed through the dedicated Dredging and Sediment Management Plan (DSMP) (O2 Marine 2022a), Introduced Marine Pest Monitoring and Management Plan (IMPMMP) (O2 Marine 2022b) and Light Management Plan (LMP) (to be prepared prior to construction), respectively. Refer to Section 1.2.4 for associated management plans for the Project relevant to this MFMP.

This MFMP considers the WA EPA's Instructions on *How to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (EPA 2021a) and details the specific process for continual revision and improvement of the MFMP any time the Project progresses, or at any time key processes alter and new risks are identified.

1.2.3. Associated Documents

Other studies for the Project, which inform the provisions of this MFMP include:

- A Marine Fauna Impact Assessment undertaken by AECOM (2022), which was informed by:
  - Benchmark Light Survey and Modelling (Pendoley Environmental 2020)
  - Underwater Noise Modelling (Talis 2021)
  - Sawfish Surveys (Morgan et al. 2020)
  - Ecotoxicology Assessment (AECOM 2021)
- Seawater Intake Assessment (Water Technology 2018)
- Marine and Coastal Assessment and Modelling (Water Technology 2022).

1.2.4. Management not within the Scope of this Plan

Associated management plans for the Project relevant to this MFMP include:

- DSMP (O2 Marine 2022a)
- IMPMMP (O2 Marine 2022b)
- LMP (to be prepared prior to construction)
- Marine Environmental Quality Monitoring and Management Plan (MEQMMP) (O2 Marine 2022c).

1.3. Relevant Policy and Guidance

The potential environmental impacts of the Project were considered at Commonwealth, State and Local Authority level with each Authority providing guidance on the level of assessment required. This MFMP forms a key documented process and is a tool for recognising and managing the various conditions and requirements of the environmental approvals and relevant legislation as listed below.

1.3.1. Commonwealth

1.3.1.1. Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act establishes a process for the assessment and approval of proposed actions that are likely to have a significant impact on Matters of National Environmental Significance (MNES) or on Commonwealth land. The EPBC Act lists 'nationally significant' animals, plants, habitats and places as MNES and aims to ensure that potential negative impacts on them are carefully considered before changes in land use or new developments are approved.

EPBC Act documents applicable to this MFMP are summarised below.

Conservation Advice

Conservation Advice relevant to this MFMP includes:

- Approved Conservation Advice for *Pristis clavata* (Dwarf sawfish) (DEWHA 2009)

- Approved Conservation Advice for Green Sawfish (DEWHA 2008a)
- Conservation Advice *Rhincodon typus* whale shark (TSSC 2015).

Listing Advice

Listing Advice relevant to this MFMP includes:

- Commonwealth Listing Advice *Megaptera novaeangliae* Humpback Whale (DAWE 2022)
- Commonwealth Listing Advice on Incidental catch (bycatch) of sea turtles during coastal otter-trawling operations within Australian waters north of 28°S (TSSC 2001)
- Commonwealth Listing Advice for *Pristis zijsron* (Green Sawfish) (TSSC 2008)
- Commonwealth Listing Advice on *Rhincodon typus* (Whale shark) (TSSC 2001).

Recovery Plans

Recovery Plans relevant to this MFMP include:

- Recovery Plan for Marine Turtles in Australia (Commonwealth of Australia 2017a)
- Sawfish and River Sharks Multispecies Recovery Plan (DoE 2015).

Threat Abatement Plans

Threat Abatement Plans relevant to the MFMP include:

- Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans (DoEE 2018).

1.3.1.2. Other Policy and Guidance

Other applicable Commonwealth legislation, national guidelines and resources include, but are not limited to:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018)
- National Assessment Guidelines for Dredging (Commonwealth of Australia 2009)
- Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing: Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts (National Marine Fisheries Service 2016)
- A Directory of Important Wetlands in Australia (ANCA 2005)
- Biofouling Biosecurity Policy (DPIRD 2017)
- Australian Ballast Water Management Requirements: Version 8 (Commonwealth of Australia 2020)
- Draft National Strategy for Mitigating Vessel Strike of Marine Mega-fauna (Commonwealth of Australia 2016)
- Australian National Guidelines for Whale and Dolphin Watching 2017 (Commonwealth of Australia 2017c)
- National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds (Commonwealth of Australia 2020)
- National Conservation Values Atlas (DCCEEW 2020).

1.3.2. State

1.3.2.1. Environmental Protection Act 1986

This document has been prepared in accordance with the relevant guidelines for this Project, which apply to the management and assessment of marine fauna in WA. These include, but are not limited to:

- EPA Statement of Environmental Principles, Factors and Objectives (EPA 2021b)
- EPA Environmental Factor Guideline: Marine Fauna (EPA 2016)
- Marine Bioregional Plan for the North-west Marine Region (Commonwealth of Australia 2012).

1.3.2.2. Other Policy and Guidance

Other applicable State (WA) legislation and regulations include, but are not limited to:

- *Biodiversity Conservation Act 2016 (BC Act)*
- *Fish Resources Management Act 1994 (FRM Act)*
- Environmental Protection Regulations 1987.

1.4. Approval Details

1.4.1. Condition Requirements

[HOLD: Insert approval conditions]

1.4.2. Approval Holder Details

Details of the holder of the approvals relevant to this MFMP are provided in Table 3.

Table 3 Approval holder details

Company Name:	K+S Salt Australia Pty Ltd
Australian Business Number (ABN):	Australian Company Number: 607 033 447
Address:	Level 27 Number 44 St Georges Terrace Perth WA 6000
Key Contact (Role):	Gerrit Goedecke
Key Contact Details:	Gerrit.goedecke@k-plus-s.com (08) 6316 4589

2. Roles and Responsibilities

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

Table 4 Project roles and responsibilities

Position	Responsibility
Proponent (as principal)	• Overall responsibility for implementation of this MFMP • Overall responsibility for complying with relevant legislation, standards, and guidelines • Ensures all Project activities are conducted in an environment safe for both site personnel and the public • Reports on environmental performance for the Project to key stakeholders • Responsible for the implementation of the environmental monitoring program and inspections • Prepares environmental monitoring reports • Responsible for environmental compliance reporting in accordance with Ministerial Conditions (pending) • Responsible for reporting all environmental non-compliance incidents in accordance with Ministerial Conditions (pending).
Contractors (piling, seawater intake, dredging, vessels)	• Undertakes construction works • Prepares and implements an environmental management plan in accordance with the requirements of this MFMP • Implements the management actions of this MFMP • 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 Proponent Environmental Advisor within 24 hours in accordance with incident management procedures (Appendix B).
All persons involved in the Project	• Comply with the requirements of this MFMP • 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.

3. Existing Environment

3.1. Marine Fauna

The Project is located is within the southern reaches of the North-west Marine region, northeast of the Exmouth Gulf and the Ningaloo Marine Park.

A marine fauna impact assessment was undertaken for the Project by AECOM (2022), which collated database searches, desktop literature review and gap analysis information, and Project specific survey data (refer to Section 1.2.3 for marine fauna studies undertaken for the Project). This information informed a 'likelihood of occurrence' assessment for conservation significant species, which determined if a species is likely to occur, may occur or unlikely to occur in the Project Area. The marine environment within and adjacent to the Project Area supports an array of marine fauna, including conservation significant and socio-economically important species. Marine fauna species covered under this MFMP are species that are 'likely to occur' or 'may occur' within the Project Area, and include:

- Conservation significant species, listed as threatened or migratory under the EPBC Act, or as threatened or priority species under the WA BC Act
- Socio-economically important species such as target commercial fisheries species.

Forty-six protected marine species (26 avifauna species, 4 marine mammal species, 7 marine reptile species and 10 fish species) have been identified as 'likely to occur' (or their habitat is known to occur) or 'may occur' (or their habitat may occur) within the local marine region (AECOM 2022). Identification of 'key' species as those with the highest conservation value, which could be impacted by the Project ensures that the correct level of attention is paid to those at greatest potential risk. Ecological windows and seasonality of key conservation significant species that are 'likely to occur' in the Project Area are summarised in Table 5.

The Project Area intersects with several commercial fisheries boundaries. Two fisheries and their target species have been identified to be considered potentially impacted by the Project (Table 6). Refer to Table 5 for ecological windows of target prawn species. Ecological windows relate to species undertaking biologically important behaviours such as breeding, foraging, migration and nesting.

