Judith-2 Exploration Drilling Environment Plan

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ACRONYMS

TERM/ ACRONYM	DEFINITION
AASM	Airgun Array Source Model
AAT	Australian Antarctic Territory
ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ABS	Australian Bureau of Statistics
AEP	Australian Energy Producers
AFFF	Aqueous Film Forming Foam
AFMA	Australian Fishing Management Authority
AFZ	Australian Fishing Zone
AGR	AGR Australia Pty Ltd
AHO	Australian Hydrological Office
AHSV	Anchor Handling Support Vessels
AIATSIS	Australian Institute of Aboriginal and Torres Strait Islander Studies
AICIS	Australian Industrial Chemicals Introduction Scheme
AIS	Automatic Identification System
ALARP	As Low as Reasonably Possible
AMFA	Australian Fisheries Management Authority
AMP	Australian Marine Park
AMSA	Australian Maritime Safety Authority
ANSI	American National Standards Institute
ARS	Area Restricted Search
AS/NZS	Australian Standard/New Zealand Standard
ASAP	As Soon As Practicable
AUCHD	Australasian Underwater Cultural Heritage Database
AUSCOAST	Coastal Navigational Warnings
AUV	Autonomous Underwater Vehicle

TERM/ ACRONYM	DEFINITION
bbl	Barrel
BIAs	Biologically Important Areas
BKO	Breeding Known to Occur
BLCAC	Bunurong Land Council Aboriginal Corporation
BLO	Breeding Likely to Occur
BOP	Blow-Out Preventer
BP	British Petroleum
Bscf	Billions of standard Cubic feet of gas
CAMBA	China-Australia Migratory Bird Agreement
CD	Conservation Dependent
CE	Critically Endangered
CFA	Commonwealth Fisheries Association
CGR	Condensate Gas Ratio
CHARM	Chemical Hazard Assessment and Risk Management
CHIRP	Compressed High-Intensity Radar Pulse
CHMP	Cultural Heritage Management Plan
CKO	Congregation known to occur
CM	Control Measure
CMP	Crisis Management Plan
CMT	Crisis Management Team
CoA	Commonwealth of Australia
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CTS	Commonwealth Trawl Sector
DAFF	Department of Agriculture, Fisheries and Forestry
DAWE	Department of Agriculture Water and Environment now DCCEEW
DAWR	Department of Agriculture and Water Resources now DAFF

TERM/ ACRONYM	DEFINITION
DCCEEW	Department of Climate Change, Energy, Environment and Water
DEECA	Department of Energy, Environment and Climate Action
DELWP	Department of Environment, Land, Water and Planning
DJPR	Department of Jobs Precincts and Regions
DNP	Director of National Parks
DNRET	Department of Natural Resources and Environment Tasmania
DoD	Department of Defence
DoEE	Department of Environment and Energy
DoT	Department of Transport
DP	Dynamic Positioning
DPAC	Department of Premier and Cabinet
DPC	Department of Premier and Cabinet
DPFEM	The Department of Police, Fire and Emergency Management
DPI	Department of Primary Industries
DPIPWE	Department of Primary Industries, Parks, Water and Environment
DPIRD	Department of Primary Industries and Regional Development
DST	Drill Stem Test
DTP	Department of Transport and Planning
EAAF	East Asian - Australasian Flyway
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMBA	Environment that May Be Affected
EMPCA	Environmental Management and Pollution Control Act 1994
Emperor Energy	Emperor Energy Limited
EMS	Environment Management System
EMT	Emergency Management Team

TERM/ ACRONYM	DEFINITION
ENE	East-northeast
ENVID	Environmental Impact Identification
EOCD	Emergency and Operational Contact Directory
EP	Environment Plan
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPO	Environmental Performance Outcome
EPS	Environmental Performance Standard
ERC	Emergency Response Coordinator
ERP	Emergency Response Plan
ERR	Earth Resources Regulation
ESD	Ecologically Sustainable Development
FCAFC	Federal Circuit and Family Court of Australia.
FFG	Flora and Fauna Guarantee Act
FKO	Foraging Known to Occur
FL	Foraging Likely
FLO	Foraging Likely to Occur
FMO	Foraging May to Occur
FPSR	First Peoples State Relations
GHGs	Greenhouse Gases
GIIP	Gas Initially In Place
GLAWAC	Gunaikurnai Land and Waters Aboriginal Corporation
GRT	Gross register tonnage
H&S	Health and safety
HAZID	Hazard Identification
HDD	Horizontal Directional Drilled

TERM/ ACRONYM	DEFINITION
HLV	Heavy Lift Vessel
HMAS	Her Majesty's Australian Ship
HQ	Hazard Quotient
HSE	Health Safety and Environment
HSEMS	Health, Safety and Environment Management System
HSEQ	Health, Safety, Environment and Quality
IA	Indo-Australian
IACS	International Association of Classification Societies
IAP	Incident Action Plan
IBRA	Interim Biogeographic Regionalisation for Australia
ICEMR	Industrial Chemicals Environmental Management (Register) Act
ID	Internal Diameter
IFC	International Finance Corporation
ILUAs	Indigenous Land Use Agreements
IMCRA	Integrated Marine and Coastal Regionalisation of Australia
IMO	International Maritime Organisation
IMS	Invasive Marine Species
IMT	Incident Management Team
IOGP	International Oil and Gas Producers
IPA	Indigenous Protected Area
IPCC	Intergovernmental Panel on Climate Change
IPIECA	International Petroleum Industry Environmental Conservation Association
IPR	Inflow Performance Relationship
IR	Infrared
ISO	International Standards Organisation
ITOPF	International Tank Owners Pollution Federation

TERM/ ACRONYM	DEFINITION
IUCN	International Union for Conservation of Nature
JAMBA	Japan-Australia Migratory Bird Agreement
JASCO	Jasco Applied Sciences
JHA	Job Hazard Analysis
JRCC	Joint Rescue Coordination Centre
JSA	Job Safety Analysis
KEFs	Key Ecological Features
KO	Species Or Species Habitat Known to Occur Within Area
LALC	Local Aboriginal Land Council
LCM	Lost Circulation Material
LO	Species Or Species Habitat Likely to Occur Within Area
LOWC	Loss of Well Control
LTD	Limited
LWD	Logging While Drilling
MARPOL	International Convention for the Prevention of Pollution from Ships
MARS	Maritime and Aircraft Report System
MBES	Multibeam echo sounder
MC	Measurement Criteria
MDO	Marine Diesel Oil
MFO	Marine Fauna Observer
MKO	Migration Known to Occur within Area
MMO	Marine Mammal Observer
MMscf	Million standard cubic feet
MMSI	Maritime Mobile Service Identity
MNES	Matter of National Environmental Significance
MNP	Marine National Park

TERM/ ACRONYM	DEFINITION
MO	Marine Orders
MoC	Management of Change
MODU	Mobile Offshore Drilling Unit
MoU	Memorandum of Understanding
MP	Marine Park
MPA	State and Marine Protected Areas
MR	Migration
MRU	Marine Response Unit
MSDS	Material Safety Data Sheet
NA	Not Applicable
NAF	Non-aqueous fluids
NatPlan	National Plan for Maritime Environmental Emergencies
NCVA	National Conservation Values Atlas
NEBA	Net Environmental Benefit Analysis
NERA	National Energy Resources Australia
NGER	National Greenhouse and Energy Reporting
NMFS	National Marine Fisheries Service
NNTT	National Native Title Tribunal
NO_2	Nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOO	National Oceans Office
NOPIMS	National Offshore Petroleum Titles Administrator
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NOPTA	National offshore Petroleum Titles Administrator
NOX	Nitrous Oxides
NRDA	National Resource Damage Assessment

TERM/ ACRONYM	DEFINITION
NRE	Department of Natural Resources and Environment (Tas)
NSW	New South Wales
NTM	Notice to Mariners
NW	North-West
NZ	New Zealand
OA	Operational Area
OBP	Orange-bellied Parrot
OCNS	Offshore Chemical Notification Scheme
OCS	Offshore Constitutional Settlement
ODO	Other Odontocetes
OGUK	Oil and Gas UK
OIM	Offshore Installation Manager
OIW	Oil In Water
OPEP	Oil Pollution Emergency Plan
OPGGS Act.	Offshore Petroleum and Greenhouse Gas Storage Act 2006
OPGGS(E) Regulations	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023
OPP	Offshore Project Proposal
OSM-BIP	Operational and Scientific Monitoring Bridging Implementation Plan
OSPAR	Oslo/Paris Convention
OSTM	Oil Spill Trajectory Modelling
OSV	Offshore Support Vessel
OW	Offshore Wind
OWF	Offshore Wind Farm
OWR	Oiled Wildlife Response
P&A	Plug and Abandon
PAM	Passive Acoustic Monitoring

TERM/ ACRONYM	DEFINITION
PBC	Prescribed Body Corporate
PBW	Pygmy Blue Whale
PCPT	Piezo cone penetrometer test
PEP	Project Execution Plan
PFOS	Perfluorooctane Sulfonic Acid
PK	Peak Sound Pressure Level
PLONOR	Pose Little or No Risk to the Environment
PMS	Planned Maintenance System
PMST	EPBC Act Protected Matters Search Tool
POB	Persons on board
POLREP	Marine Pollution Report
POWBONS	Pollution of Waters by Oil and Noxious Substances Act
PSC	Port State Control
PSL	Present Sea Level
PSV	Platform Supply Vessel
PSZ	Petroleum Safety Zone
PTS	Permanent Threshold Shift
QHSE	Quality, Health, Safety, and Environment
QLD	Queensland
RAMSAR	Importance especially as Waterfowl Habitat 1971
RAP	Reconciliation Action Plan
RFFWI	Request for Further Written Information
RKO	Roosting Known to Occur within Area
RLO	Roosting Likely to Occur within Area
RMR	Riserless Mud Recovery
RMS	Root Mean Square

TERM/ ACRONYM	DEFINITION
RO	Reverse Osmosis
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
ROV	Remotely Operated Vehicle
RPS	RPS Group
SA	Southern Australia
SBP	Sub-Bottom Profiler
SC	Source Control
SCAT	Shoreline Clean-up Assessment Technique
SCE	Solids Control Equipment
SCERP	Source Control Emergency Response Plan
SDS	Safety Data Sheet
SE	South-East
SECE	Safety and Environmentally Critical Elements
SECP	Safety and Environmentally Critical Positions
SEL	Sound Exposure Level
SESSF	Southern and Eastern Scalefish and Shark Fishery
SETFIA	South East Trawl Fishing Industry Association
SFRT	Subsea First Response Toolkit
SIMAP	Spill Impact Mapping Analysis Program
SIV	Seafood Industry Victoria
SLB	Schlumberger
SMPEP	Shipboard Marine Pollution Emergency Plan
SMV	Surveillance, Modelling and Visualisation
SOLAS	Safety of Life at Sea
SOPEP	Shipboard Oil Pollution Emergency Plan
SOTS	Star of the South Wind Farm

TERM/ ACRONYM	DEFINITION
SPL	Sound Pressure Level
SRL	Southern Rock Lobster
SRW	Southern Right Whale
SS	Steam Ship
SSDI	Subsea Dispersant Injection
SSIA	Southern Shark Industry Alliance
SSS	Side-Scan Sonar
STB	Standard barrels
SW	Southwest
TAC	Total Allowable Catch
TACC	Total Allowable Commercial Catch
TAS	Tasmania
TD	Target Depth
TECs	Threatened Ecological Communities
TSIC	Tasmanian Seafood Industry Council
TSS	Total Suspended Solids
TSSC	Threatened Species Scientific Committee
TTS	Temporary Threshold Shift
UCH	Underwater Cultural Heritage
UK	United Kingdom
US	United States
USBL	Ultra-Short Baseline
UXO	Unexploded Ordnance
VFA	Victorian Fisheries Authority
VHF	Very High Frequency
Vic	Victoria

TERM/ ACRONYM	DEFINITION
VOCs	Volatile Organic Compounds
VRLA	Victorian Rock Lobster Association
VSP	Vertical Seismic Profiling
WA	Western Australia
WBM	Water-Based Mud
WCD	Worst Case Discharge
WDP	Well Delivery Process
WOMP	Well Operations Management Plan

UNITS

UNIT	DEFINITION
%	Percentage
Bscf	Billion Standard Cubic Feet
cm	Centimetre
dB	Decibel
dB re 1 μPa^2s	dB level of the time-integrated, squared sound pressure normalised to a one second period
dB re 1µPa @ 1 m	dB level of the time-integrated, sound pressure normalised at one metre
e-CO_2	Atmospheric emissions
g	Gram
g/cm^2	Gram per square centimetre
g/cm^3	Gram per cubic centimetre
g/m^2	Gram square metre
ha	Hectare
hrs	Hours
in	Inch
Ka	Kiloannum
Kg	Kilogram
kHZ	Kilohertz
km	Kilometre
Km/hr	Kilometre per hour
$ktCO_2e$	Metric Kiloton of CO_2 emissions
L	Litre
m	Meter
m/s	Meter per Second
m^2	Square meter

m^3	Cubic meter
mg/L	Milligram per Litre
mm	Millimetre
MMscf/day	Million Standard Cubic Feet per Day
$MtCO_2$-e	Metric Tons of Carbon Dioxide Equivalent
MW	Megawatt
nm	Nautical Mile
°	Degree
PK-PK	Peak to peak
ppb	Parts per billion
Psi	Pounds per Square Foot
R*max*	Maximum Horizontal Distance
SEL	Sound Exposure Level
SEL_{24h}	Sound Exposure Level over 24 Hours
SPL	Sound Pressure Level
stb/day	Stock Tank Barrel per Day
stb/MMscf	Stock Tank Barrel per Million Standard Cubic Feet
t	Tonne
UTM	Universal Transverse Mercator

1. INTRODUCTION

1.1. Project Overview

Emperor Energy Limited (Emperor Energy), as the Titleholder under *the Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) and the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023 (Cth) (referred to as the OPGGS(E) Regulations), is proposing to undertake exploration and appraisal drilling activities, for one well within its Petroleum Exploration Permit VIC/P47, in the Gippsland Basin. The Judith-2 well is being drilled on the Judith Gas Field, originally discovered in 1989 by Shell Australia.