Table 5 Ecological windows and seasonality of key conservation significant species that are 'likely to occur' in the Project Area

Species	J	F	M	A	M	J	J	A	S	O	N	D	Data Source
Elasmobranchs - Sharks, fish and rays													
Green sawfish	■	■	■	■	■	■	■	■	■	■	■	■	Morgan et al. (2017)
Marine mammals													
Humpback whale – northern migration (Jurien Bay to Montebello)					■	■	■	■	■	■	■		Irvine and Salgado Kent (2018); CALM (2005); Environment Australia (2002), Jenner et al. (2001); McCauley and Jenner (2001)
Humpback whale – southern migration (Jurien Bay to Montebello)							■	■	■	■	■		Irvine and Salgado Kent (2018); McCauley and Jenner (2001)
Australian humpback dolphin	■	■	■	■	■	■	■	■	■	■	■	■	Hanf et al. (2022)
Dugong	■	■	■	■	■	■	■	■	■	■	■	■	Hodgson et al. (2008)
Marine reptiles													
Hawksbill turtle – various nesting areas	■	■								■	■	■	DAWE (2021b); Commonwealth of Australia (2017a); DEWHA (2008b); CALM (2005)
Flatback turtle – various nesting areas	■	■	■							■	■	■	DAWE (2021c); Commonwealth of Australia (2017a); DEWHA (2008b); CALM (2005)
Green turtle – various nesting areas	■	■	■								■	■	Commonwealth of Australia (2017a); DEWHA (2008b); CALM (2005)
Loggerhead turtle – various nesting areas	■	■	■	■	■						■	■	DAWE (2021d); Commonwealth of Australia (2017a); DEWHA (2008b); CALM (2005)

* Light blue represents species likely to be present in the region and dark blue represents peak period: presence of animals reliable and predictable each year.

Species	J	F	M	A	M	J	J	A	S	O	N	D	Data Source
Socio-economically important species													
Brown tiger prawn (*Penaeus esculentus*)													Loneragan et al. (2013)
Western king prawn (*P. latisulcatus*)													Noell et al. (2021)
* Light blue represents spawning and dark blue represents migration from nursery grounds.													

Table 6 Commercial fisheries relevant to the Project

Fishery	Target species	Relevance to the Project
Exmouth Gulf Prawn Fishery	Brown tiger prawns Western king prawns Blue endeavour prawns Banana prawns	The Project Area is adjacent to the northern section of the Exmouth Gulf Prawn Fishery, with Urala Creek South (the proposed seawater intake location) located within the dedicated nursery area for the Exmouth Gulf Prawn Fishery. The target species of the Exmouth Gulf Prawn Fishery have been identified as being impacted by entrainment in the larval/juvenile stages within the seawater intake in Urala Creek South. The proportion of nursery area likely to be influenced by the Project has been modelled and predicted to be 0.39% of the total size of the nursery area (Water Technology 2018). Therefore, the Project is unlikely to have a significant impact on the fishery.
North Coast Prawn Fishery including Onslow Prawn Managed Fishery (OPMF)	Western king prawns Brown tiger prawns Endeavour prawns (*Metapenaeus* spp.).	The OPMF occurs to the immediate north of the jetty and bitterns discharge point and the offshore transhipment locations are located within Area 1. Due to the general low trawl effort that has been undertaken in recent years, and the extent of the fishery, the Project is considered to have minimal impact on the fishery.

3.2. Important Habitat

A summary of important habitats for key marine fauna species in the local marine region is provided in Table 7.

Table 7 Important marine fauna habitat associations (AECOM 2022)

Habitat type	Marine fauna
Mangroves	Juvenile green turtles are known to forage on mangroves and were recorded in both Urala Creek North and Urala Creek South.
Soft sediment (including potential	Dugongs and turtles are known to forage on seagrass beds and these species were recorded opportunistically. Sawfish and other are known to forage in inshore marine

Habitat type	Marine fauna
seagrass habitat, tidal creeks and shallow intertidal zones)	waters, river mouths, embankments and along sandy and muddy beaches. A number of elasmobranch species were recorded in Urala Creek North and in the nearshore shallow intertidal zone. Both Urala Creek North and Urala Creek South are believed to be nursery areas for species of elasmobranchs.
Sandy beaches	The beach from Urala Creek North to Ashburton River is low quality nesting habitat. Turtles nest at low density in sandy beaches locally, with higher density nesting on local islands.
Offshore waters	Offshore waters including Exmouth Gulf and North East to Barrow Island are habitat for marine mammals such as migrating and calving humpback whales and Australian humpback dolphins. Offshore waters are also used as transit zones for dugongs, turtles and elasmobranchs.

3.2.1. Biologically Important Areas

Biologically Important Areas (BIAs) are spatially defined zones where aggregations of individuals of a species are known to display biologically important behaviours such as foraging, breeding, resting or migration (DAWE 2021a). They are important components of Species' Recovery Plans. A search of the Conservation Values Atlas identified BIAs within proximity to the Project area, which are summarised in Table 8.

Table 8 Biologically Important Areas that spatially overlap with the Project Area (AECOM 2022)

Species	BIA Type	Marine Component
Humpback whale	Migration and resting	Nearshore, navigation route and Offshore
Pygmy blue whale	Distribution	Nearshore, navigation route and Offshore
Whale shark	Foraging	Offshore, Southwestern boundary of the BIA
Flatback turtle	Nesting and internesting*	Nearshore, navigation route and Offshore
Hawksbill turtle	Internesting*	
Green turtle	Internesting*	Nearshore, navigation route and Offshore
Loggerhead turtle	Internesting*	
Dugong	Nursing and foraging	Nearshore

* Includes internesting buffer

3.2.2. Critical Habitat Areas

The Recovery Plan for Marine Turtles in Australia 2017-2027 (Commonwealth of Australia 2017a) identifies habitat critical to the survival of various marine turtle species. These critical habitats are not listed on the Register of Critical Habitat under the EPBC Act; however, they are relevant for the Project.

Critical Habitat Areas for EPBC Act listed marine turtles that are 'likely to occur' in the Project Area are summarised in Table 9.

Table 9 Marine turtle Critical Habitat areas that spatially overlap the Project Area (AECOM 2022)

Species	Activity	Marine Component
Flatback Turtle	Nesting	Nearshore and Offshore
Green Turtle	Nesting	Nearshore and Offshore
Hawksbill Turtle	Nesting	Nearshore and Offshore
Loggerhead Turtle	Nesting	Nearshore (Urala Creek South) and Offshore

4. Relevant Project Activities

The Project will involve activities that have the potential to impact on marine fauna. These activities include the construction and operation of a seawater intake and jetty, dredging activities, bitterns discharge from the salt crystalliser ponds, and vessel movements. Potential impacts to marine fauna from dredging activities and bitterns discharge will be managed under the DSMP (O2 Marine 2022a) and MEQMMP (O2 Marine 2022c), respectively.

The Project components relevant to this MFMP are summarised in the following sections (AECOM 2021a).

4.1. Seawater Intake

The location of the seawater intake in Urala Creek South is shown in Figure 2. The annual intake is estimated to be 250 GL. The peak intake is required in October to December when evaporation rates are highest, with an estimated monthly intake during the peak months of 29 GL per month. This includes all seawater required for the evaporation ponds, wash plant and bitterns dilution water (approximately one part bitterns is expected to be diluted with one part seawater). The seawater intake comprises:

- A rock armoured pump inlet well screened to reduce the risk of entrapment of floating debris and large fauna, with the following design parameters:
  - The inlet well screen will be oriented, and the intake velocity managed, so as to reduce the risk of fauna impingement (i.e., 'trapping' against the screens) by maintaining a water flow velocity at the screens of less than 0.15 metres per second (m/s), in line with USEPA recommendations for protection of 96% of motile species concluded from fish swim speeds (USEPA 2014).
  - The inlet well will be positioned in the optimal location to minimise environmental impacts such as erosion and scour.
- Several seawater intake pipes will be located within the inlet well, with screens across the downward facing pipe openings.

The seawater extraction process will be driven via a pump station situated on the creek bank which will transport seawater into a connecting intake channel leading the first evaporation pond.

There will be a temporary and localised increase in the turbidity of tidal waters of Urala Creek South during construction of the seawater intake inlet well. Background turbidity concentrations in the local marine region are high under existing conditions and intertidal environments in the area are subject to very high turbidity during flood events. Therefore, it is unlikely that any temporary increases in turbidity from the seawater intake construction works would result in additional sedimentation at a scale that could threaten the tidal creek habitat or mangrove communities. Spoil from the excavation of the inlet well will be contained within the seawater intake channel embankments, with water evaporated and sediment used in construction works (i.e., there will be no tailwater discharge into the creek). Sedimentation reduction measures, such as silt curtains, will be included in the Construction Environmental Management Plan (CEMP).