The proposed scope of the Judith-2 Project (referred to as the Project) covered by this Environment Plan (EP) will be undertaken within the Petroleum Exploration Permit VIC/P47 and include site surveys, drilling and appraisal activities, plus plug and abandonment (P&A), herein referred to as 'the activities'. These are defined as Petroleum Activities in Regulation 5 of the OPGGS(E) Regulations and therefore, an EP is required. A detailed description of the activities is provided in Section 3.

1.2. Environment Plan Summary

The Judith-2 Exploration Well EP summary has been prepared from material provided in this EP. The summary (Table 1-1) consists of the information required by Regulation 35(7) of the OPGGS(E) Regulations.

Table 1-1: Environmental Plan Summary

EP SUMMARY MATERIAL REQUIREMENTS	RELEVANT SECTION OF EP CONTAINING EP SUMMARY MATERIALS
Details of the titleholders nominated liaison person for the activity	Section 1.5
A description of the activity	Section 3
The location of the activity	Section 3.2
A description of the receiving environment	Section 4
Details of the environmental impacts and environment	Sections 5 and 6
The control measures for the activity	Section 5
Consultation already undertaken and plans for ongoing consultation	Section 7
The arrangements for ongoing monitoring of the titleholder's environmental performance	Section 8
Response arrangements in the oil pollution emergency plan (OPEP)	Section 8.6 and with the OPEP

1.3. Purpose of the Environment Plan

In accordance with the objectives of the OPGGS(E) Regulations, the purpose of this EP is to demonstrate the:

- potential environmental impacts and risks (planned (routine and non-routine) and unplanned) that may result from the activity are identified.
- management controls are implemented to reduce impacts and risks to a level 'as low as reasonably practicable' (ALARP) and acceptable.
- activity is carried out in a manner consistent with the principles of ecologically sustainable development (ESD) (as defined in Section 3A of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* [EPBC Act]). The principles of ESD include:
  - Decision-making processes should effectively integrate both long-term and short term economic, environmental, social and equitable considerations; the 'integration principle'.
  - If there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation; the 'precautionary principle'.
  - The present generation should ensure the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations; the 'intergenerational principle'.
  - The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making; the 'biodiversity principle'.
  - Improved valuation, pricing and incentive mechanisms should be promoted; the 'valuation principle'.
  - Does not involve that activity or any part of the activity, other than emergency response arrangements for monitoring or responding to an emergency, being undertaken in any part of a World Heritage property.
- EP describes the process and resulting outputs of the risk assessment, whereby impacts and risks are managed accordingly.
- the EP provides for appropriate environmental performance outcomes (EPO), environmental performance standards (EPS) and measurement criteria.
- titleholder has carried out consultations required by Regulation 25 of the OPGGS(E) Regulations, and the measures (if any) that the titleholder has adopted or proposes to adopt because of the consultations are appropriate.

1.4. Scope of the EP

The scope of this EP covers the activities that are described in Section 3 which are within Petroleum Exploration Permit VIC/P47. The Operational Area (Section 3.2) defines the spatial boundary of the activities which are assessed in this EP. This EP considers potential environmental impacts from planned activities, contingent activities, and any unplanned risks originating from within the Operational Area. Transit to and from the Operational Area by the jack-up Mobile Offshore Drilling Unit (MODU) and support vessels, as well as port activities related to these vessels, are excluded from the scope of this EP. Activities outside of the Operational Area (e.g. transiting to and from port) are governed by applicable maritime regulations and other requirements, and are not managed by this EP.

1.5. Titleholder Details

Emperor Energy is a diversified energy company with upstream and downstream assets in Australia. The company's strategic asset is the Judith Gas Field, located in the 100% owned and operated Petroleum Exploration Permit VIC/P47 in the Gippsland Basin.

1.5.1. Titleholder

Name:	Emperor Energy Limited (Operator)
Business address:	Level 4, 55 York Street, Sydney, New South Wales (NSW) 2000
Email:	stakeholder@emperorenergy.com.au
ACN:	006 024 764

1.5.2. Nominated Liaison Person

Name:	Steven Marshall, Chief Operating Officer
Business address:	Level 50, 120 Collins Street, Melbourne, Victoria 3000
Email:	steven@emperorenergy.com.au

In the event of a change in titleholder, nominated liaison person or contact details, Emperor Energy will submit the amended details to National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA). This will reference the EP document number as well as the NOPSEMA reference and will be submitted as soon as practicable after such a change takes place as detailed in NOPSEMA's Guidance Note N-04750-GN1344 Section 3.13 (Environment Plan Content Requirement, NOPSEMA 2025).

1.6. Environmental Requirements

This section provides information on the requirements that apply to the activity and are relevant to the activity's environmental management. Requirements include relevant laws, codes, other approvals and conditions, standards, agreements, treaties, conventions, or practices (in whole or part) that apply to the jurisdiction that the activity takes place in.

Although offshore petroleum activities within the scope of this EP are located entirely in Commonwealth waters, Victorian, Tasmanian and New South Wales legislation relevant to offshore petroleum activities are described in Table 1-3, Table 1-4, and Table 1-5 on the basis that modelling indicates a worst-case credible oil spill (Section 5.9) has the potential to intersect Victorian, Tasmanian or New South Wales waters. Relevant Commonwealth requirements are summarised in Table 1-2. Recovery plans, threat abatement plans and species conservation advice relevant to the activity are detailed in Section 4.

1.6.1. Commonwealth Requirements

Table 1-2: Commonwealth Environmental Requirements Relevant to the Activity

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* enables the Australian Government to protect important Indigenous areas and objects under immediate threat, if it appears that state or territory laws have not provided effective protection. Areas or objects protected under this Act are included in the National Heritage List and Commonwealth Heritage List.	Areas or objects protected under this Act may be present within the Operational and Planning Areas as detailed in Section 5.	Department of Climate Change, Energy, the Environment and Water (DCCEEW)
Australian Ballast Water Management Requirements (CoA 2020d)	The Australian Ballast Water Management Requirements set out the obligations on vessel operators with regards to the management of ballast water and ballast tank sediment when operating within Australian seas.	Provides requirements on how vessel operators should manage ballast water when operating within Australian seas to comply with the Biosecurity Act. Section 5.2 details these requirements in relation to the management of ballast water.	Department of Agriculture, Fisheries and Forestry (DAFF)
Australia Biofouling Management Requirements (DAFF 2023)	The Australian biofouling management requirements set out vessel operator obligations for the management of biofouling when operating vessels under biosecurity control within Australian territorial seas.	Provides requirements on how vessel operators should manage biofouling when operating within Australian seas to comply with the Biosecurity Act. Section 5.2 details these requirements in relation to the management of biofouling.	DAFF
Air Navigation Act 1920	This Act and associated regulations relate to the management of air navigation.	Applies to helicopter operations during Project activities.	Department of Infrastructure, Transport, Regional Development,

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Air Navigation (Aircraft Engine Emissions) Regulations 1995 Air Navigation (Aircraft Noise) Regulations 2018			Communications and the Arts
Australian Maritime Safety Authority Act 1990	This Act facilitates international cooperation and mutual assistance in preparing and responding to a major oil spill incident and encourages countries to develop and maintain an adequate capability to deal with oil pollution emergencies. Requirements are affected through Australian Maritime Safety Authority (AMSA) who administers the National Plan for Maritime Environmental Emergencies (NatPlan).	The Act is applicable to offshore petroleum activities where these have the potential to affect maritime safety and/or result in pollution and other environmental damage associated with the operation of ships. AMSA is the designated Control Agency for oil spills with offshore petroleum activities. These arrangements are detailed in the Judith-2 Exploration Well OPEP.	Australian Maritime Safety Authority (AMSA)
Biosecurity Act 2015 Biosecurity Regulations 2016 Biosecurity Amendment (Biofouling Management) Regulations 2021	This Act is the primary legislation for the management of the risk of diseases and pests that may cause harm to human, animal or plant health, the environment and the economy. The objects of this Act are to provide for: (a) managing biosecurity risks; human disease; risks related to ballast water; biosecurity emergencies and human biosecurity emergencies; (b) to give effect to Australia's international rights and obligations, including under the International Health Regulations, the Sanitary and Phytosanitary Agreement and the Biodiversity Convention.	The Biosecurity Act and regulations apply to 'Australian territory' which is the airspace over and the coastal seas out to 12 m from the coastline. For the activity the Act and regulations regulates vessels entering Australian territory regarding ballast water and hull fouling. Biosecurity risks associated with the activity are detailed in Section 5.2.	DAFF

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Climate Change Act 2022 *Climate Change (Consequential Amendments) Act 2022*	The Act sets out Australia's greenhouse gas emissions reduction targets. It outlines Australia's greenhouse gas emissions reduction targets of a 43% reduction from 2005 levels by 2030 and net zero by 2050; requires the minister to prepare and table an annual climate change statement; requires the Climate Change Authority to give the minister advice in relation to the annual statement and future greenhouse gas emissions reduction targets; and provides for periodic reviews of the operation of the Act. The Act operates as 'umbrella' legislation to implement Australia's net-zero commitments and codifies Australia's net 2030 and 2050 GHG emissions reductions targets under the Paris Agreement.	GHG requirements are detailed in Section 5.2.1.	DCCEEW
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	This Act applies to actions that have, will have or are likely to have a significant impact on matters of national environmental or cultural significance. The Act protects Matters of National Environmental Significance (MNES) and provides for a Commonwealth environmental assessment and approval process for actions. There are eight MNES, these being: • World heritage properties • Ramsar wetlands • Listed Threatened species and communities	Petroleum activities are excluded from within the boundaries of a World Heritage Area (Regulation 21(1) and 34(f)). The activity is not within a World Heritage Area. The EP must describe matters protected under Part 3 of the EPBC Act and assess any impacts and risks to these. Section 4 describes matters protected under Part 3 of the EPBC Act. The EP must assess any actual or potential impacts or risks to MNES from the activity. Section 5 provides an assessment of the impacts and risks from the activity to matters protected under Part 3 of the EPBC Act.	DCCEEW

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
	• Listed Migratory species under international agreements • Nuclear actions • Commonwealth marine environment • Great Barrier Reef Marine Park • Water trigger for coal seam gas and coal mining developments		
Environment Protection and Biodiversity Conservation Regulations 2000	Part 8 of the regulations provide distances and actions to be taken when interacting with cetaceans.	The interaction requirements are applicable to the activity in the event that a cetacean is sighted. Section 5 details how these requirements will be applied.	DCCEEW
Environment Protection (Sea Dumping) Act 1981 Environment Protection (Sea Dumping) Regulations 1983	The Sea Dumping Act and associated regulations regulate the loading and dumping of waste at sea and the creation of artificial reefs in Australian waters. Australian waters stretch from the low-water mark of the Australian shoreline out to 200 nm	For plug and abandonment activities, removal of well infrastructure is planned and does not trigger requirements under the *Environment Protection (Sea Dumping) Act 1981*.	DCCEEW
Fisheries Management Act 1991	This Act and associated regulations protect Australia's fishery resources and establish responsibilities in ecologically sustainable development.	The Project overlaps several Commonwealth-managed fisheries, described in Section 4.8.1. Impacts and risks to Commonwealth-managed fisheries are assessed in Section 5.	AFMA DAFF
Hazardous Waste (Regulation of Exports and Imports) Act 1989	To ensure the management of Australia's hazardous waste is exported, imported and transited in an environmentally sound manner.	The Project will require permits for the export, import, or transit of hazardous waste generated during Project activities, ensuring such waste is managed in an environmentally sound manner.	DCCEEW

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Industrial Chemicals Act 2019	This Act establishes the Australian Industrial Chemicals Introduction Scheme (AICIS), regulating the importation and manufacture of industrial chemicals in Australia by requiring businesses to register, categorise their chemical introductions based on risk, maintain records, and comply with reporting obligations to ensure the protection of human health and the environment.	Where relevant, chemicals used during the Project will be considered under the requirements of this Act prior to use.	Office of Chemical Safety (OCS) under the Department of Health and Aged Care
Industrial Chemicals Environmental Management (Register) Act 2021 (ICEMR Act)	This Act establishes the Industrial Chemicals Environmental Management Standard (IChEMS) to manage environmental risks from industrial chemicals, including the IChEMS Register which lists chemicals and assigns risk management measures.	Management measures identified under IChEMS may have implications for the import and use of particular chemicals and products for the Project (e.g. firefighting foams).	DCCEEW
Marine Pest Plan 2018–2023: National Strategic Plan for Marine Pest Biosecurity (DAWR 2018)	Australia's national strategic plan for marine pest biosecurity. It outlines a coordinated approach to building Australia's capabilities to manage the threat of marine pests over the next five years. It represents agreed priorities and actions of governments, marine industries, and other stakeholders to achieve a common purpose: to manage the risks posed by marine pests and minimise their potential harm to marine industries, communities and the environment.	Applying the recommendations within this document and implementing effective biofouling controls can reduce the risk of the introduction of an introduced marine species Section 5.2.details how these requirements will be applied.	DAFF
Minamata Convention on Mercury	The Minamata Convention on Mercury is an international treaty that seeks to protect human health and the environment from anthropogenic (caused by humans) emissions and releases of mercury and mercury compounds.	Mercury may be present in drill fluid additives such as barite, bentonite, as well as cement. Section 5.2.1 details how the requirements applicable to the activity will be met.	DCCEEW

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
	The Convention covers all aspects of the life cycle of mercury, controlling and reducing mercury across a range of products, processes and industries. This includes controls on: • Mercury mining. • Manufacture and trade of mercury and products containing mercury. • Disposal of mercury waste. • Emissions of mercury from industrial facilities. Countries that have ratified the Convention are bound by international law to put these controls in place. Australia ratified the Minamata Convention on 7 December 2021		
National Biofouling Management Guidelines for the Petroleum Production and Exploration Industry (Marine Pest Sectoral Committee 2018)	The guidance document provides recommendations for the management of biofouling risks by the petroleum industry.	Applying the recommendations within this document and implementing effective biofouling controls can reduce the risk of the introduction of an introduced marine species. Section 5.2.details how these requirements will be applied.	DAFF
National Light Pollution Guidelines for Wildlife (DCCEEW 2023b)	The Guidelines outline the process to be followed where there is the potential for artificial lighting to affect wildlife.	Applying the recommendations within this document and implementing effective controls can reduce the impact of light to sensitive receptors. Section 5.2.details how these requirements will be applied.	DCCEEW