4.2. Jetty

A 700 m trestle jetty will be constructed to facilitate the loading of salt onto a purpose-built shallow draft, self-propelled transhipment vessel ('transhipper') that travels at an approximate speed of nine knots (kn), with a

maximum draft of 6 m, when fully loaded. Construction of the jetty will comprise installation of tubular piles that will be driven in using a hydraulic impact hammer, this method will also be used to install the required dolphins and restraint structure. The first 180 m of the trestle jetty will be constructed on the mud flat reef which is exposed at low tide. The remaining 530 m will be in shallow water at low tide. The piles will be driven in one at a time and it is assumed minimal dressing of the piles will be required.

4.3. Vessel Movements and Anchorage

The transhipment vessel will transport the salt from the jetty to ocean going vessels that will be anchored approximately 14 nautical miles (nm) offshore (see Figure 2). Within the transhipment area, suitable anchorage areas will be designated in sandy areas to ensure sufficient anchor holding capacity.

A total transhipper cycle time of 13.21 hours has been calculated by the project of which a total of 4.25 hours will be spent travelling to and from the marine jetty to the offshore loading locations. The remainder of the time will be spent loading and unloading. It is estimated that nine cycles (approximately 4.8 days) are required to load the ocean-going vessel.

The number of ocean-going vessel and transhipper movements expected will depend on international demand for the salt product, which is difficult to predict with certainty. However, the following estimates are provided to indicate the scale of potential vessel movements:

- Based on a maximum project production level of 4.7 mtpa, ocean going vessel capacity of 70,000 t and 8,000 t transhipper parcel loads:
  - 67 ocean going vessels proceeding to anchor points per year
  - 587 transhipper movements per year
- Based on a slightly lower project production level of 4.5 mtpa, ocean going vessel capacity of 150,000 t and 12,000 t transhipper parcel loads:
  - 30 ocean going vessels proceeding to anchor points per year
  - 375 transhipper movements per year.

5. Key Environmental Factor

5.1. Potential Impact Pathways

The key environmental factor (marine fauna) and associated objective to be managed under this MFMP have been derived from the WA EPA's *Statement of Environmental Principles, Factors and Objectives and Aims of EIA* (EPA 2021b), which outlines objectives aimed at protecting all environments (Themes) including: Sea, Land, Water, Air and People. The EPA objective for marine fauna is, "To protect marine fauna so that biological diversity and ecological integrity are maintained." The Project specific EPOs and Management Targets (MTs) for marine fauna are outlined in Table 10.

Table 10 Potential environmental impacts and associated Project specific Environmental Protection Outcomes and Management Targets

Project Activity	Potential Environmental Impact Pathway	Environmental Protection Outcome	Management Target	Risk Management Strategy
Jetty construction and operation (including piling works)	0.99 ha of direct loss of sandy beach (low quality turtle nesting habitat) due to jetty construction.	No reported negative impacts on marine fauna or their habitat attributable to marine infrastructure.	No reduction in marine fauna habitat outside of construction footprints.	Risk Management Strategies are presented in Sections 5.2 and 5.3.1.
	Potential for hearing related damage or behavioural responses as a result of underwater noise (in particular piling).		No incidences of marine fauna behavioural disturbance, injury or death as a result of underwater noise.	
	Injury or death of marine fauna due to vessel movement (strike).		No incidences of marine fauna injury or death as a result of vessel strike.	
	Potential alteration of movement pathways as a result of jetty construction.		No permanent alteration of marine fauna movement pathways as a result of jetty construction.	

Project Activity	Potential Environmental Impact Pathway	Environmental Protection Outcome	Management Target	Risk Management Strategy
Seawater intake construction and operation	4.23 ha direct loss of mangroves due to construction of the seawater intake.	No irreversible loss, or serious damage to marine fauna habitat outside of the seawater intake footprint.	No reduction in marine fauna habitat outside of construction footprints.	Risk Management Strategies are presented in Sections 5.2 and 5.3.1.
	Potential entrapment or injury in seawater intake.	No reported negative impacts on marine fauna attributable to seawater intake.	No incidences of marine fauna entrapment or injury as a result of seawater intake.	
	Entrainment of larval and juvenile phases of commercial prawn species by seawater intake.			
	Potential alteration to nursery habitat in Urala Creek South as a result of the seawater intake operations.	No reported negative impacts on commercial species in the Exmouth Gulf ecosystem.	No impact to nursery habitat in Urala Creek South beyond immediate surrounds of the seawater intake operations.	
	Indirect impact to 0.34 ha of mangroves due to the barrier effect of the seawater intake.	No irreversible loss, or serious damage to marine fauna habitat outside of the seawater intake footprint.	No reduction in marine fauna habitat outside of construction footprints.	
Transhipping and other vessel movements	Injury or death of marine fauna due to vessel movement (strike).	No reported negative impacts on marine fauna attributable to transhipping.	No incidences of marine fauna injury or death as a result of vessel strike.	Risk Management Strategies are presented in Sections 5.2 and 5.3.1.
Unplanned hydrocarbon release	Injury or death of marine fauna or impact on critical habitat due to unplanned hydrocarbon release.	No reported negative impacts on marine fauna attributable to unplanned hydrocarbon release.	No incidences of marine fauna injury or death as a result of hydrocarbon spills.	Risk Management Strategies are presented in Sections 5.2 and 5.3.2.

Project Activity	Potential Environmental Impact Pathway	Environmental Protection Outcome	Management Target	Risk Management Strategy
Entanglement/ plastic ingestion from marine debris	Injury or death of marine fauna due to marine debris.	No reported negative impacts on marine fauna attributable to marine debris.	No incidences of marine fauna injury or death as a result of marine debris.	Risk Management Strategies are presented in Sections 5.2 and 5.3.2.

5.2. Proposed Mitigation Measures

A summary of relevant potential impacts to EPCB Act listed marine species from Project activities, and associated mitigation measures are detailed in Table 11.

Table 11 Potential impacts from Project activities and proposed mitigation measures (AECOM 2022)

Potential Impact	Avoid	Minimise	Significant Residual impact
Direct and indirect impacts from loss of marine fauna habitat due to removal or disturbance of benthic habitat	Design and planning processes, along with appropriate mitigation measures, will ensure minimal impacts to regional benthic communities. Turbidity is only expected to be localised and temporary.	• Optimisation of project design to minimise impacts to marine fauna habitat from seawater intake and jetty construction. • Implementation of a CEMP.	No. There will be loss of: • 0.04% of Mangroves of Exmouth Gulf East • 0.10% of sandy beaches along Exmouth Gulf East and offshore islands. Due to the availability of similar habitat in surrounding areas, it is considered that there is no potential for significant impacts upon the biological diversity and ecological integrity of marine fauna habitat and / or marine fauna populations in the region as a result of potential habitat loss.
Injury or death of marine fauna due to vessel movement (strike).	All vessels engaged during construction and operation will adhere to measures outlined in this MFMP and approach standards set in the National Guidelines for Whale and Dolphin Watching (Commonwealth of Australia 2017c) and WA BC Act to avoid impacts to	• All operational vessels will travel no faster than 9 kn. • Vessel captain and crew must maintain a vigilant watch for all protected marine fauna species and slow down, or alter course, as appropriate, to avoid striking any protected species. The presence of a single individual at the surface may indicate the presence of submerged animals in the vicinity; therefore, precautionary measures should always be exercised. • All vessel crew members must be briefed in the identification of protected marine fauna species that may occur in the survey area and in regulations and best practices for avoiding vessel collisions. • Any time a vessel is underway, a trained MFO must monitor for marine fauna in accordance with EPBC Regulations 2000 – Part 8	No. The risk of marine fauna being struck by vessels during the Project will be reduced through the implementation of this MFMP, trained MFOs on vessels, and the mitigation measures outlined in this table. Therefore, it is considered that vessel operations during construction and operation of the Project will not present a risk of significant impact to the biological diversity or ecological integrity of marine fauna populations in the region.