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna (CoA 2017)	The overarching goal of the strategy is to provide guidance on understanding and reducing the risk of vessel collisions and the impacts they may have on marine megafauna.	Applying the recommendations within this document and implementing effective controls can reduce the risk of the vessel collisions with megafauna. Section 5.2.details how these requirements will be applied.	DCCEEW
Native Title Act 1993 *Native Title Legislation Amendment Act 2021*	The main objects of this Act are: (a) to provide for the recognition and protection of native title; and (b) to establish ways in which future dealings affecting native title may proceed and to set standards for those dealings; and (c) to establish a mechanism for determining claims to native title; and (d) to provide for, or permit, the validation of past acts, and intermediate period acts, invalidated because of the existence of native title.	Native Title or Indigenous Land Use Agreements may be present within the Operational Area and EMBA as detailed in Section 5.	Attorney-General's Department
Navigation Act 2012	This Act regulates ship-related activities and invokes certain requirements of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) relating to equipment and construction of ships. Several Marine Orders (MO) are enacted under this Act relating to offshore petroleum activities, including: MO 21: Safety and emergency arrangements. MO 30: Prevention of collisions. MO 31: SOLAS and non-SOLAS certification.	The relevant vessels (according to class) will adhere to the relevant MO with regard to navigation and preventing collisions in Commonwealth waters. Section 5 details how these requirements will be applied.	AMSA

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
National Greenhouse and Energy Reporting Act 2007 (NGER Act)	The Act provides for the reporting and dissemination of information related to greenhouse gas emissions (GHG), greenhouse gas projects, energy production and energy consumption, and for other purposes.	GHG emissions and energy use from vessels and MODU will be reported in accordance with the requirements of the NGER Act. Applicable requirements are specified as controls to relevant impacts and risks.	Clean Energy Regulator
Offshore Petroleum and Greenhouse Gas Storage Act 2006 (OPGGS Act) Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations (OPGGS(E)R 2023)	The Act addresses all licensing, health, safety, environmental and royalty issues for offshore petroleum exploration and development operations extending beyond the three-nautical mile limit. The OPGGS(E) Regulations specifies that an EP must be prepared for any petroleum activity and that activities are undertaken in an ecologically sustainable manner and in accordance with an accepted EP.	The OPGGS Act provides the regulatory framework for all offshore petroleum exploration and production activities in Commonwealth waters, to ensure that these activities are carried out: • consistent with the principles of ecologically sustainable development as set out in section 3A of the EPBC Act. • so that environmental impacts and risks of the activity are reduced to ALARP. • so that environmental impacts and risks of the activity are of an acceptable level. Demonstration that the activity will be undertaken in line with the principles of ecologically sustainable development, and that impacts and risks resulting from these activities are ALARP and acceptable is provided in Section 5.	NOPSEMA
Offshore Petroleum and Greenhouse Gas Storage	The OPGGS Act sets out the requirements for maintenance and removal of all property. Under	The EP covers P&A of Judith-2. This EP provides an assessment against section 572 for removal of	NOPSEMA

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Act 2006 (OPGGS Act) – Maintenance and Decommissioning	subsection 572(2) of the OPGGS Act, a titleholder must maintain in good condition and repair all structure, property and equipment within a title area. Under subsection 572(3) of the OPGGS Act, a titleholder must remove from the title area all structures that are, and all equipment and other property that is neither used nor to be used in connection with the operations. Under subsection 270(3) of the OPGGS Act, before title surrender, all property brought into the surrender area must be removed to the satisfaction of NOPSEMA, or arrangements that are satisfactory to NOPSEMA must be made relating to the property.	property and section 270 of the OPGGS Act in the event of surrender of title.	NOPTA
Protection of the Sea (Prevention of Pollution from Ships) Act 1983 *Protection of the Sea (Prevention of Pollution from Ships) (Orders) Regulations 1994*	This Act and associated regulations regulate Australian regulated vessels with respect to ship-related operational activities and invokes certain requirements of the MARPOL Convention relating to discharge of noxious liquid substances, sewage, garbage, air pollution etc.	All ships involved in petroleum activities in Australian waters are required to abide by the requirements under this Act. Several Marine Orders (MO) are enacted under this Act relating to offshore petroleum activities. Section 5.details how these requirements will be applied.	AMSA
Protection of the Sea (Harmful Antifouling Systems) Act 2006	Under this Act, it is an offence for a person to engage in negligent conduct that results in a harmful anti-fouling compound being applied to or present on a ship. The Act also provides that Australian ships must hold 'anti-fouling certificates', provided they meet certain criteria.	All ships involved in offshore petroleum activities in Australian waters are required to abide by the requirements under this Act. The MO 98: Marine Pollution Prevention – Anti-fouling Systems is enacted under this Act. Section 5 details how these requirements will be applied.	AMSA

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Underwater Cultural Heritage Act 2018 (UCH Act)	Protects the heritage values of shipwrecks, sunken aircraft, relics (older than 75 years), and other types of underwater cultural heritage including Aboriginal and Torres Strait Islander underwater cultural heritage in Australian Territorial waters from the low water mark to the outer edge of the continental shelf (excluding the State's internal waterways). The Act allows for protection through the designation of protection zones. Activities / conduct prohibited within each zone will be specified.	In the event of removal, damage or interference to shipwrecks, sunken aircraft, relics, or other underwater cultural heritage including Aboriginal and Torres Strait Islander underwater cultural heritage declared to be historic under the legislation, activity is proposed with declared protection zones, or there is the discovery of shipwrecks, relics or other underwater cultural heritage. Section 4.8.5 identifies no known shipwrecks or sunken aircraft in the Operational Area.	DCCEEW
Underwater Cultural Heritage Guidance for Offshore Developments (DoEE 2019)	Provides guidance on how the Underwater Heritage Act must be considered when applying for any State, Territory or Commonwealth planning approval for actions or developments in all coastal and offshore waters.	Impacts to underwater cultural heritage from the activity have been identified as seabed disturbance and from an oil spill and associated oil spill response activities. The guidance document has been used to inform those sections.	DCCEEW

1.6.2. Victorian Requirements

Table 1-3: Victorian State Environmental Requirements Relevant to the Activity

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Aboriginal Heritage Act 2006 Aboriginal Heritage Regulations 2018	The Act acts primarily to provide for the protection of Aboriginal cultural heritage in Victoria. It does this through: • Establishing the Victorian Aboriginal Heritage Council. Council provides a state-wide voice for Aboriginal people and advises the Minister for Aboriginal Affairs on cultural heritage management. • Establishing Registered Aboriginal Parties. This allows Aboriginal groups with connections to country to be involved in cultural heritage decision making. • Establishing the Victorian Aboriginal Heritage Register. The register records details about Aboriginal places, objects, and knowledge. • Cultural Heritage Management Plans (CHMPs) and Cultural Heritage Permit processes, to manage activities that	There is the potential for aboriginal heritage and Registered Aboriginal Parties (RAP) within the Operational and EMBA. Section 5 identifies Aboriginal heritage sites and Registered Aboriginal Parties within the Operational Area and EMBA.	First Peoples State Relations

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
	may impact Aboriginal cultural heritage. • Providing sanctions and penalties to prevent harm to Aboriginal cultural heritage. • Powers for Authorised Officers and Aboriginal Heritage Officers, and increased fees and charges for breaches of the Act. The Regulations give effect to the Act. The Regulations prescribe standards, set out the circumstances in which a CHMP should be prepared and set fees and charges.		
Environment Protection Act 2017 Environmental Protection Regulations 2021	This is the key Victorian legislation that controls discharges and emissions (air, water) to the environment within Victoria (including state and territorial waters). It gives the Environment Protection Authority (EPA) powers to licence premises discharges to the marine environment, control marine discharges and to undertake prosecutions. Provides for the maintenance and, where necessary, restoration of appropriate environmental quality. The State Environment Protection Policy (Waters of Victoria) designates: • spill response responsibilities by Victorian Authorities to be undertaken in the event of spills (DTP) with EPA	Oil pollution management in Victorian State waters. Discharge of domestic ballast water from emergency response vessels into Victorian State waters must comply with these requirements. Onshore waste disposal and vessel discharges during spill response are managed as detailed in Section 6.	EPA Victoria

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
	enforcement consistent with the Environment Protection Act 1970 and the Pollution of Waters by Oil & Noxious Substances Act 1986. • requires vessels not to discharge to surface waters sewage, oil, garbage, sediment, litter or other wastes which pose an environmental risk to surface water beneficial uses. To protect Victorian State waters from marine pests introduced via domestic ballast water, ballast water management arrangements applying to all ships in State and territorial waters must be observed as per the Environment Protection (Ships' Ballast Water) Regulations 2006, Waste Management Policy (Ships' Ballast Water) and the Protocol for Environmental Management. High risk domestic ballast water (ballast water which leachates from an Australian port or within the territorial sea of Australia (to 12 nm), regardless of the source, must not be discharged into Victorian State waters. Ship masters must undertake a ballast water risk assessment on a voyage-by-voyage basis to assess risk level, provide accurate and comprehensive information to the EPA on the status and risk of ballast water contained on their ships (i.e. domestic/international), and to manage domestic ballast water discharges with EPA written approval.		

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Emergency Management Act 2013	Provides for the establishment of governance arrangements for emergency management in Victoria, including the Office of the Emergency Management Commissioner and an Inspector-General for Emergency Management. Provides for integrated and comprehensive prevention, response, and recovery planning, involving preparedness, operational co-ordination and community participation, in relation to all hazards. These arrangements are outlined in the Emergency Management Manual Victoria.	Emergency response structure for managing emergency incidents within Victorian State waters. Emergency management structure will be triggered in the event of a spill impacting or potentially impacting State waters. See OPEP.	Department of Justice and Community Safety (Emergency Management Commissioner, Emergency Management Victoria)
Fisheries Act 1995 Fisheries Regulations 2019	Provides legislative framework for the regulation, management and conservation of Victorian fisheries including aquatic habitats.	Victorian commercial and recreational fishing occur within the Operational Area and EMBA as described in Section 4.8.2.1. Impacts and risks to commercial and recreational fishing are assessed in Section 5.	Victorian Fishing Authority (VFA)
Flora and Fauna Guarantee Act (FFG Act) *1988* (and Regulations 2020)	The purpose of this Act is to protect rare and threatened species; and enable and promote the conservation of Victoria's native flora and fauna and to provide for a choice of procedures that can be used for the conservation, management or control of flora and fauna and the management of potentially threatening processes. Where a species has been listed as threatened an Action statement is prepared setting out the actions that have or need to be taken to conserve and manage the species and community.	Triggered if an incident results in the injury or death of a FFG Act listed species (e.g. collision with a whale). See incident reporting requirements in Section 8.7.3	Victoria Department of Energy, Environment and Climate Action (DEECA)

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Heritage Act 2017	The purpose of the Heritage Act is to provide for the protection and conservation of historic places, objects, shipwrecks and archaeological sites in state areas and waters (complementary legislation to Commonwealth legislation). Part 4 (Underwater cultural heritage) of the Act is focused on historic shipwrecks, which are defined as the remains of all ships that have been situated in Victorian State waters for 75 years or more. The Act addresses, among other things, the registration of wrecks, establishment of protected zones, and the prohibition of certain activities in relation to historic shipwrecks.	Section 4.8.5 identifies maritime heritage in Commonwealth and State waters. The Act may be triggered in the event of impacts to a known or previously un-located shipwreck whilst undertaking emergency response activities. Incident reporting requirements in Section 8.7.3 details reporting to Commonwealth in first instance.	Heritage Victoria Department of Transport and Planning (DTP)
Marine Safety Act 2010 Marine Safety Regulations 2023	The Act provides for safe marine operations in Victoria, including imposing safety duties on owners, managers and designers of vessels, marine infrastructure, and marine safety equipment; marine safety workers, masters and passengers on vessels; regulation and management of vessel use and navigation in Victorian State waters; and enforcement provisions of Police Officers and the Victorian Director of Transport Safety. This Act reflects the requirements of international conventions - Convention on the International Regulations for Preventing Collisions at Sea and International Convention for the Safety of Life at Sea. The Act also defines marine incidents and the reporting of such incidents to the Victorian Director of Transport Safety.	Applies to vessel masters, owners, crew operating vessels in Victorian State waters whilst undertaking emergency response activities. Vessel safe operations during the activity and/or spill response are managed as detailed in Section 6.	Safe Transport Victoria

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
National Parks Act 1975	Establishes a framework for the protection and management of national parks in Victoria. It provides for the conservation of natural and cultural resources, the provision of recreational opportunities, and the management of park use.	Triggered in the event of a spill impacting or potentially impacting marine or coastal park. Reporting requirements in the event of a spill impacting or potentially impacting State waters are detailed in the OPEP.	DEECA
Pollution of Waters by Oil and Noxious Substances Act 1986 (POWBONS) Pollution of Waters by Oil and Noxious Substances Regulations 2022	The purpose of the Pollution of Waters by Oils and Noxious Substances Act 1986 (POWBONS) is to protect the sea and other waters from pollution by oil and noxious substances. This Act also implements the MARPOL Convention (the International Convention for the Prevention of Pollution from Ships 1973) in Victorian State waters. Requires mandatory reporting of marine pollution incidents. Act restricts within Victorian State waters the discharge of treated oily bilge water according to vessel classification (> 400 tonnes); discharge of cargo substances or mixtures; prohibition of garbage disposal and packaged harmful substances; restrictions on the discharge of sewage; regulator reporting requirements for incidents; ship construction certificates and survey requirements.	Triggered in the event of a spill impacting or potentially impacting State waters. Reporting requirements in the event of a spill impacting or potentially impacting State waters are detailed in the OPEP.	Jointly administered by DEECA and EPA
Traditional Owner Settlement Act 2010	The purposes of this Act are to advance reconciliation and promote good relations between the State and traditional owners and to recognise traditional owner groups based on their traditional and cultural associations to certain land in Victoria.	There is the potential for aboriginal heritage and Registered Aboriginal Parties within the Operational and Planning Areas. Section 4.9 identifies First Nations cultural heritage within the Operational Area and EMBA.	Department of Justice and Community Safety

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Wildlife Act 1975 Wildlife Regulations 2024	The purpose of this Act is to promote the protection and conservation of wildlife. Prevents wildlife from becoming extinct and prohibits and regulates persons authorised to engage in activities relating to wildlife (including incidents). The Wildlife (Marine Mammal) Regulations 2024 prescribe minimum distances to whales and seals/seal colonies, restrictions on feeding/touching and restriction of noise within a caution zone of a marine mammal whales (300 m), (dolphins (150 m), and seals (50 m).	Applies where vessels are within State waters responding to a spill event. Prescribed minimum proximity distances to whales, dolphins and seals will be maintained if vessel undertaking spill response in Victorian waters. Triggered if an incident results in the injury or death of whales, dolphins, or seals. See incident reporting requirements in Section 8.7.3	DEECA

1.6.3. Tasmanian Requirements

Table 1-4: Tasmanian State Environmental Requirements Relevant to the Activity

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Aboriginal Heritage Act 1975	The Act is the primary legislation for the protection of Aboriginal cultural heritage in Tasmania.	There is the potential for Aboriginal heritage and values within the EMBA. Section 4.9 identifies First Nations cultural heritage within the EMBA	Department of Premier and Cabinet (DPAC)
Aboriginal Land Act 1995	The purpose of the Act is to promote reconciliation with the Tasmanian Aboriginal community by granting to Aboriginal people certain parcels of land of historic or cultural significance.	There is the potential for Aboriginal heritage and values within the EMBA. Section 4.9 identifies First Nations cultural heritage within the EMBA	DPAC
Emergency Management Act 2006	Provides for the protection of life, property and the environment in the event of an emergency, to establish emergency management arrangements, to provide for certain rescue and retrieval operation. .	Petroleum titleholders operating in or near Tasmanian State waters must prepare OPEPs. The EPA must be consulted during the development of these plans to ensure alignment with TasPlan and state environmental expectations. See OPEP.	The Department of Police, Fire and Emergency Management (DPFEM) is the primary coordinating agency for emergency management in Tasmania. Under the Tasmanian Marine Oil and Chemical Spill Contingency Plan (TasPlan), the EPA is the designated jurisdictional authority for marine pollution emergencies in State waters, including oil and noxious substance pollution events.

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Environmental Management and Pollution Control Act 1994 (EMPCA) Environmental Management and Pollution Control Regulations	EMPCA is the primary environment protection and pollution control legislation in Tasmania. It is a performance-based style of legislation, with the fundamental basis being the prevention, reduction and remediation of environmental harm. The clear focus of the Act is on preventing environmental harm from pollution and waste. Relevant regulations under the EMPCA include: • Environmental Management and Pollution Control (General) Regulations 2017 • Environmental Management and Pollution Control (Waste Management) Regulations 2010 The EPA Division Compliance Policy provides the Director of the EPA powers of compliance.	Prescribes the fee structure to waste events and environmental protection notices. Regulates the management and control of controlled wastes. See OPEP	Environmental Protection Authority (EPA) Tasmania
Historic Cultural Heritage Act 1995	The act was developed to ensure the historic places that are of importance to the whole of Tasmania are recognised, protected, and managed effectively as part of the Resource Management and Planning System.	Section 4.8.5 identifies maritime heritage in Commonwealth and State waters. Act may be triggered in the event of impacts to a known or previously un-located historical items such as shipwrecks whilst undertaking emergency response activities. Incident reporting requirements in Section 8.7.3 details reporting to Commonwealth in first instance.	Tasmanian Heritage Council

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Living Marine Resources Management Act 1995	The purpose of this Act is to promote the sustainable management of living marine resources, to provide for management plans relating to fish resources, to protect marine habitats.	Tasmanian commercial fishing occurs within the EMBA as described in Section 4.8.2.2. Impacts and risks to commercial and recreational fishing are assessed in Section 5.	NRE (Tasmania) Wild Fisheries Management Branch – Fishing Tasmania
Marine-related Incidents (MARPOL Implementation) Act 2020	Pollution of the sea in Tasmanian State waters may be regulated by general pollution laws such as the EMPCA (see above), but the Marine-related Incidents (MARPOL Implementation) Act 2020 deals specifically with discharges of oil and other pollutants from ships. It gives effect in Tasmania to the MARPOL international convention on marine pollution.	Gives effect to MARPOL in Tasmanian waters. Vessel discharges during the activity and/or spill response are managed as detailed in Section 6 and in the OPEP.	EPA Tasmania
National Parks and Reserves Management Act 2002	The Act provides for the management of parks and reserves based on management objectives of each class of reserve, declaration, and management of Marine Protected Areas (marine reserves).	Marine protected areas are identified within the EMBA (Section 4.7.1.2).	Tasmania Parks and Wildlife Service
Nature Conservation Act 2002	The purpose of the Act is to make provision with respect to the conservation and protection of the fauna, flora and geological diversity of the State, to provide for the declaration of national parks and other reserved land and for related purposes.	Marine protected areas are identified within the EMBA (Section 4.7.1.2).	Tasmania Parks and Wildlife Service

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Threatened Species Protection Act 1995	The purpose of this Act is to provide for the protection and management of threatened native flora and fauna and to enable and promote the conservation of native flora and fauna.	Identification of species that are also protected under Tasmanian legislation.	NRE (Tasmania)

1.6.4. New South Wales Requirements

Table 1-5: New South Wales State Environmental Requirements Relevant to the Activity

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Fisheries Management Act 1994	The Act is responsible for managing the NSW fishery resource with a broad objective to conserve, develop and share the fishery resources of the State for the benefit of present and future generations.	Commercial fishing activities within NSW jurisdiction overlapped by the EMBA are described in Section 4.8.2.3. Impacts and risks to commercial fishing are assessed in Section 5.	Department of Primary Industries and Regional Development (DPIRD)
Heritage Act 1977	The purpose of the Act provides for the identification, protection, promotion and conservation of items of State heritage significance (including shipwrecks within state waters) in NSW.	Underwater cultural heritage is described in Section 4.8.5. Possibly triggered in the event of impacts to a known or previously unlocated underwater heritage in NSW State waters whilst undertaking emergency response activities. Incident reporting requirements are detailed in Section 8.7.3.	Heritage Council of New South Wales
Marine Pollution Act 2012	The Act aims to protect the State's marine and coastal environment from pollution by oil and certain other marine pollutants discharged from ships.	Applies to ships involved in petroleum activities in NSW waters. Triggered in the event of a spill entering NSW state waters. Hydrocarbon spill responses of the proposed activities are described in Section 6 of this EP and OPEP.	Transport for NSW
National Parks and Wildlife Act 1974	An Act provides for the establishment, preservation and management of national parks, historic sites and certain other areas and the protection of certain Aboriginal objects.	Applicable where an oil spill poses a risk to NSW parks, reserves and fauna and flora protected under the Act. Relevant environmental and social receptors that maybe impacted by an oil spill have been identified in Section 4 of this EP.	DPIRD

LEGISLATION	SCOPE	APPLICATION TO ACTIVITY	ADMINISTERING AUTHORITY
Protection of the Environment Operations Act 1997	The purpose of the Act is to protect, restore and enhance the quality of the environment, including the marine environment.	Applicable where oil spill poses a risk to NSW state waters and coastline. Emergency response arrangements are detailed in the OPEP.	DPIRD
Wilderness Act 1987	The Act provides for the identification of wilderness and the protection and management of wilderness areas across the State while promoting education of the public.	Applicable where an oil spill poses a risk to NSW state waters and coastline protected under the Act. Relevant environmental and social receptors that maybe impacted by an oil spill have been identified in Section 4. Incident reporting requirements are detailed in Section 8.7.3.	DPIRD

2. ENVIRONMENTAL IMPACT AND RISK ASSESSMENT METHODOLOGY

The environmental impact and risk assessment methodology used for this EP is consistent with the approach outlined in the following standards:

- Emperor Energy Health, Safety and Environment Management System (HSEMS) framework.
- Australian Standard/New Zealand Standard (AS/NZS) ISO 31000:2009 Risk Management – Principles and Guidelines (Standards Australia / Standards New Zealand 2009).
- AS/NZS Handbook 203:2012 Environmental Risk Management – Principles and Process (Standards Australia / Standards New Zealand 2012).

The environmental impact and risk assessment methodology used for this EP considers impacts resulting from planned activities, and risks resulting from unplanned events. The methodology evaluates the consequence of impacts associated with planned activities on receptors and the likelihood and consequence of risks associated with unplanned events on receptors.

The methodology used to assess impacts and risks is illustrated schematically in Figure 2-1.

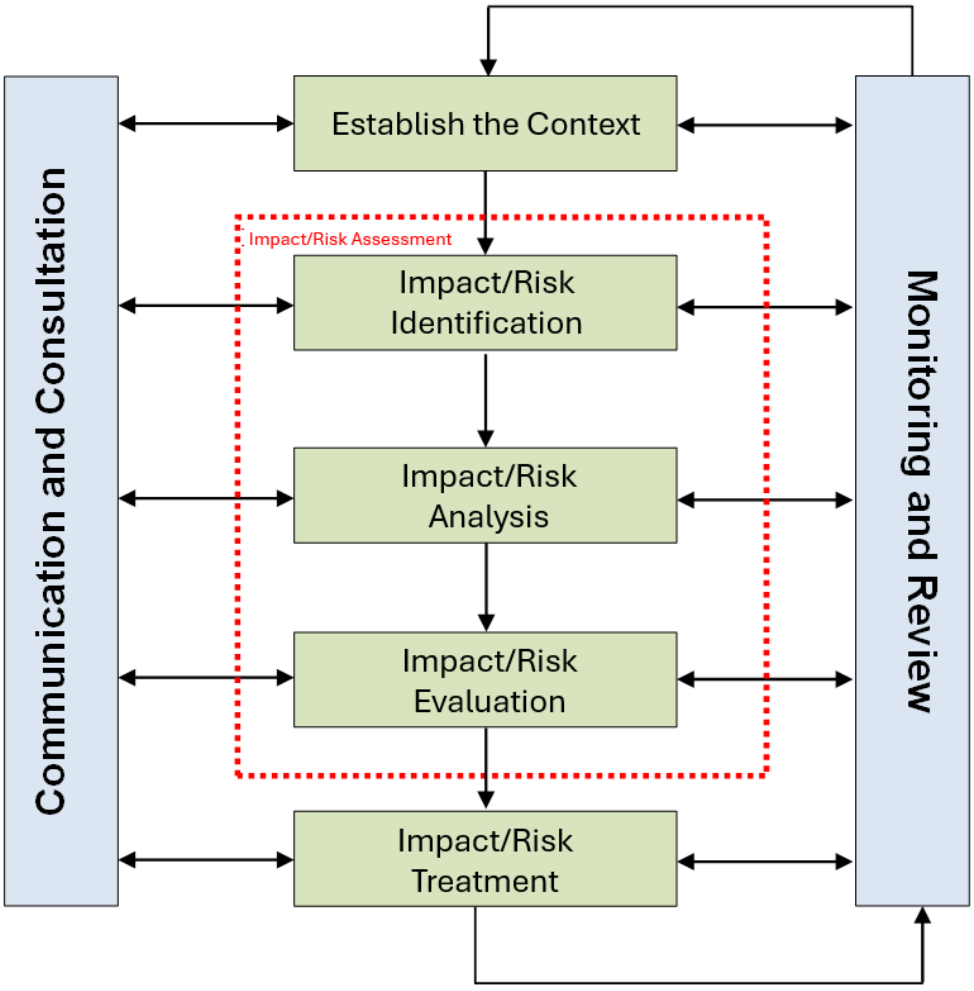


Figure 2-1: Schematic of Impact/Risk Assessment Methodology

2.1.Terminology

Throughout the impact and risk assessment process, the following terminology is used in accordance with the OPGGS(E) Regulations and standard industry practice (Table 2-1).

Table 2-1: Risk Management and Environmental Performance Terminology

TERMINOLOGY	DEFINITION
Planned Activities	Reference to 'petroleum activity' as defined under the OPGGS(E) Regulations: • Petroleum Activity: means any operations or works in an offshore area carried out for the purpose of: • exercising a right conferred on a petroleum titleholder under the Act by a petroleum title; or • discharging an obligation imposed on a petroleum titleholder by the Act or a legislative instrument under the Act. • The definition links directly to the rights conferred, or obligations imposed, on a titleholder under the OPGGS Act.
Unplanned Event	An event that is not intended to occur during the activity despite the control measures in place.
Environmental Impact	Any change to the environment, whether adverse or beneficial, that wholly or partially results from a planned activity or unplanned event.
Environmental Risk	A function of the likelihood of an unplanned event occurring and the consequence of the environmental impact.
Likelihood	The probability or frequency of an unplanned event occurring.
Severity (Consequence)	The severity of the environmental impact being realised (i.e. an impact in terms of adverse effects on the people, environment, assets or reputation).
Control Measure (CM)	As defined under the OPGGS(E) Regulations: A system, an item of equipment, a person or a procedure, that is used as a basis for managing environmental impacts and risks.
ALARP	This term refers to reducing risk to a level that is As Low As Reasonably Practicable. In practice, this means that AGR has to show through reasoned and supported arguments that there are no other practicable options that could reasonably be adopted to reduce risks further.
Acceptability	A measure of whether the impact or risk will be of an acceptable level to affected receptors. Determined from a demonstration of the ALARP principle, consistency with the principles of ecologically sustainable development (ESD) with internal context (e.g. corporate requirements), applicable state, national and international legislations; other requirements (national, international standards and best practice); and external context (e.g. consideration of relevant stakeholder consultation when determining control measures).

TERMINOLOGY	DEFINITION
Environmental Performance Outcome (EPO)	An outcome that demonstrates that the environmental performance will meet or better the acceptable level of impacts and risks of the activity.
Environmental Performance Standard (EPS)	A statement of the performance required of a control measure.
Environmental Measurement Criteria (MC)	Verification to demonstrate that the Environmental Performance Outcome and Environmental Performance Standard are being met.