Potential Impact	Avoid	Minimise	Significant Residual impact
	marine fauna from vessel strike.	Division 8.1: National Guidelines for Whale and Dolphin Watching (Commonwealth of Australia 2017c) and the WA BC Act, which will be applied as follows: • Project vessels will not travel faster than 6 kn within 300 m of a whale (caution zone) and not approach closer than 100 m from a whale (no approach zone) • Project vessels will not travel faster than 6 kn within 150 m of a dolphin (caution zone) and not approach closer than 50 m from a dolphin (no approach zone), with the exception of animals bow-riding • Vessels must not enter the caution zone for whales and dolphins when a calf is a present • No more than three vessels are allowed within the caution zone at any one time • Vessels must maintain a separation distance of 100 m from dugongs and 50 m from marine turtles • If the cetacean, turtle or dugong shows signs of being disturbed, Project vessels will immediately withdraw from the caution zone at a constant speed of less than 6 kn • Vessels will not travel faster than 6 kn within 250 m of a whale shark and will not approach closer than 30 m to a whale shark. • Vessels will not approach, circle or wait in front of protected marine species for the purposes of casual viewing. • A watch will be maintained throughout the Project operations for stranded, injured or dead marine fauna; if observed, the Department of Biodiversity, Conservation and Attractions (DBCA) Wildcare Helpline (08 9474 9055) will be contacted for advice on retrieval, treatment or post-mortem by the DBCA Parks and Wildlife Service.	
Direct impacts from entrapment and	The seawater intake pump design has been engineered to reduce the	• Dual screening of the intake structures. Firstly, screening of the inlet well from which water will be extracted. Secondly, screening of the pipe openings within the inlet well, which will extract	No. It is considered that with the implementation of dual screening and intake pump velocity below the

Potential Impact	Avoid	Minimise	Significant Residual impact

entrainment in seawater intake	risk of potential impacts on marine fauna.	seawater. These dual screens will prevent and minimise entrapment and entrainment of marine fauna.
		• K+S has committed to ensuring the flow velocity of the intake pumps is less than 0.15 m/s. The inlet well screening concept design employs Johnson screens that extend from above the water line, to the bottom of the inlet well, with a total length of approximately 50 m (Vortex Australia, 2020). The mean flow velocity produced by the operating pumps has been calculated at 0.11 m/s, 25% less than the USEPA (2014) guideline of 0.15 m/s for the protection of 96% of motile species (Vortex Australia 2020).
		• Velocities at the pump cut-off tide peak at 0.4 m/s and hence marine fauna that swim slower will be drawn into the inlet well but unlikely to be trapped against the screen (Vortex Australia 2020). Pumping down time during the tidal cycle is approximately 6 hours a day and at the lowest swim-rate of 0.15 m/s, marine fauna can swim back out through the well in roughly 3 minutes (Vortex Australia 2020).
		• When the pump stations are being commissioned the screens will be intensively monitored for the first 14 days. If there are any incidences of fauna entrapment, the pumps will be immediately shut down to allow:
		  • Any entrapped fauna to swim out of the well
		  • Improvements to the screening or the seawater intake design/operation until entrapment no longer occurs.
			recommended 0.15 m/s, the risk of entrapment of marine fauna will be sufficiently low that it will not present a risk of significant impact to the biological diversity or ecological integrity of marine fauna populations in the region.
			Entrainment of juvenile fish and prawn larvae will not be able to be avoided. However, pump velocity and cycles will assist in reducing the number of larvae entrained. Due to the size of the prawn nursery area in Exmouth Gulf, it is not anticipated that the Project will result in a reduction of biological diversity and or ecological integrity of the commercial prawn industry.

Direct impacts from underwater noise emissions	Marine construction activities will be undertaken outside of key ecological windows for marine fauna species, as far as practicable.	• Pile driving activities will be undertaken only during daylight hours. • Where practicable, impact piling activities will be undertaken during low tide. • Where practicable, piling operations will be undertaken outside key ecological windows for the following protected marine species: • Piling will avoid the sawfish pupping window (September – November)	No. Underwater noise generating activities have the potential to result in behavioural responses of some marine fauna species. However, with appropriate timing of activities outside of key ecological windows (see Section 3.1) and implementation of a Piling Procedure that includes the mitigation measures detailed in this table, it is

Potential Impact	Avoid	Minimise	Significant Residual impact
		• Piling will avoid the turtle mating, nesting and hatching window (October - February) • Piling will avoid the southern migration of Humpback Whales (August-December). • The protected marine species observation (1,200 m) and exclusion zones (550 m) will be included within the Piling Procedure. • A dedicated MFO will maintain a watch for the presence of any protected marine species during piling works, commencing ten minutes before the "soft start" of pile driving activities. The watch will be made from an elevated position, where a clear line-of-sight is achievable to a distance of 1,200 m from the pile driving location. • The MFO will not be engaged in any other activities during the ten-minute watch period. If any marine fauna are observed, the "soft start" will not proceed until they have been observed to move outside the observation zone or have not been sighted for a period of ten minutes, and no other protected species are present within the observation and exclusion zones. • Pile driving will commence each day with a "soft start", where pile driving impact force is gradually scaled up over a five-minute period. This is considered to provide an opportunity for any sensitive marine fauna to leave the area before full hammering energy is applied. • Once pile driving has commenced, the MFO will maintain ongoing visual scanning of the observation and exclusion zones and, every 30 minutes, will dedicate a period of five minutes for observation (from an elevated position) for protected marine fauna. • Where protected marine fauna is observed in the exclusion zone (550 m) then piling operations shall cease until protected marine fauna have existed the management zones or have not been sighted for 10 minutes. Once protected species have exited the management zone, soft-start piling may recommence.	considered that the risk of significant impacts upon the biological diversity and/or ecological integrity of marine fauna populations in the region from underwater noise can be minimised.

Potential Impact	Avoid	Minimise	Significant Residual impact
		• Where protected marine fauna is not observed in the management zone, then normal operations may continue. • All vessel operations are to be undertaken in accordance with the mitigation measures detailed above and noise management protocols outlined in Section 5.3.3. • Avoid any sources of noise not necessary to construction works.	
Indirect impacts from hydrocarbon spill causing injury or death of marine fauna or impact on critical habitat	Hydrocarbon monitoring and management will be implemented to avoid impacts from hydrocarbon spills in the marine environment.	• Accidental release of hydrocarbons to the marine environment will be avoided and mitigated as detailed in Section 5.3.2.	No.
Direct impacts from entanglement/ plastic ingestion from marine debris	All waste will be appropriately stored and managed to prevent debris and waste from entering the marine environment. K+S will implement the Waste Management Plan and subsequent Waste Management Procedure.	• Standardised waste and hydrocarbon management measures (as per existing requirements) will be implemented during construction and operations to minimise the risk of unplanned spills and debris from entering the marine environment. • All construction rubbish, packing material, timber, sewage and plastic shall be collected and stored within the landside Project area prior to removal offsite.	No.
Light pollution originating from Project vessels and operations	Project design, engineering and operational solutions will be implemented where practicable to avoid light impacts as detailed in the management controls and measures in the LMP.	• Project design, engineering and operational solutions will be implemented where practicable to minimise the problem light(s) as detailed in the management controls and measures in the LMP.	No. As shown in the impact assessment residual impacts originate on-site so can be managed appropriately through implementation of the LMP. Light spill can be contained, and impacts can be mitigated.

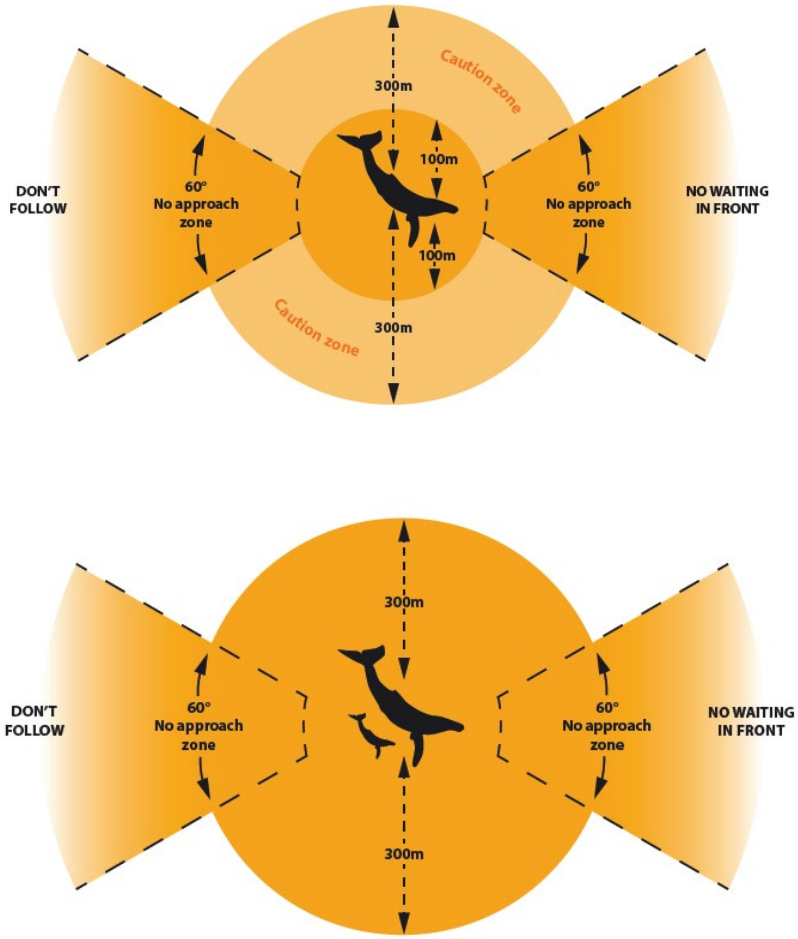

Figure 3 Vessel approach distances for adult whales (top) and whales with calves (bottom) (Commonwealth of Australia 2017c)

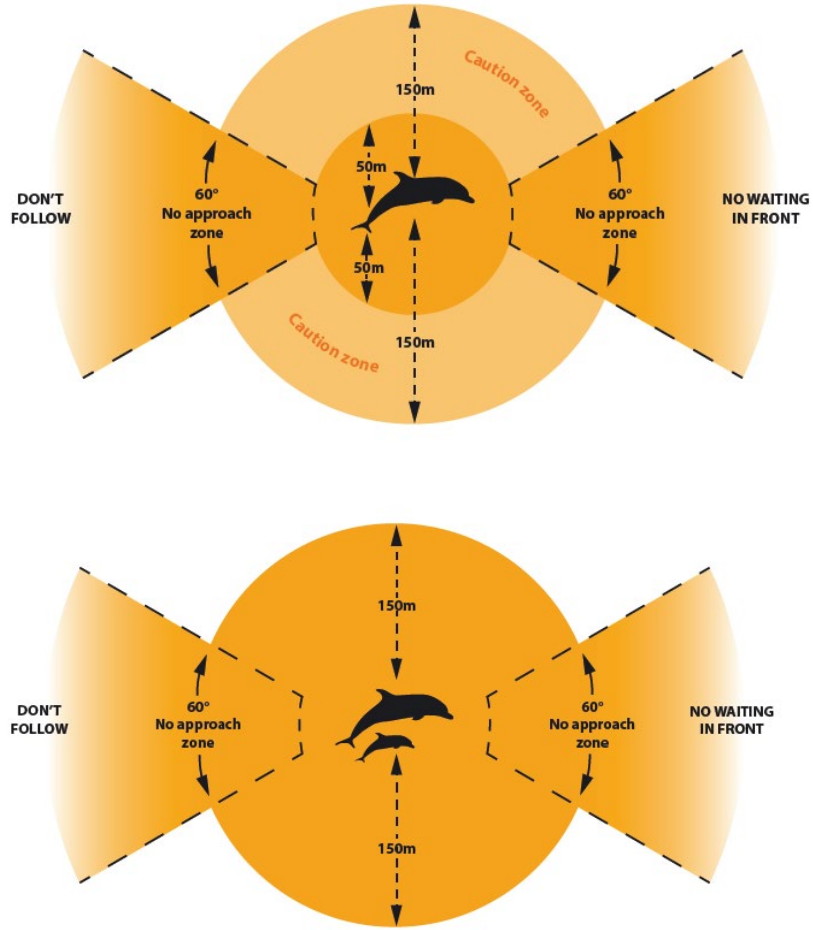

Figure 4 Vessel approach distances for adult dolphins (top) and dolphins with calves (bottom) (Commonwealth of Australia 2017c)

5.3. Monitoring and Management

The potential environmental impacts identified above in Table 10 and Table 11 have been assigned monitoring and management actions to measure compliance against the EPOs and MTs. Management actions have been separated into:

- Tier 1 (which specially address the marine fauna environmental factor, including MNES)
- Tier 2 (which relate to the overall works and can be managed through standard operational procedures (including hydrocarbons and waste)).

5.3.1. Marine Fauna (Tier 1)

The (Tier 1) management actions proposed to minimise potential impacts on marine fauna (including MNES) from Project activities are described in Table 12.

Table 12 Management actions to minimise impacts on marine fauna

Environmental Factor	**Marine Fauna**					
Activity	Jetty construction (including piling works) Seawater intake General vessel operations					
Potential Impacts	• Loss of marine fauna habitat due to removal or disturbance of benthic habitat • Injury or death of marine fauna due to vessel movement (strike) • Entrapment and entrainment in seawater intake • Hearing related damage or behavioural responses as a result of underwater noise emissions • Hydrocarbon spill causing injury or death of marine fauna or impact on critical habitat • Entanglement/ plastic ingestion from marine debris.					
Management Targets	Management Actions		Environmental Performance			
	Item	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
No reduction in marine fauna habitat	1.1	Implement CEMP	Contractor	As per measures outlined in CEMP	As per measures outlined in CEMP	As per measures outlined in CEMP

outside of construction footprints						
No incidences of marine fauna injury or death as a result of vessel strike.	1.2	Implement marine fauna monitoring and management as outlined in Section 5.2 and 5.3.3. The maximum vessel speed within the Project Area is 9 kn (except within caution zones for marine fauna, where maximum vessel speed is 6 kn) and all vessels are to adhere to approach standards set in the National Guidelines for Whale and Dolphin Watching (Commonwealth of Australia 2017c) and WA BC Act (refer to Table 11).	Contractor	MFO daily records Final summary report Refer to Section 5.3.3	Daily Refer to Section 5.3.3	Where marine fauna is observed within an exclusion zone then activities will cease immediately.
No incidences of marine fauna entrapment or injury as a result of seawater intake.	1.3	Implement marine fauna monitoring and management as outlined in Section 5.2 and 5.3.3. The pump stations will be intensively monitored for the first 14 days.	Contractor	Refer to Section 5.3.3	As per measures outlined in Section 5.3.3	Pumps will be immediately shut down if any incidences of fauna entrapment.
No incidences of marine fauna behavioural disturbance, injury or death as a result of underwater noise.	1.4	Implement marine fauna monitoring and management as outlined in Section 5.2 and 5.3.3. Construction activities will be undertaken outside of key ecological windows, as far as practicable. Ensure all vessel equipment and machinery is in good condition and subject to regular maintenance. When in transit, all Project vessels will be operated in accordance with EPBC Regulations 2000- Part 8 Division 8.1 (Commonwealth of Australia 2017c) and the WA BC Act. Minimise the duration of run-time for vessel engines and thrusters by avoiding stand-by or running mode	Contractor	MFO daily records Final summary report Refer to Section 5.3.3	Daily Refer to Section 5.3.3.	Where marine fauna is observed within an exclusion zone then piling will cease immediately.

		to the degree practical and consistent with safe operations.				
No impact to nursery habitat in Urala Creek South beyond immediate surrounds of the seawater intake operations.	1.5	Implement measures outlined in Section 5.3.3 and CEMP.	Contractor	As per measures outlined in Section 5.3.3 and CEMP.	As per measures outlined in Section 5.3.3 and CEMP.	As per measures outlined in Section 5.3.3 and CEMP.
No impact to marine fauna or sensitive habitats from artificial light.	1.6	Implement LMP	Contractor (construction) and K+S (operations)	As per LMP	Ongoing	As per LMP

5.3.2. Other (Tier 2)

Hydrocarbon Management

The (Tier 2) management actions proposed to minimise potential impacts associated with hydrocarbon spills are described in Table 13.

Table 13 Management actions to minimise the risk of hydrocarbon pollution

Activity	General vessel operations					
Potential Impacts	• Impacts from hydrocarbon spill causing injury or death of marine fauna or impact on critical habitat.					
Management Targets	Management Actions		Environmental Performance			
	Item	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
Manage vessel bunkering, chemical storage and spill response to ensure no adverse impacts to the marine environment.	2.1	Document vessel bunkering management, including appropriately licensed bunkering facilities.	Contractor	Vessel management procedures.	Prior to vessel entering WA waters from overseas or interstate.	Vessel operations not to commence prior to development and Proponent approval of vessel bunkering management procedure.
	2.2	Undertake vessel maintenance and bunkering in accordance with contractors approved vessel management systems.	Contractor	Vessel management procedures.	For the duration of the Project.	Vessel bunkering management systems to be reviewed and refined (if required) in the event of an identified procedural breach or hydrocarbon spill.
	2..3	Implement industry standard hydrocarbon management practices (chemical handling, storage, segregation and spill response).	Contractor	Vessel management procedures. K+S, SoA/Department of Transport (DoT) to be notified immediately in the event of a hydrocarbon spill of any volume.	Prior to commencement of the Project.	Vessel operations not to commence prior to development and approval of vessel management procedures. Investigate spill event and review management actions and responses.
	2.4	Undertake an environmental inspection of all vessels.	Contractor	Vessel management procedures.	Prior to the commencement of the Project.	Vessel operations not to commence prior to development and approval of vessel management procedures.

Waste Management

The (Tier 2) management actions proposed to minimise potential impacts from waste on marine fauna are listed in Table 14.