2.2. Communication and Consultation

As detailed in Section 7, Emperor Energy has undertaken consultation to inform and support the impact/risk assessment of the activity in accordance with regulation 25 of the OPGGS(E) Regulations. Each relevant person was provided with sufficient information to allow the relevant person to make an informed assessment of the possible consequences of the activity on their functions, interests or activities as per regulation 25(2) of the OPGGS(E) Regulations.

2.3. Establish the Context

The context of the impact and risk assessment has been set through the description of the activity (Section 3) and identification of potential environmental receptors within the Operational Area and EMBA (Section 4). By considering the interactions between environmental aspects and the activity (Table 5-1), Emperor Energy has identified all impacts and risks to receptors which could potentially occur from the activity.

2.4. Identification and Analysis of Impacts and Risks

Impacts and risks resulting from the interactions between environmental aspects and the activity (Table 5-1), were identified at the project Environmental Impact Identification (ENVID) workshop and analysed further outside of the workshop where necessary to reduce uncertainty.

A further review of the ENVID was completed in September 2025 to reflect the removal of some operational aspects. The ENVID was attended by Emperor Energy's Chief Operating Officer (COO), (Acting) Chief Executive Officer, AGR's Project Manager, HSE & Regulatory Specialist, Xodus' Environmental Project Manager, Lead Environmental Consultant, Environmental Consultant and Stakeholder Engagement Specialist.

During the ENVID, planned impacts and unplanned risks are also identified and assigned levels of consequence and risk, respectively. Such that for:

- Planned environmental impacts, only the severity (i.e. consequence) of the impact is analysed and ranked using the descriptors in Table 2-2.
- Unplanned risks, the severity of the impact and likelihood of the unplanned event's occurrence are analysed and ranked. The unplanned risk rating is determined from the combination of the likelihood and the expected severity (i.e. consequence). Risks are rated using the Qualitative Risk Matrix (Figure 2-2) with a 'severity' ranking of 1 (slight) to 5 (catastrophic) and a 'likelihood' ranking of A (rare) to E (almost certain).

It is noted that analysis and ranking of planned environmental impacts and unplanned risks are assessed considering standard industry controls and legislative requirements are in place.

Table 2-2: Severity Categories and Descriptors

SEVERITY/ CONSEQUENCE LEVEL	ENVIRONMENT SEVERITY DESCRIPTOR	IMPACT ACCEPTABILITY	SEVERITY/ CONSEQUENCE LEVEL
5 - Catastrophic	Massive effect: environmental impact could last for decades; long term contamination requiring remediation.	Unacceptable	Not meeting legal, community or stakeholder requirements and expectations or Emperor Energy standards. Impact not acceptable based on severity and the planned event leading to the impact.
4 - Major	Major effect: environmental impact could last for years; area becomes restricted for a limited period of time.	Unacceptable	Not meeting legal, community or stakeholder requirements and expectations or Emperor Energy standards. Impact not acceptable based on severity and the planned event leading to the impact.
3 - Severe	Severe effect: environmental impact could last for months; reportable quantity spill or release; spill or release requires clean-up.	Unacceptable	Impact not acceptable and the planned activity leading to the impact cannot progress without additional long-term impact reduction measures. Increased resources and management focus required to ensure impact reduced to ALARP and an acceptable level.
2 - Minor	Minor effect: environmental impact could last for weeks; spill or release external to facility; no clean-up required.	Acceptable with impacts managed via the Company's Management Systems and ALARP demonstrated.	Impact is acceptable if reasonable safeguards/management systems are confirmed to be in place, where it has been demonstrated as being ALARP and of an acceptable level.
1 - Slight	Slight effect: environmental impact could last for days; no long-term consequences; spill or release internal to facility.	Acceptable, with impacts managed via the Company's Management Systems and ALARP demonstrated.	Impact is generally regarded as acceptable by a broad range of stakeholders. Adequate resources and management focus to ensure impact are ALARP and of an acceptable level.

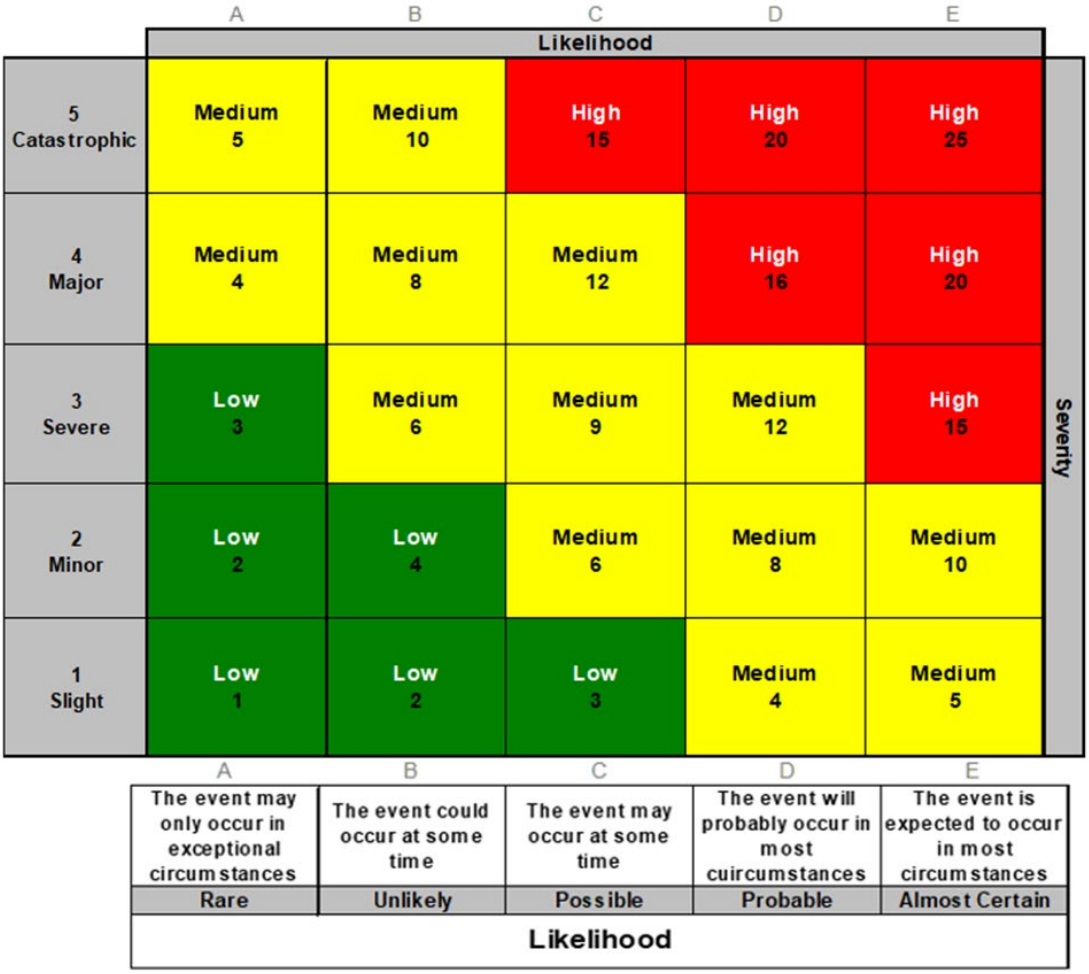


Figure 2-2: Qualitative Risk Matrix

2.5.Evaluation of Impacts and Risks

Identified impacts and risks are framed as either a "Lower Order Impact" or a "Higher Order Impact". All impacts and risks are evaluated at the lower level until one or more factors trigger the impact to be evaluated at a higher level. These factors are:

- Uncertainty in the impact or risk assessment which requires further analysis, for example where modelling is required to understand the nature and scale of an impact.
- ALARP decision context B and above (refer to Section 2.6.1).
- Residual Risk Severity *Moderate* and above (refer to Section 2.4).
- Planned environmental impact consequence equal to or greater than *Severe* (refer to Section 2.4)
- Stakeholder concerns (Section 2.2).

Higher order impacts require a higher order of evaluation, as described in the NOPSEMA Environment Plan Decision Making Guideline (N-04750-GL1721 A524696 January 2024).

2.6. Treatment of Impacts and Risks to ALARP

A key objective of the environmental impact and risk assessment method is to identify the appropriate control measures to reduce the impacts and risks of the activity to ALARP and to an acceptable level.

Regulation 21(5) of the OPGGS(E) Regulations requires that the EP must demonstrate that the environmental impacts and risks of the activity will be reduced to ALARP. It is noted that standard industry controls and legislative requirements will treat all impacts and risks of the activity. If the impact or risk cannot be demonstrated to be ALARP, additional reasonably practicable measures must be considered to further reduce the impact or risk. The method for ALARP demonstration for each impact and risk is defined in Section 2.6.1.

2.6.1. ALARP Demonstration

For an activity to be considered ALARP, the EP must demonstrate, through reasoned and supported arguments, that there are no other practicable control measures that could reasonably be implemented to reduce the environmental impacts and risks of the activity.

The key principles underpinning the ALARP principle include:

- There are no reasonably practicable alternatives to the activity.
- There are no additional reasonably practicable measures available to further reduce the risk or impact.
- The sacrifice (cost, time, effort) for implementing further control measures is grossly disproportionate to the reduction in risk or impact and the environmental benefit gained.

In alignment with NOPSEMA's ALARP Guidance Note (N-04300-GN0166, October 2025), Emperor Energy has adapted the approach developed by Oil and Gas UK (OGUK) (OGUK, 2014) for use in an environmental context to determine the assessment technique required to demonstrate that potential impacts and risks are ALARP (Figure 2-3). Specifically, the framework considers impact severity and several guiding factors:

- Activity type.
- Risk and uncertainty.
- Stakeholder influence.

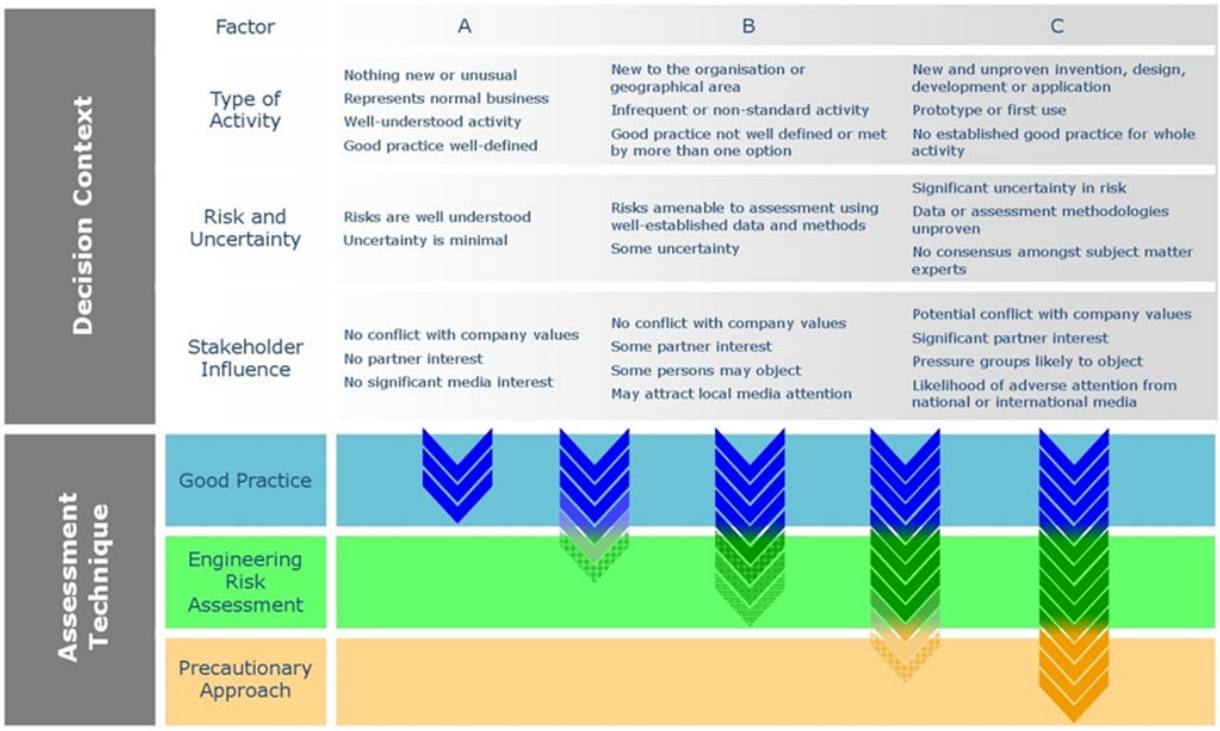


Figure 2-3: ALARP Decision Support Framework (Oil & Gas UK 2014)

A Type A decision is made if the risk is relatively well understood, the potential impacts are low, activities are well practised, and there are no conflicts with company values, no partner interests, and no significant media interests. However, if good practice is not sufficiently well-defined, additional control measures are then considered, as required.

A Type B decision is made if there is greater uncertainty or complexity around the activity and/or risk, the potential impact is moderate, and there are no conflicts with company values, although there may be some partner interest, some persons may object, and it may attract local media attention. In this instance, established good practice is not considered sufficient and additional control measures and further assessment is required to support the decision and ensure the risk is ALARP.

A Type C decision typically involves sufficient complexity, high potential impact, uncertainty, or stakeholder influence to require a precautionary approach. In this case, relevant good practice still must be met, additional control measures and additional assessment is required, and the precautionary approach applied for those controls that only have a marginal cost benefit.

In accordance with the regulatory requirement to demonstrate that environmental impacts and risks are ALARP, Emperor Energy has considered the above decision context in determining the level of assessment required. This is applied to each aspect described in Section 5.

The assessment techniques considered include:

- Good practice.
- Engineering risk assessment.
- Precautionary approach.

2.6.1.1. Good Practice

OGUK (2014) defines 'Good Practice' as:

The recognised risk management practices and measures that are used by competent organisations to manage well-understood hazards arising from their activities.

'Good Practice' can also be used as the generic term for those measures that are recognised as satisfying the law. For this EP, sources of good practice include:

- Requirements from Australian legislation and regulations.
- Relevant Australian policies.
- Relevant Australian Government guidance.
- Relevant industry standards.
- Relevant international conventions.