Table 14 Management actions to manage waste

Activity	Incorrect or accidental disposal from a vessel					
Potential Impacts	• Impacts on marine fauna from entanglement/ plastic ingestion from marine debris.					
Management Targets	Management Actions		Environmental Performance			
	Item	Actions	Responsibility	Reporting/Evidence	Timing	Contingency
Manage waste in compliance with requirements for SoA and in accordance with MARPOL 73/78 Convention Annex IV (sewage) and Annex V (garbage).	3.1	Contractor to establish and implement a sewage and garbage disposal plan in accordance with SoA requirements and MARPOL 73/78.	Contractor	Plan – one week prior to activity Incident – within 12 hours of a reportable incidence	Prior to commencement of activity Duration of activity	K+S to approve Plan prior to commencement of activity. Plan and procedures to be revised to prevent recurrence of incident. K+S to audit performance during activity if/as required.
Manage the correct onshore disposal and reporting systems	3.2	Only a licenced Controlled Waste Carrier to be used for any controlled waste discharged ashore.	Contractor	Controlled waste tracking forms to be completed as soon as possible.	Duration of activity	K+S to audit performance during activity if/as required.
	3.3	All forms of waste need to be stored in appropriately labelled drums or tanks and be correctly disposed of and not discharged to the environment.	Contractor	Approval certification and tracking forms to be completed as soon as possible. Vessel waste management plan/procedures.	Duration of dredging operations	Plan and procedures to be reviewed and endorsed by K+S prior to activity. K+S to audit performance during dredging if/as required.
	3.4	Reporting of any type of spillage within the marine environment directly to the SoA.	Contractor	As soon as possible, within 24 hours.	Duration of the activity	Revise associated management plans or

						procedures to ensure no incident recurrence. SoA to audit performance during activity if/as required.

5.3.3. Marine Fauna Observations

Dedicated Marine Fauna Observers

Training and Qualifications

Dedicated MFOs will be used prior to and throughout the piling operations. Dedicated MFOs are to be a dedicated person engaged to undertake marine fauna observations and implement mitigation measures associated with the construction pile-driving. The dedicated MFO will be suitably trained and qualified, adhering to the requirements of the Wildlife Conservation (Closed Season Marine Mammals) Notice 1998. Dedicated MFOs must demonstrate a knowledge of marine wildlife species in the North-west region, including Threatened and Migratory Species listed under the EPBC Act, and BC Act and priority listing, including morphological and behavioural characteristics.

Evidence of personnel suitability will be kept on record through staff curriculum vitas, training certificates and in-field record keeping, which may be used in future audits. Information will include:

- MFO names and contact details
- Details of MFOs training (including provider and course dates)
- Previous experience as MFOs on piling surveys
- Other MFO experience.

Shifts

Dedicated MFO shifts will be set prior to field to prevent observer fatigue, which can reduce the quality of observations and data recording. From a health and safety perspective, having coordinated shifts will ensure that observers have amenity breaks and reduced weather exposure.

Platform

Dedicated MFO observations will be undertaken from a suitable elevated point, that provides an appropriate vantage point of the Management Zones and with unimpeded views around the noise source. This point may need to shift pending the location of the noise source on any given day (i.e., site construction activities).

Trained Marine Fauna Observer

Training and Qualifications

Trained MFOs are crew members trained in marine fauna species observations and mitigation measures, consistent with the Project environmental management plans. Trained MFOs will be on duty on Project vessel during construction and operational phases and may have other vessel duties. There will be always at least one Trained MFO on duty during construction and operations.

All vessel crews engaged in by the Client for the marine construction and operations of the Project will attend a minimum of one marine fauna induction to become familiar with the range of conservation significant marine fauna that could be present in the operational area and the risks the Projects construction and operations may present to this fauna. All commitments made by the Client to manage vessel interactions with conservation significant marine fauna will be included in the induction. The content of the induction will be updated as required to ensure it remains current and reflects the marine fauna being observed in the

operational area and any vessel interactions with these fauna that have occurred. This marine fauna induction can be combined with other crew inductions that may be required.

Protocols and Procedures

Construction Noise Management

The monitoring protocols and procedures for marine fauna observations during piling works have been informed by the underwater noise modelling undertaken by Talis (2021) to determine the best practice observation and exclusion zones for marine mammals and marine turtles (Table 15 and Figure 5).

Observation zones have been determined based on the modelled Temporary Threshold Shift (TTS) onset distance for marine fauna and exclusion zones are based on the modelled Permanent Threshold Shift (PTS) onset distance for marine fauna (Talis 2021). It is predicted from underwater sound modelling that the noise management zone distances for marine mammals and turtles (Table 15 and Figure 5), would be more than adequate to avoid the onset of injury (predicated as the threshold for the onset of TTS and PTS) and the avoidance of adverse behavioural effects. Noise management zones have been derived using worst case (most sensitive) fauna group threshold levels (sawfish and marine turtles at high tide) for impact piling (Talis 2021).

Table 15 Noise management zones for marine mammals (whales, dolphins and dugong) and marine turtles.

Observation Zone (metres)	Exclusion Zone (metres)
1,200	550

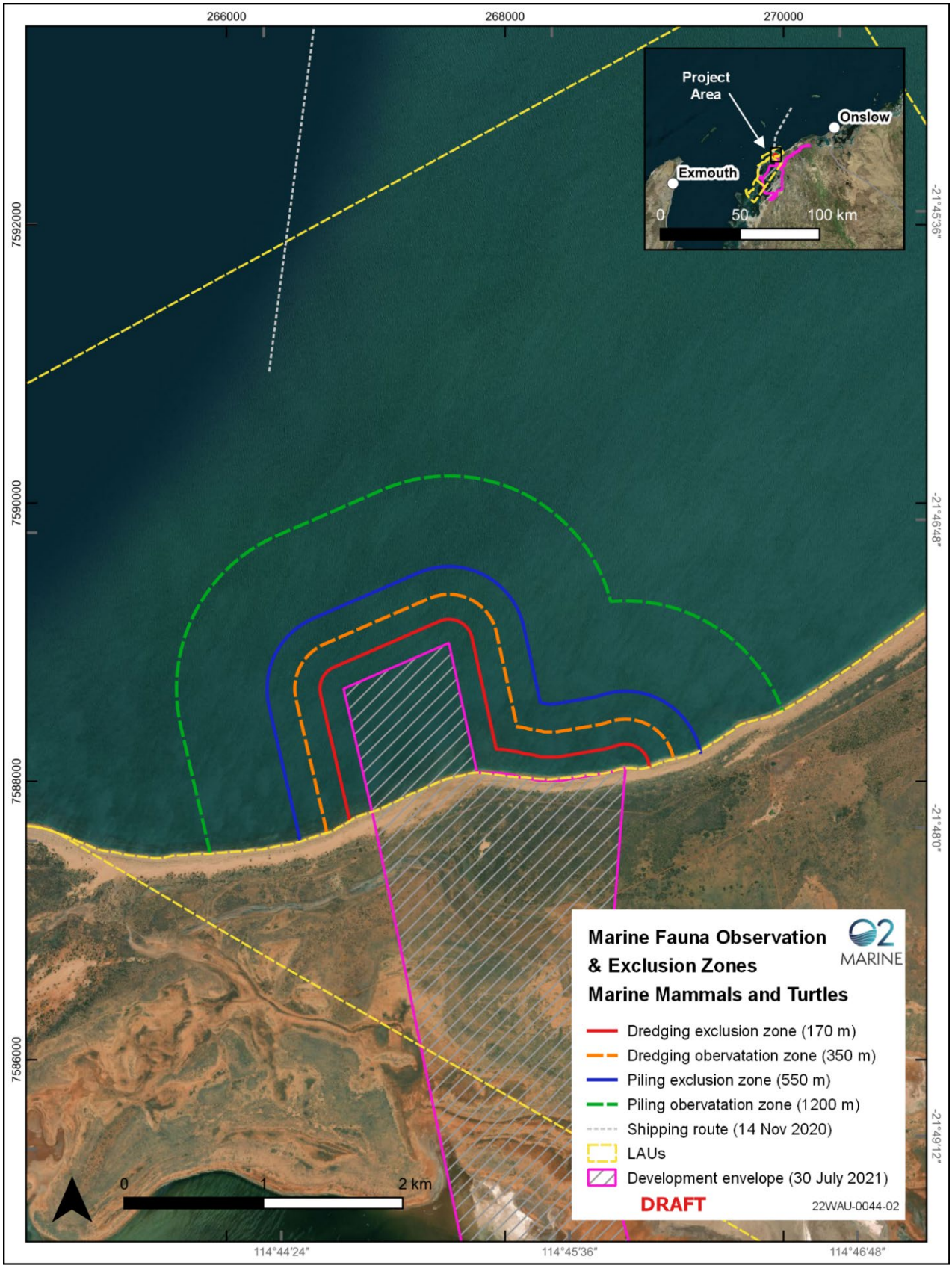

Figure 5 Observation and exclusion zones for marine mammals and turtles

Vessel Noise Management

Vessel noise and vibrations during construction and operation of the Project will be managed by implementing the following measures:

- All equipment and vessels should be operated and be maintained in accordance with appropriate industry and equipment standards including specifications for noise levels and manufacturer's specifications
- Avoid, where possible, leaving engines and thrusters in standby or running mode unnecessarily
- Regular monitoring will be conducted to assess compliance with noise and vibration levels
- Vessel captain and crew must maintain a vigilant watch for all protected marine fauna species. If protected fauna is identified within 500 m of the vessel, the operator must steer a course away from the animal at 9 kn or less until the 500 m minimum separation distance has been established.

Frequency

Marine fauna observations shall be undertaken for the duration of construction (and maintenance dredging) activities.

Location

Appropriate monitoring locations shall be selected by the MFO prior to the commencement of construction activities to ensure an unobstructed view of the exclusion zones described above (Table 15).

Records & Reporting

Field log

Trained MFOs will use pre-designed datasheets to record observer effort, fauna observations and mitigation measures. They will be based on those developed by the Australian Government to record marine fauna sightings made during seismic surveys. Datasheets will include:

- Location, date and start time of survey
- Name, qualifications and experience of MFOs involved in the survey
- Location, times and reasons for observations being affected by poor sighting conditions
- Location and time of start-up delays, power downs, or stop work procedures as a result of marine fauna sightings
- Location, time and distance of any fauna sightings including species where possible.

Reportable incidents

All contractor employees shall immediately report all environmental incidents as a non-conformance (i.e., performance indicators are not met, or management actions are not followed (Section 5.3.1) to the site supervisor who will investigate the incident with both the K+S Project Manager and Contractor Project Manager.

Reportable incidences include injury to wildlife as a result of Project activities or general observations of injured wildlife not related to Project activities, which is to be reported to the Contractor Project Manager. The Project Manager is to notify K+S, who will notify DBCA as soon as practicable (within 24 hours).

It is a requirement that all incidents follow K+S' Incident Management Procedure (Appendix B). The employee is to report the incident immediately to the site supervisor. In every case the site supervisor is to document the incident using K+S' Incident Management System (Appendix B).

Completion report

On completion of the program, the contractor will submit a completion report to K+S, which will allow compliance auditing.

The completion report will comprise:

- All logs detailing marine fauna sightings during construction of the Project
- All environmental incident reports (including injured wildlife reports).

6. Reporting

6.1. Compliance Reporting

A summary of the reporting requirements for the Project are provided in Table 16.

Table 16 Compliance reporting requirements

Report	Content	Timeframe	Responsibility	Recipient
Environmental Incidents or Environmental Risks Report	Report any environmental incident or environmental risk. Detail the incident or risk, the measures taken, the success of those measures in addressing the incident or risk and any additional proposed measures to be taken. Document any incidents involving Project 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	Contractor	K+S SoA / DoT – Reportable Oil Spill/ Pollution Report (POLREP) DBCA – Reportable wildlife incident
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	Proponent	SoA Department of Water and Environment Regulation (DWER) DCCEEW
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	K+S	SoA DWER DCCEEW

Report	Content	Timeframe	Responsibility	Recipient
Close-out Report	Evaluates the performance of monitoring and management in achieving the EPOs.	Within 12 months following completion of relevant Project activities	K+S	SoA DWER DCCEEW
HOLD: All reporting commitments under approval conditions must be included within this table				

6.2. Additional Reporting

A summary of the additional reports that are expected to inform compliance reporting commitments (Table 16) are listed in Table 17. Refer to Project activity management plans (e.g., DSMP) for specific reporting requirements associated with an activity.

Table 17 Additional reporting requirements required to demonstrate compliance

Topic	Content	Timeframe	Responsibility	Recipient
Site and vessel inspection checklists / logs	• Vessel Environment, Safety & Health inspection – (e.g., equipment inspection, navigation equipment systems, speed, MFO personnel, bunkering log). • Contractor operation log – (e.g., operations times, types of operations, GPS positioning, dredge volumes). • Marine fauna observation Logs – (e.g., activity operation time, name of observer, fauna species, distance/direction from vessel, management response).	• Daily during construction and operations.	Contractor	K+S
Pollution Incidents	All marine pollution incidents shall be reported to K+S as an environmental incident. K+S will coordinate the state reporting requirement to the DoT Maritime Environmental Emergency Response duty officer (24 hours) on (08) 9480 9924 and followed by an online POLREP Form, which is available at: http://www.transport.wa.gov.au/mediaFiles/marine/MAC-F-PollutionReport.pdf.	• All marine incidents (including pollution) to be reported to K+S immediately and to DoT within 24 hours.	Contractor K+S	K+S DoT / SoA
Complaints	K+S to be notified of any complaints received in relation to Project	• Within 72 hours of any complaint received.	Contractor	K+S

Topic	Content	Timeframe	Responsibility	Recipient
	activities. Notification should detail the nature of the complaint and how it was resolved.			

7. Availability of the MFMP

This MFMP is available on the WA EPA and K+S websites and will further be made available to the public or stakeholders upon request.

8. Audit and Review

K+S will undertake audits of all contractors and their operations (relevant to this MFMP) as required throughout the Project, to assess compliance against this MFMP. The performance of the contractor operations against these requirements will be reported to DWER/DCCEEW.

This MFMP is a live document and will be reviewed in accordance with Table 18. Any significant changes must be documented in Appendix A.

K+S is committed to continual improvement and will conduct regular review of the content and implementation of this MFMP.

Table 18 MFMP review schedule

Timing	Rationale
Upon receipt of approval conditions	Regulator (DWER/DCCEEW) approval conditions obtained will necessitate a comprehensive review of this MFMP to ensure all relevant commitments are covered within this Plan to ensure compliance.
Prior to commencement of action	To ensure that the contractor and K+S implement all commitments accordingly and that no operational details are non-compliant.
Any time operational activities significantly alter	Operational changes to the Project may result in an altered risk profile. Therefore, the MFMP will require a review to ensure that it remains fit-for-purpose for altered operational conditions. Any significant change in environmental risk will require the MFMP to be resubmitted to DWER for endorsement.
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.

9. References

AECOM (2021) Ashburton Salt Project – Ecotoxicology Assessment. Perth: Unpublished report prepared for K+S Salt Australia.

AECOM (2022) Marine Fauna Impact Assessment: Ashburton Salt Project. Prepared for K+S Salt Australia Pty Ltd.

ANCA (2005) Directory of Important Wetlands in Australia. Australian Nature Conservation Agency, last updated in 2005.

ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines.

CALM (2005) Indicative Management Plan for the proposed Dampier Archipelago marine park and Cape Preston marine management area. Department of Conservation and Land Management, Perth, Australia. 145 pp.

Commonwealth of Australia (2009) National Assessment Guidelines for Dredging. Department of the Environment, Water, Heritage and the Arts, Canberra. https://www.dcceew.gov.au/environment/marine/publications/national-assessment-guidelines-dredging-2009.

Commonwealth of Australia (2012) Marine Bioregional Plan for the North-west Marine Region. Department of Sustainability, Environment, Water, Population and Communities, Canberra. https://www.dcceew.gov.au/environment/marine/marine-bioregional-plans/north-west.

Commonwealth of Australia (2016) Draft National Strategy for Mitigating Vessel Strike of Marine Mega-fauna. Department of the Environment and Energy, Canberra. https://www.dcceew.gov.au/environment/marine/marine-species/draft-national-vessel-strike-strategy.

Commonwealth of Australia (2017a) Recovery Plan for Marine Turtles in Australia. Department of the Environment and Energy, Canberra. http://www.environment.gov.au/marine/publications/recovery-plan-marine-turtles-australia-2017. In effect under the EPBC Act from 03-Jun-2017.

Commonwealth of Australia (2017b) EPBC Act Policy Statement 3.21 – Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species. https://www.dcceew.gov.au/environment/epbc/publications/shorebirds-guidelines.

Commonwealth of Australia (2017c) Australian National Guidelines for Whale and Dolphin Watching 2017. Department of the Environment and Energy. https://www.dcceew.gov.au/sites/default/files/documents/aust-national-guidelines-whale-dolphin-watching-2017.pdf.