If the ALARP technique is determined to be 'Good Practice', further assessment ('Engineering Risk Assessment') is not required to identify additional controls. However, additional controls that provide a suitable environmental benefit for an insignificant cost are also identified at this point.

2.6.1.2. Engineering Risk Assessment

All potential impacts and risks that require further assessment are subject to an 'Engineering Risk Assessment'. Based on the various approaches recommended in OGUK (2014), Emperor Energy believes the methodology most suited to this activity is a comparative assessment of risks, costs, and environmental benefit. A cost–benefit analysis should show the balance between the risk benefit (or environmental benefit) and the cost of implementing the identified measure, with differentiation required such that the benefit of the risk reduction measure can be seen and the reason for the benefit understood.

2.6.1.3. Precautionary Approach

OGUK (2014) state that if the assessment, considering all available engineering and scientific evidence, is insufficient, inconclusive, or uncertain, then a precautionary approach to impact and risk management is needed. A precautionary approach will mean that uncertain analysis is replaced by conservative assumptions that will result in control measures being more likely to be implemented.

That is, environmental considerations are expected to take precedence over economic considerations, meaning that a control measure that may reduce environmental impact is more likely to be implemented. In this decision context, the decision could have significant economic consequences to an organisation.

2.7.Acceptability Determination

Regulation 34(c) of the OPGGS(E) Regulations requires that the EP demonstrates that the environmental impacts and risks of the activity will be of an acceptable level. The Acceptable level of impacts and risks is considered for each receptor potentially affected.

The Acceptable level of impact or risk is determined for each receptor, based on the values and sensitivities of that receptor in the Operational Area or EMBA relevant to this EP. Acceptable level of impact or risk considers several important factors, including sensitivity of the receptor at the location (e.g. BIAs, critical habitats, protected areas), vulnerability of the receptor to change (i.e. is the receptor particularly vulnerable

to disturbance events) and timing of the activity (i.e. does the activity timings correspond to any important behaviours).

The Acceptable level of impact or risk is compared against the predicted level of impact / risk resulting from the activity, as determined during the impact and risk assessment, to determine Acceptability of the impact or risk. The impact and risk ratings are aligned with impact/risk tolerance and associated response guidance to manage or to reduce to impact/risk ALARP and acceptable levels as described in Table 2-3.

Table 2-3: Impact and Risk Rating Tolerance

IMPACT RATING	RISK RATING	TOLERANCE	DEFINITION AND RESPONSE
Severe, Major or Catastrophic	High	Intolerable (Unacceptable)	If the impact rating is equal to or greater than Severe and the risk rating is High, is the impact/risk is intolerable and unacceptable. If the impact and risk rating remain intolerable, once all available controls have been identified, the task must not be undertaken. Further review, consultation and risk assessment is required.
Minor	Medium	Tolerable (Acceptable)	Minor impacts and Medium risks are considered tolerable and acceptable. Efforts should still be made to identify additional control measures (if any) that are not disproportionate to the benefit gained, to demonstrate the levels are reduced to ALARP.
Slight	Low	Acceptable	Slight impacts and Low risks are considered acceptable. If an impact or risk is acceptable, this does not necessarily preclude the initiation of improvements if they are economic, readily identified, and practicable. If a readily available control measure will further reduce the impact or risk and the cost of implementation is not disproportionate to the benefit gained, then it is considered 'reasonably practicable' and is implemented.

In the context of 'Acceptability' several elements need to be considered, in addition to comparing impact and risk ratings to tolerance levels. In this EP, the environmental impacts and risks associated with the activity are determined 'Acceptable' if the impact and risks are tolerable and the following criteria are met:

- Principles of Ecologically Sustainable Development (ESD): The activity (and associated potential risks and impacts) will not contravene the Principles of ESD, as described in Section 3A of the EPBC Act. For planned (routine) events, this is achieved when residual environmental impacts are considered 'Minor' or 'Slight'. For unplanned (i.e. accident/incident) events, this is achieved when residual environment risks

are considered 'Medium' (Tolerable), or 'Low' (Acceptable). With scientific certainty, these impact and risk ratings confirm there is no potential for serious or irreversible damage to the environment. If the impact and risk evaluation identified scientific uncertainty, the precautionary principle will be implemented.

- Internal Context: The activity (and associated potential risks and impacts) to the environment is consistent with Emperor Energy corporate policies, standards, and procedures.
- External Context: Stakeholder objections or claims related to the activity (and associated potential risks and impacts) have been considered and addressed through the consultation process.
- Other Requirements: The activity (and associated potential risks and impacts) to the environment is consistent with relevant legislation, industry standards and guidelines, offshore practice or benchmarking.

2.8. Environmental Performance

Adopted controls measures used to reduce impacts/risk to ALARP and acceptable levels. The establishment of EPO, EPS and their associated MC will ensure the outcome of the activity is acceptable. The establishment of defined EPOs, EPSs and MCs will consider legal requirements, relevant guidelines, and stakeholder views. EPOs, EPS, and their associated MC are described in Section 5.

2.9. Monitoring and Review of Impacts and Risks

Continuous impact and risk monitoring and review is essential because the environment, potential impacts/risks and treatment of impacts/risks are dynamic, and the activity may be subject to change. Regular monitoring and review of impacts/risks and controls provides assurance that the assessment of impacts and risks in this EP continue to be ALARP and Acceptable.

Section 8.10.2 lists relevant changes that trigger routine review and assessment of impacts and risks assessed in this EP, including adjustments approved work programs, new information or information changes from research, stakeholders, legal and other requirements, and any other sources used to inform internal processes, procedures or decisions.

3. DESCRIPTION OF THE ACTIVITY

3.1. Overview

This section has been prepared in accordance with Regulation 21 of the OPGGS(E) Regulations, and describes the activities to be performed as part of the EP. It includes the location and timing of the activities and operational details. The proposed scope of activities within the Operational Area (detailed in Section 3.2), covered by this EP consist of:

- Geophysical survey
- Geotechnical survey
- Drilling of one exploration well (Judith-2), which will be Plugged & Abandoned (P&A) post-drilling and testing.

The scope of this EP does not include:

- Vessels transiting to or from the Operational Area. These vessels are deemed to be operating under the *Commonwealth Navigation Act 2012* and not performing a petroleum activity whilst outside the Operational Area.
- Mobilisation of a jack-up mobile offshore drilling unit (MODU) into Australian Commonwealth waters and Victorian State waters, and associated biosecurity and ballast water management prior to the arrival of the MODU into the Operational Area. The MODU is subject to biosecurity control on entering Australian territory (12 nm offshore) in accordance with the *Biosecurity Act 2015*. Ballast water must be managed in accordance with the Australian Ballast Water Management Requirements Rev 8. Both biosecurity and ballast water management are administered by the Commonwealth Department of Agriculture, Water and Environment (DAWE).

The activity described within this EP has been refined through the project planning process. Updates are the result of stakeholder consultation, technical limitations and findings from the environmental impact and risk assessment. The description of the activity presented in the EP incorporates all updates resulting from these refinements. Any future modifications to the activity will be managed in accordance with Emperor Energy's Management of Change (MoC) Standard (Section 8.10).

Any future development drilling and subsea installation activities associated with the well would be covered under subsequent environmental approvals.

3.2. Operational Area and Location

The activity will be located in Commonwealth waters, approximately 36 km south of Marlo, Victoria. The Operational Area is defined as a 4 km by 4 km area within VIC/P47, within which all planned petroleum activities will occur. It comprises two distinct sub-activity areas:

- Survey Area: the 4 km × 4 km Operational Area where geophysical and geotechnical surveys will be undertaken
- Drilling Area: the location of the Judith-2 well and its surrounding 500-m radius petroleum safety zone (PSZ), within which the jack-up MODU will be positioned and drilling activities will occur.

The vessels transiting to or from the Survey Area or Drilling Area during relevant activities are deemed operating under the Commonwealth *Navigation Act 2012* and not performing a petroleum activity.

The final well location for the Judith-2 exploration well will depend on the outcomes and analysis of seabed surveys which are planned for early 2026 (Section 3.4), subject to vessel availability. Emperor Energy will finalise the well location based on the data obtained from the surveys which include the identification of any sensitivities or hazards on the seabed such as unexploded ordnance (UXO), important benthic habitats, underwater cultural heritage and archaeological sites. Indicative coordinates for the Judith-2 well are presented in Table 3-1 and Figure 3-1. The final well location will remain within the defined Operational Area such that the 500 m PSZ around the well remains entirely within the Operational Area boundary, in accordance with the Offshore Petroleum and Greenhouse Gas Storage Act 2006. The PSZ will remain in place for the life of the well, or until revoked. The Operational Area, indicative Judith-2 well location and PSZ are shown in Figure 3-1. The coordinates of the Operational Area are provided in Table 3-1.

Table 3-1: Indicative Location of the Judith-2 Exploration Well

WELL	LATITUDE (GDA94)	LONGITUDE (GDA94)	EASTING (MGA55)	NORTHING (MGA55)	WATER DEPTH
Judith-2	38° 09′ 6.7644″ S	148° 33′ 19.6692″ E	636287.4	5776190.5	~76 m

Table 3-2: Operational Area Coordinates

POINT	LATITUDE (GDA94)	LONGITUDE (GDA94)	EASTING (MGA55)	NORTHING (MGA55)
NW Corner	38° 07' 27.0688" S	148° 30' 58.3214" E	632897.3	5779320.4
NE Corner	38° 07' 24.9169" S	148° 33' 42.5529" E	636897.3	5779320.4
SE Corner	38° 09' 34.6512" S	148° 33' 45.3198" E	636897.3	5775320.4
SW Corner	38° 09' 36.8059" S	148° 31' 01.0076" E	632897.3	5775320.4

3.3.Activity Timeframe

3.3.1. Design Envelope

The design envelope is the broadest timeframe within which all activities can occur. To account for any schedule delays (i.e. potential weather, operational issues), activities may occur at any time or season throughout the proposed period of 1 January 2026 to 31 December 2027. Activities will be conducted on a 24 hour per day, 7 days per week basis, as is commonplace in the Gippsland Basin and for offshore surveying, drilling and testing activities.

3.3.2. Operating Envelope

The operating envelope is the maximum anticipated timeframe planned to complete the activities. Site surveys within the Operational Area are expected to take up to 9 days, consisting of:

- Geophysical survey - 4 days

- Geotechnical survey - 5 days

Site surveys are expected to be continuous, however may be interrupted, paused or delayed due to weather delays or contractor downtime. The site surveys will likely be completed 1-8 months prior to drilling activities. The geophysical and geotechnical surveys will be undertaken separately, by different vessels and at different times.

Drilling activities on Judith-2 are expected to take up to 60 days (including positioning, testing, P&A activities) within the Operational Area. Drilling is expected to be continuous, however may be interrupted due to weather delays and contractor downtime. The mobilisation of the MODU and commencement of activities is dependent on the release of the MODU by its previous operator. Concurrent activities from geophysical, geotechnical survey and drilling activities are not expected due to the technical requirements of each scope.

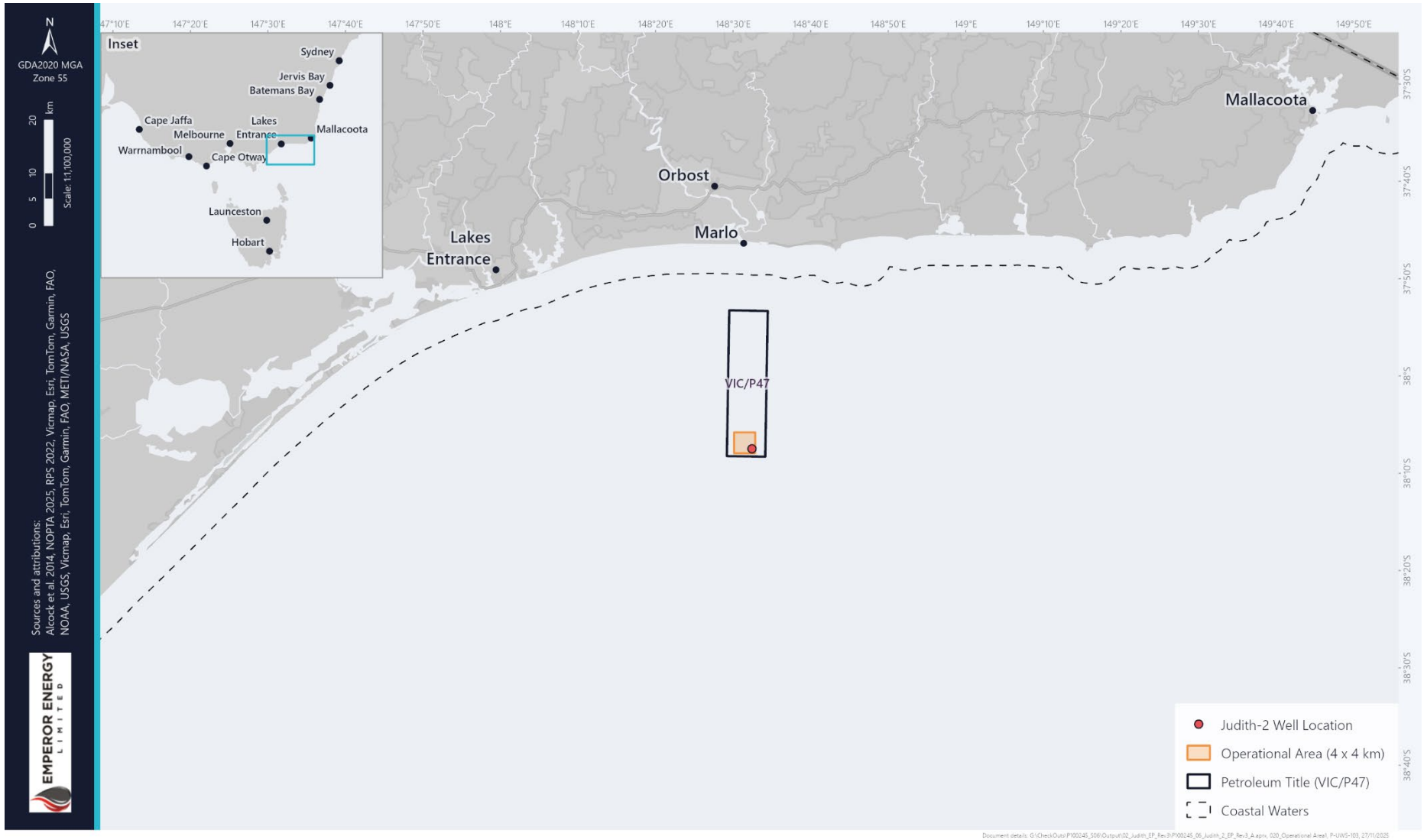


Figure 3-1: Judith-2 Indicative Well Location and Operational Area

3.4.Site Surveys

Geophysical and geotechnical site surveys will be conducted prior to drilling the Judith-2 exploration well. The objective of these surveys is to assess obstructions and hazards at and below the seabed, including:

- Bathymetry
- Seafloor geologic hazards including fault scarps, gas vents, hydrate mounds, unsuitable slopes, slumping, active mud gullies (crown cracks, collapsed depressions, furrows, sinkholes, surface channels and reefs)
- Subsurface geologic hazards including faults, gas-charged sediments, shallow water flow and buried channels
- Manmade hazards including pipelines, wellheads, shipwrecks, ordnance, communication cables, remnant MODU leg-holes and debris
- The state of the seabed at the well location, MODU support leg locations and potential relief well location.