Commonwealth of Australia (2020) Australian Ballast Water Management Requirements: Version 8. Department of Agriculture, Water and the Environment. https://www.agriculture.gov.au/biosecurity-trade/aircraft-vessels-military/vessels/marine-pest-biosecurity/ballast/australian-ballast-water-management-requirements.

Commonwealth of Australia (2020) National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds. Department of the Environment and Energy, Canberra. https://www.dcceew.gov.au/environment/biodiversity/publications/national-light-pollution-guidelines-wildlife.

DAWE (2021a) National Conservation Values Atlas. Department of Agriculture, Water and the Environment, Canberra. http://www.environment.gov.au/webgis-framework/apps/ncva/ncva.jsf.

DAWE (2021b) Species Profile and Threats Database: Eretmochelys imbricata — Hawksbill Turtle. Department of Agriculture, Water and the Environment, Canberra. http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1766.

DAWE (2021c) Species Profile and Threats Database: Natator depressus — Flatback Turtle. Department of Agriculture, Water and the Environment, Canberra. http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=59257.

DAWE (2021d) Species Profile and Threats Database: Caretta — Loggerhead Turtle. Department of Agriculture, Water and the Environment, Canberra. http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1763.

DAWE (2022) Listing Advice *Megaptera novaeangliae* Humpback Whale. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/38-listing-advice-26022022.pdf. In effect under the EPBC Act from 26-Feb-2022. In effect under the EPBC Act from 26-Feb-2022.

DCCEEW (2020) National Conservation Values Atlas. Department of Climate Change, Energy, the Environment and Water. http://www.environment.gov.au/webgis-framework/apps/ncva/ncva.jsf.

DEWHA (2008a) Approved Conservation Advice for Green Sawfish. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/68442-conservation-advice.pdf. In effect under the EPBC Act from 07-Mar-2008.

DEWHA (2008b) The North-West Marine Bioregional Plan: Bioregional Profile. Department of the Environment, Water, Heritage and the Arts, Canberra. https://parksaustralia.gov.au/marine/management/resources/scientific-publications/north-west-marine-bioregional-plan-bioregional-profile-description-ecosystems-conservation/.

DEWHA (2009) Approved Conservation Advice for *Pristis clavata* (Dwarf Sawfish). Canberra, ACT: Department of the Environment, Water, Heritage and the Arts. Available from:

http://www.environment.gov.au/biodiversity/threatened/species/pubs/68447-conservation-advice.pdf. In effect under the EPBC Act from 20-Oct-2009.

Department of the Environment (DoE) (2015) Sawfish and River Sharks Multispecies Recovery Plan. Canberra, ACT: Commonwealth of Australia. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/recovery/sawfish-river-sharks-multispecies-recovery-plan. In effect under the EPBC Act from 07-Nov-2015.

DoEE (2018) Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans. Department of the Environment and Energy, Canberra. In effect under the EPBC Act from 21-Jul-2018.

DPIRD (2017) Biofouling Biosecurity Policy. Department of Primary Industries and Regional Development. https://www.fish.wa.gov.au/Documents/biosecurity/biofouling_biosecurity_policy.pdf.

Environment Australia (2002) Ningaloo Marine Park (Commonwealth Waters) Management Plan, Environment Australia, Canberra, Australian Capital Territory.

EPA (2016) Environmental Factor Guideline: Marine Fauna. Environmental Protection Authority of Western Australia, Perth, Western Australia.

EPA (2021a) How to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans: Instructions. Environmental Protection Authority of Western Australia, Perth, Western Australia.

EPA (2021b) Statement of Environmental Principles, Factors and Objectives and Aims of EIA. Environmental Protection Authority of Western Australia, Perth, Western Australia.

Hanf, D., Smith, J., Hodgson, A.J., Kobryn, H. and Bejder, L.B. (2022) Dolphin distribution and habitat suitability in coastal north Western Australia: Applications of a broadscale, opportunistic dataset. *Frontiers in Marine Science*, *8*(733841):1-18. doi: 10.3389/fmars.2021.733841

Hodgson, A.J., Marsh, H., Gales, N., Holley, D. and Lawler, I. (2008) Dugong population trends across two decades in Shark Bay, Ningaloo Reef and Exmouth Gulf.

Irvine, L.G. and Salgado Kent, C. (2018) The distribution and relative abundance of marine mega-fauna, with a focus on humpback whales (*Megaptera novaeangliae*), in Exmouth Gulf, Western Australia. Perth: Oceans Blueprint.

Jenner, K.C.S., Jenner, M.N.M. and McCabe, K.A. (2001) Geographical and temporal movements of humpback whales in Western Australian waters, APPEA Journal 2001: 749–765.

Loneragan, N.R., Kangas, M., Haywood, M.D.E., Kenyon, R.A., Caputi, N. and Sporer, E. (2013) Impact of cyclones and aquatic macrophytes on recruitment and landings of tiger prawns *Penaeus esculentus* in Exmouth Gulf, Western Australia. *Estuarine, Coastal and Shelf Science*, *127*, 46-58. https://doi.org/10.1016/j.ecss.2013.03.024.

McCauley, R.D. and Jenner, C. (2001) The underwater acoustic environment in the vicinity of Vincent and Enfield petroleum leases, North West Cape, Exmouth WA, Report No. R2001–22, Centre for Marine Science and Technology, Curtin University of Technology, Perth.

Morgan, D.L., Ebner, B., Allen, M., Gleiss, A., Beatty, S. and Whitty, J. (2017) Habitat use and site fidelity of neonate and juvenile green sawfish *Pristis zijsron* in a nursery area in Western Australia. *Endangered Species Research*, *34*:235–249. doi: 10.3354/esr00847

Morgan, D., Lear, K. and Norman, B (2020) Sawfish surveys Urala Creek, Exmouth Gulf, February 2019. Report to AECOM. Centre for Sustainable Aquatic Ecosystems, Harry Butler Institute, Murdoch University, Perth, Western Australia.

National Marine Fisheries Service (2016) Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing: Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Dept. of Commer., NOAA. NOAA Technical Memorandum NMFS-OPR-55, 178 p.

Noell, C., Beckmann, C., McLeay, L., Kangas, M. and Roelofs, A. (2021) Status of Australian Fish Stocks Report, Western king prawn 2020. Fisheries Research and Development Corporation.

O2 Marine (2022a) Dredging and Sediment Management Plan: Ashburton Salt Project. Prepared for K plus S Salt Australia Pty Ltd.

O2 Marine (2022b) Introduced Marine Pest Monitoring and Management Plan: Ashburton Salt Project. Prepared for K plus S Salt Australia Pty Ltd.

O2 Marine (2022c) Marine Environmental Quality Monitoring and Management Plan: Ashburton Salt Project. Prepared for K plus S Salt Australia Pty Ltd.

Pendoley Environmental (2020) Ashburton Salt: Benchmark Light Survey and Modelling. Report prepared for AECOM Australia Pty Ltd.

Talis (2021) Underwater Noise Modelling – Ashburton Salt Project. Report prepared for AECOM Australia Pty Ltd.

Threatened Species Scientific Committee (TSSC) (2008) Listing Advice for *Pristis zijsron* (Green Sawfish). Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/68442-listing-advice.pdf. In effect under the EPBC Act from 07-Mar-2008.

Threatened Species Scientific Committee (TSSC) (2001) Commonwealth Listing Advice on *Rhincodon typus* (Whale shark). Available from: http://www.environment.gov.au/biodiversity/threatened/species/r-typus.html. In effect under the EPBC Act from 16-Oct-2001.

Threatened Species Scientific Committee (TSSC) (2001) Incidental catch (bycatch) of sea turtles during coastal otter-trawling operations within Australian waters north of 28°S.

USEPA (2014) National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake Structures at Existing Facilities and Amend Requirements at Phase I Facilities;

Final Rule. Federal Register 79(158) Part II. US Environmental Protection Agency. https://www.govinfo.gov/content/pkg/FR-2014-08-15/pdf/2014-12164.pdf.

Vortex Australia (2020) Preliminary Design Report, Seawater Intake. Ashburton Salt Project. Unpublished report prepared for K plus S Salt Australia Pty Ltd.

Water Technology (2018) Seawater Intake Assessment. Memorandum prepared for K plus S Salt Australia Pty Ltd.

Water Technology (2022) Ashburton Salt Project –Marine and Coastal Assessment and Modelling. Report prepared for K plus S Salt Australia Pty Ltd.

Appendix A. Plan Amendments

Appendix A.1. Document Change Register

Table A1 - 1 MFMP document change register

Organisation	Date	Comment	Response

Appendix B. Incident Management Procedure

[HOLD: K+S to supply Incident Management Procedure when available]