Survey vessels will travel at approximately 4-5 knots (7-9 km/hr) during geophysical survey activities and will be stationary during geotechnical activities. The survey vessels may hold station using dynamic positioning (DP) or propellers as water depths are too deep for anchoring (~74 m). All refuelling and crew mobilisation will occur at port. Survey vessel specifications are detailed in Section 3.7.2.

3.4.1. Geophysical Survey

A description of the proposed geophysical survey activities and equipment are provided in Table 3-3. The geophysical survey campaign will be based on a two phased approach: with the first phase to survey the Operational Area (4 km x 4 km over the well location) and then the second phase to survey the centralised targeted area (1 km x 1 km over the well location).

The first phase of the geophysical survey is to identify seabed hazards using the following techniques (applied using typical line spacing consisting of nominal 100 m spaced primary lines with crosslines spaced at 500 m):

- Multi-beam echo sounder (MBES)
- Side-scan sonar (SSS)
- Sub-bottom profiler (SBP)
- Magnetometer
- Ultra-Short Baseline (USBL) Positioning System

The second phase of the geophysical survey is to undertake a detailed survey centralised over the well location by undertaking a high resolution two-dimensional (2D) shallow reflective imaging technique (applied using line spacings of 100 m and 40 m to inform shallow gas hazards), herein termed the 2D survey.

3.4.2. Geotechnical Survey

A description of the proposed geotechnical survey activities is provided in Table 3-3. The geotechnical survey is required to determine shallow and surface geology / sediments and verify geophysical survey

interpretations. Geotechnical surveys comprise of in-situ testing and recovery of sediment samples consisting of:

- Coring
- Piezo cone penetrometer test (PCPT)
- Grab samples

Collected sediments will be photographed, described and tested to determine the seabeds load bearing properties at the potential MODU location and to validate the results of the geophysical survey.

Table 3-3: Geophysical and Geotechnical Survey Activities

EQUIPMENT	PURPOSE	ACTIVITY DETAILS
Geophysical survey		
Multi-beam echo sounder (MBES)	Measure bathymetry.	A MBES mounted on the vessel hull is likely to be used. A MBES acquires a wide swath (strip) of bathymetry data perpendicular to the vessel track and provides total seabed coverage with no gaps between vessel tracks. A MBES transmits a broad acoustic pulse from a transducer over a swath across a vessel track. The MBES then forms a series of received beams that are each much narrower and form a 'fan' (with a half-angle of 30-60°) across the seabed, perpendicular to the vessel track. The transducer(s) then 'listen' for the reflected energy from the seabed. The fans of seabed coverage produce a series of strips along each track, which are lined up side-by-side to generate two-dimensional georeferenced bathymetric maps of the seabed.
Side scan sonar (SSS)	Detects hazards such as existing pipelines, lost shipping containers, boulders, debris, unmarked wrecks, reefs and craters.	The SSS method of surveying generates acoustic images of the seabed by towing a sonar 'towfish'. The towfish is provided with power and digital telemetry services and towed from the vessel using a reinforced or armoured tow cable. The towfish is equipped with a linear array of transducers that emit, and later receive, an acoustic energy pulse in a specific frequency range. Typically, a dual-channel, dual-frequency SSS is used. SSS is like MBES but operates at a wider fan angle. The acoustic energy received by the towfish (backscatter) provides information as to the general distribution and characteristics of the surficial sediment and outcropping strata. Shadows result from areas of no energy return, such as shadows from large boulders or sunken ships, and aid in interpretation of the sonogram image. The towfish is constructed of stainless steel and is a cylindrical torpedo-like device. Itis typically towed 10-15 m above the seabed depending on water depth and the frequency range. The SSS is operated at the same time as the MBES.

EQUIPMENT	PURPOSE	ACTIVITY DETAILS
Sub-bottom profiler (SBP)	Investigate the layering and thickness of the uppermost seabed sediments.	**CHIRP** Very high frequency systems including pingers, parametric echo sounding and CHIRP – produce a swept-frequency signal. CHIRP systems usually employ various types of transducers as the source. The transducer that emits the acoustic energy also receives the reflected signal. CHIRP signals typically penetrate only about 5-10 m into the seabed and provide the best resolution, but lowest penetration. A CHIRP is normally hull mounted when used for shallow water operations but may also be towed in a similar fashion to the SSS. **High-frequency boomers** High frequency boomers generate a broadband, high amplitude impulsive acoustic signal in the water column that is directed vertically downward. Boomers are mostly surface towed but may also be towed below the surface to avoid sea surface wave related noise and movement. The receiver for the boomer system is usually a hydrophone or hydrophone array consisting of a string of individual hydrophone elements. They typically contain eight to 12 hydrophone elements evenly spaced in a tube that is 2.5 to 4.5 m in length and 25 mm in diameter. The SBP system is towed and operated at the same time as the MBES and SSS. The SBP survey is likely to be undertaken in two passes in conjunction with the MBES and SSS.
Magnetometer	Detect metallic objects on or below the seabed	A magnetometer sensor is housed in a towfish and is towed as close to the seabed as possible and sufficiently far away from the vessel to isolate the sensor from the magnetic field of the vessel. The magnetometer survey will be conducted at the same time as the MBES, SSS and SBP. The magnetometer towfish is constructed of stainless steel and is a cylindrical torpedo-like type device.
Ultra-Short Baseline (USBL) Positioning System	Positioning of towfish in water depths up to 3,000 m.	The side scan sonar towfish and geotechnical equipment are positioned utilising ultra-short baseline (USBL) methods. It is necessary to calibrate the transceiver, which is usually deployed on retractable pole under the vessel, or over the side. The calibration requires a transponder to be deployed on the sea floor, at working depth and the vessel; surveys a pattern around the transponder to ascertain the error (pitch, roll, heading & velocity) of the USBL transceiver. The

EQUIPMENT	PURPOSE	ACTIVITY DETAILS
		transponder is lowered to the seabed and once the calibration is complete, the USBL transponder is recovered. As the calibration must be completed at working depth and close passes are required it is impractical to buoy the transponder. However, the USBL and all associated equipment will be recovered. The USBL frame typically covers an area of <2 m^2.
High resolution 2D shallow reflective imaging (2D survey)	Identify shallow gas hazards.	The 2D survey will consist of a sound source and receiver to identify shallow gas. Equipment will consist of a single sound source using compressed air to create a pulse of acoustic energy with a volume of up to 160 in^3, towed at a depth of approximately 1-3 m and with a streamer length between 150 and 1,500 m. For the 2D survey, the vessel will traverse a series of pre-determined sail lines spaced at approximately 100 m, at a speed of approximately 7-9 km/hr (4 – 5 knots). As the vessel travels along the sail lines a series of sound pulses (approximately every 2-6 seconds) are directed through the water column towards the seabed. The sound is attenuated and reflected at geological boundaries and the reflected signals are detected using hydrophones along a streamer towed behind the survey vessel.
Geotechnical		
Borehole Sampling	Obtain core samples for geological analysis of formations below the seabed.	Typically, one sample is collected from the centre of the MODU location (with a contingency for one sample at each MODU spud can location [i.e., four in total]), which is used to ground-truth the geophysical data and provides soil strength data that can be used for geotechnical analysis. The maximum depth of the boreholes ranges between 40 m and 80 m below the seabed. Downhole sampling would be undertaken at predetermined intervals. Sampling will typically consist of rotary cores/push cores for the full length of one of the boreholes. If the standalone Piezocone Penetrometer Test (PCPT) is unable to penetrate the seabed to the desired depth, PCPT's measurements may also be obtained in a separate borehole.
Seabed grab sampling	Seabed grab sampling provides samples for undertaking geological analysis of unconsolidated seabed sediments.	Grab sampling is used to collect small samples of surface sediments from the seafloor. Only surface sediments are collected as the sampler has no ability to penetrate to depth. The grab sampler is deployed from the survey vessel. A grab sample is proposed to be taken at each core location.

EQUIPMENT	PURPOSE	ACTIVITY DETAILS
		Each grab sample typically covers a spatial area of <1 m^2. 1 grab samples at 5 core sites = 5 grab samples with a maximum total footprint of 5 m^2.
Piezocone Penetrometer Test (PCPT)	PCPT determines soil strength and helps to delineate soil stratigraphy.	PCPT involves the in-situ measurement of the resistance of ground to continuous penetration. This process involves lowering a frame to the seabed and pushing the PCPT unit into the sediment at a steady penetration rate (usually 2 cm per second). A frame is lowered to the seabed with the PCPT unit integrated into it and operated remotely. When the required penetration depth is reached, all equipment is withdrawn from the seabed. A small hole will remain in the seabed, which will eventually collapse and infill with the movement of seabed sediments. A PCPT typically takes 2-2.5 hours to complete. The PCPT frame is approximately 4 x 1 m with a footprint of approximately 4 m^2. The piezocone is either 5 or 10 cm in diameter and penetrates the seabed from 10 m to 60 m.

3.5. Mobile Offshore Drilling Unit

Drilling and P&A activities are proposed to be undertaken using a single MODU, most likely the Valaris 107. If this is unavailable, a similar jack-up MODU will be used. Specifications for the proposed MODU are provided in Table 3-4, noting that other jack-up MODUs will have very similar specifications.

The proposed MODU does not have propulsion capability and therefore will require support vessels to transport it to the Operational Area. Positioning of the MODU is described in Section 3.5.1. Once on location, the legs of the MODU will be lowered to the seabed and the hull raised, lifting the platform above the sea surface to provide a stable, elevated work environment for drilling activities. The MODU can accommodate approximately 112 persons on board (POB) at any given time. Jack-up MODU specifications are listed in Table 3-4.

Table 3-4: Jack-up MODU specifications

COMPONENT	SPECIFICATION
MODU name	Valaris 107
Operator	Valaris
Design	Keppel Fels Mod V Enhanced B Class, non-propelled, self-elevating (jack-up)
Class	ABS A1 Self Elevating Drilling Unit
Registry	Monrovia, Republic of Liberia
Accommodation	112 persons
Hull (Length/Width/Depth)	71 / 64 / 7.5 m
Length including helideck	95.7 m
Length between perpendiculars	71.3 m
Maximum operating water depth	122 m
Maximum drilling depth	9,144 m
Diesel fuel capacity	538 m^3
Lubrication oil	3.5 m^3
Drill water	3,194 m^3
Brine	325 m^3
Liquid mud	619 m^3
Potable water	326 m^3
Base oil	162 m^3

COMPONENT	SPECIFICATION
Bulk cement	151 m^3
Bulk barite/bentonite	171 m^3
Bilge	537 m^3
Waste oil	19.5 m^3

3.5.1. MODU Positioning

The proposed MODU does not have propulsion capability and therefore will be towed into position by up to 2 support vessels (towing vessels), described further in Section 3.7.2. The towing vessels engaged in MODU tow operations do not utilise DP for routine tow operations. The MODU has 3 legs which will be retracted whilst it is being moved onto location, each with a 'spud can' type footing on which the MODU jacks up. Each spud can will have a disturbance footprint of approximately 183 m^2 (based on the Valaris 107 jack-up specifications) with a conservative total footprint of approximately 550 m^2. The MODU will not require any anchors.

A USBL transponder may be lowered to the seabed during this operation. The USBL and all associated equipment will be recovered at the end of activities. The USBL frame will typically cover an area of <2 m^2.

A 500 m PSZ will be established around the finalised well location as per the OPGGS Act prior to drilling commencing. Upon completion of drilling and P&A activities, the MODU will be jacked down and floated by lifting the spud cans off the seabed. The legs will then be fully retracted into the 'up' position and the MODU towed away by towing vessels.

3.6. Drilling Activities

The Judith-2 well design is dependent on the finalised location of the well and subsequent detailed well engineering and therefore is subject to change. Finalised well schematics will be provided in the Well Operations Management Plan (WOMP) submitted to NOPSEMA for assessment prior to the commencement of drilling.

3.6.1. Well Construction

Upon completion of MODU positioning at the well location, drilling equipment will be lowered to the seabed and drilling activities will commence with the top-hole well sections which include the conductor and the surface hole. As per standard practice, drilling of the top-hole well sections will be completed without a riser system and prior to surface blow-out preventer (BOP) installation. At this point, cuttings (consisting of rock chips) and drilling fluids from the top-hole sections will be discharged to sea. All discharges are detailed in Section 3.6.3.

After each section is drilled, cement is used to seal the well casing. Cementing is described further in Section 3.6.4. A schematic of well profile and construction activities is displayed in Figure 3-2.

The sequence of operational activities is as follows:

- Move MODU into Judith-2 location, ROV seabed clearance check
- Position MODU, jack-up and cantilever out over location

- Drill 36" surface hole and run and cement 30" x 20" Conductor
- Drill 17-1/2" surface hole, run and cement 13-3/8" casing
- Install surface blow-out preventor (BOP) and pressure test
- Drill 12-1/4" hole section, run and cement 9-5/8" casing
- Drill 8-1/2'' section to TD
- Run open hole wireline logging, including VSP
- Run and cement 7" liner
- Circulate and clean wellbore
- Perforate production interval
- Conduct DST
- Plug & Abandon well
- ROV seabed clearance check
- Prepare MODU, jack-down
- Move MODU out of Operational Area

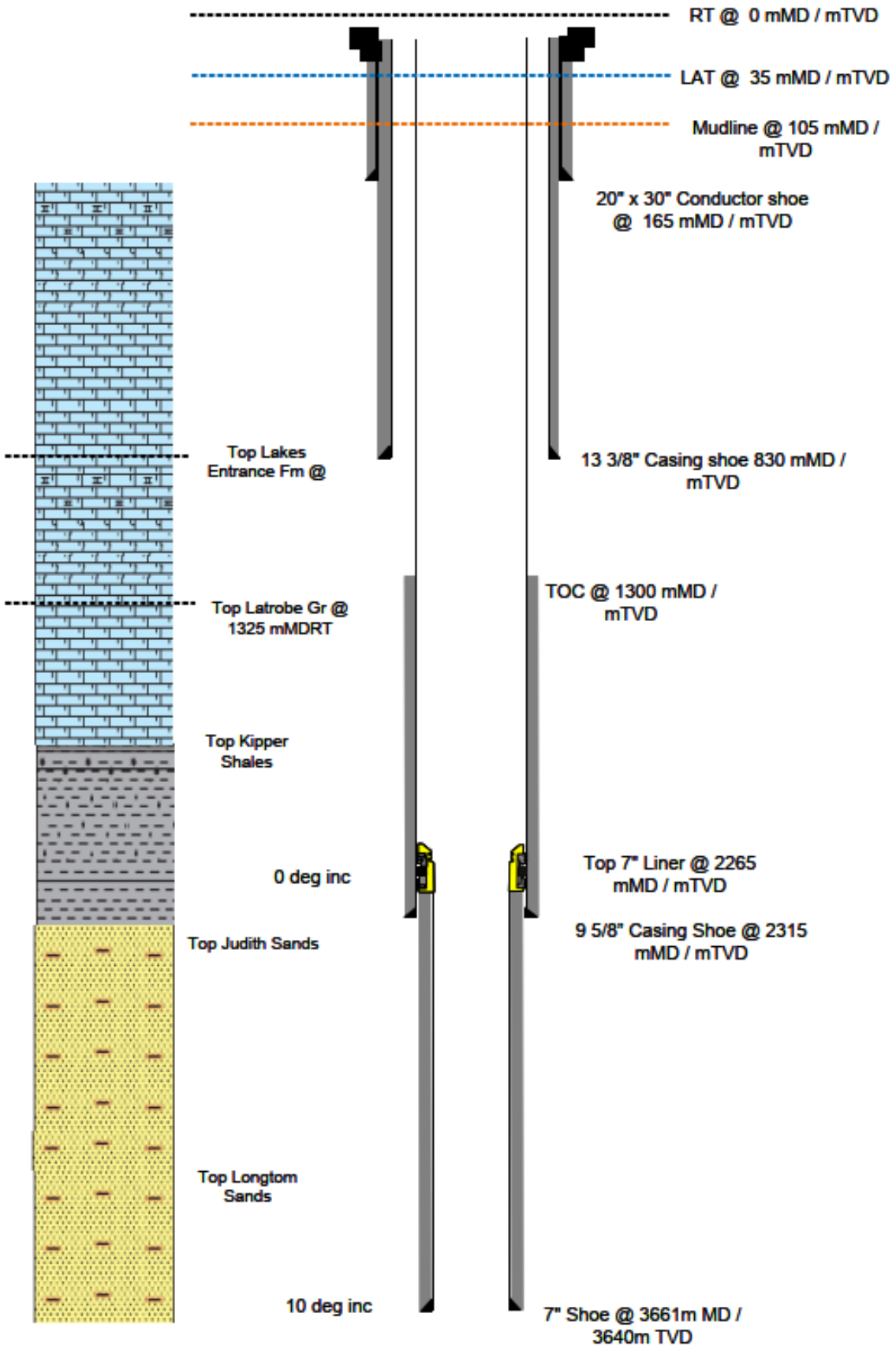


Figure 3-2: Indicative well schematic of well profile and construction activities

3.6.2. Blow-out Preventer Installation and Function Testing

A surface BOP will be installed onto the wellhead after completion of the top-hole sections to control well pressure, should the requirement arise, during drilling activities. A BOP consists of a series of valves and sealing mechanisms, such as annular preventers and ram preventers, which are hydraulically operated. During drilling, the BOP is typically open, allowing the drill fluid to circulate up to the MODU. If an influx of hydrocarbons from the formation into the wellbore occurs, the BOP will close and the MODU's high-pressure circulating system will be used to remove the influx from the well and regain hydrostatic overbalance. The annular and ram preventers are used to shut in around various tubulars in the well, while the blind shear rams are designed to shear the pipe and seal the well.

Regular function and pressure tests will be undertaken once the BOP is installed. Function testing is undertaken by activating the MODU's hydraulic control system to confirm functionality of the BOP systems. Pressure testing is undertaken to verify the BOP's seals. In accordance with industry standards and the Drilling Contractor's maintenance system, function tests will generally be undertaken every 7 days and pressure tests every 21 days. As the BOP is mounted on the MODU there will be no discharges to the marine environment.

Greater detail on the performance standards for the BOP system, including design, functionality and preventative maintenance, is provided in the NOPSEMA accepted Safety Case.

3.6.3. Management of Drilling Fluids, Cuttings and Discharges

Drilling fluid performs several functions including cooling and lubricating the drill bit, transporting drill cuttings to the surface, and maintaining hydrostatic pressure. Hydrostatic pressure is the pressure exerted by the weight of the drilling fluid within the wellbore. While drilling, hydrostatic pressure is maintained higher than the formation pressure to prevent an influx of hydrocarbons from the formation into the wellbore. This serves as the primary well control barrier. Drilling fluids used during the Project will be water-based mud (WBM). No planned or contingency use of SBM is proposed for the activity.

Consistent with industry practice, all drilling fluids and cuttings generated during drilling without a riser will be discharged to sea, with cuttings returned directly to the seabed where they will be deposited in the vicinity of the wellhead.

Once the surface casing and BOP is installed, drilling fluids and cuttings will be returned to the MODU, where they will be separated using solids control equipment. The solids control equipment comprises of shale shakers which remove coarse cuttings from drilling fluids so that the recovered drilling fluids can be centrifuged. Centrifuging the drilling fluids will remove finer solids not separated out by the shale shakers. The cuttings and finer solids will be discharged below the water line and the recovered fluids will be recirculated into the system.

Drilling fluid, bulk dry products, brine and drill water are transferred to the MODU from supply vessels and stored in tanks and pits. Cement, barite and bentonite are transported as dry bulk to the MODU by support vessels and pneumatically blown to the MODU storage tanks using compressed air, with excess compressed air vented to atmosphere. This venting process carries small amounts of solids which are discharged below the MODU. Dry and liquid additives are mixed into the fluid system from sacks or containers. The drilling methodology for the Judith-2 well, including section specifications and fluid and cuttings details, is outlined in Table 3-5.

Table 3-5: Well profile for Judith-2

HOLE SIZE	CASING / LINER SIZE	APPROX SECTION DEPTH (M)	HOLE LENGTH (M)	FLUID TYPE	APPROX. CUTTINGS VOLUME (M^3)	FLUID DISCHARGE LOCATION	FLUID (WBM) DISCHARGE VOLUME M^3)	CUTTINGS DISCHARGE LOCATION
36"	30" casing	175	70	Seawater + high viscosity sweeps	69	Seabed	183	Seabed
17 ½ "	13 3/8" casing	850	675	Seawater + high viscosity sweeps	125	Seabed	570	Below sea-level surface
12 ¼"	9 5/8" casing	2,325	1,475	WBM	125	Surface / re-circulated	700	Below sea-level surface
8 ½"	7" liner	3,661	1,336	WBM	54	Surface / re-circulated	516	Below sea-level surface

3.6.4. Cementing Operations

Cement is used to seal the casing following drilling of each section. Bulk dry cement is transported to the MODU via supply vessels and transferred to dry bulk storage tanks. During the transfer process, the holding tanks are vented to atmosphere, resulting in small amounts of dry cement being discharged from venting pipes located under the MODU.

Cement fluids are discharged to the marine environment as part of testing the cementing unit (up to 4 m^3 per test, up to 6 times for a well), on completion of each cementing job (3 m^3 discharged up to 8 times for a well) and in the event the cement spoils or if there is an issue with the cementing operations (up to 24 m^3).

After a string of casing or liner has been installed into the well, a cementing spacer is pumped to flush drilling fluids and filter cake from the well to allow a good cement bond to be formed with the formation. Cement slurry is pumped down the inside of the landing string, followed by casing (or liner). A displacement fluid is then pumped into the casing with a wiper plug to displace the cement out of the bottom of the casing and up into the annular space between the pipe and the borehole wall. For all other casing and liner cementations, the cement will predominantly remain downhole. In the case of a liner cement job, some excess cement will be circulated back to surface and discharged into the sea. When the wiper plug is pumped and reaches the bottom of the casing string, it stops and allows the casing to be pressure tested.

Abandonment cement plugs are planned to safely P&A the well. The final abandonment program will ensure moveable hydrocarbons (identified while drilling) are isolated per the NOPSEMA-accepted WOMP.

If mixed batches of cement spoil within the cementing unit, or there is a problem during the cementing operation, cement slurry will be either flushed from the cement unit or circulated out of the well and discharged to sea. A discharged batch of cement slurry may be up to 22 m^3 (140 bbl). To ensure only the required amount of cement is produced, detailed cementing procedures shall be developed. The cementing procedures will include provision to mix only enough cement to complete the cementing operation, with allowance for loss to formation as well as the monitoring and reconciliation of used quantities of cement against planned quantities for each cementing operation.

Upon completion of each cementing activity, the cementing head and blending tanks are cleaned which results in a release of cement-contaminated water to the sea. Prescriptive cementing procedures will be used to manage the discharge of cement volumes. Upon completion of activities, any remaining bulk cement will be managed by one of the following options, in order of preference: left onboard the MODU to be handed to the next operator, pumped downhole, transferred to shore. If none of these are possible due to technical or safety restrictions, then unused bulk will be discharged to sea as a one-off discharge of mixed slurry with a maximum dry bulk volume of 100 m^3.

3.6.5. Formation Evaluation

During drilling, the formation will be evaluated to determine the presence and quantity of hydrocarbons within the target reservoir. This information is gathered using the following techniques:

- Mud logging – mud samples are collected and analysed.
- Logging while drilling (LWD) – LWD tool string collects data from the well in real time, using a LWD downhole tool.
- Wireline logging - using electric instruments to continuously measure the properties of a formation and to obtain material or fluid samples.
- Vertical seismic profiling (VSP) – using seismic signals from within the well to assess surrounding rock and fluid properties.

VSP is a routine activity conducted during drilling activities to characterise the subsurface reservoir volumes and provides detailed information regarding geological structures and stratigraphy in the vicinity of a well. VSP involves deploying an acoustic sound source from the MODU or a support vessel, while a number of receivers are positioned at different depths within the drilled well.

For the activity, the duration of VSP will be up to 6 hours and will utilise an acoustic source (up to 4 x 150 in^3).

3.6.6. Contingency Drilling Activities

Contingency drilling activities such as re-spudding the well or side-tracking may be required if surface casing strings do not reach their planned setting depth. This could be a result of borehole instability, where the borehole does not maintain its size and shape which can result in structural integrity issues. Contingency drilling activities may also include the use of lost circulation materials in the event of downhole fluid losses to the formation. Lost circulation can occur when the drill bit encounters natural fissures in the rock formations, causing drilling fluids to flow into these spaces rather than circulating back to the MODU. In both cases, these contingency drilling activities are undertaken to maintain well control.

Potential contingency drilling activities may generate additional volumes of drilling fluids and cuttings to be discharged. Discharges for any contingency drilling activities will be similar as those described for planned drilling operations and will therefore have similar environmental impacts as those described in Chapter 5.

Table 3-6: Contingent Drilling Activities

ABNORMAL CONDITION	CONTINGENCY DRILLING ACTIVITY	PROCESS	ADDITIONAL DISCHARGE
Operational or technical issues when drilling/ running the 36" hole/ 30" conductor	Re-spud	Move the MODU and drill a new well in a suitable, safe location within the immediate vicinity of the original well. Well construction issues resulting in a re-spud generally occur during riser-less operations, when response or remediation options are more limited.	Maximum additional discharge is equal to double the estimate of fluids and cuttings discharged during the 30" section detailed in Table 3-5, with an additional 100 m cement plug.
Operational or technical issues when drilling or running casing in the 17 1/2", 12 1/4" & 8-1/2" open hole sections. Requirement to assess an alternative geological target with the same wellbore (due to poor geological results), Stuck pipe downhole event that proves to be not retrievable after multiple attempts	Side-track	Standard approach is to P&A the original wellbore with a cement plug in accordance with regulatory requirements, followed by setting a high-density cement plug or a mechanical whipstock inside the previous casing. A window would be milled through the original casing (along with cement behind) to create an opening for the new side track wellbore. The drilling assembly would be guided through the window to continue drilling to target depth.	Activities following the side track would be the same as those planned for the original wellbore. The window milling operations would generate some metal swarf which will be handled on the rig and disposed of onshore.
Lost circulation. When drilling fluid preferentially flows into exposed geological formations instead of returning up the annulus.	Use of lost circulation materials (LCM)	Use of insoluble or fibrous fluid additives, bridging agents such as ground calcium carbonate, or, in extreme cases, cement.	Potential for additional cement discharges. Quantities will be dependent on the scenario encountered. For example, when using cement to respond to severe lost circulation it may be possible to continue drilling by drilling out the cement in the wellbore, however in other scenarios it may be necessary to side-track.

3.6.7. Well Test

Well testing will be undertaken in the form of a drill stem test (DST) to confirm the existence of transportable hydrocarbons, evaluate reservoir characteristics and flow rates, assess non-hydrocarbon components, determine liquid yields and collect representative fluid samples.

The DST will be of short duration, expected to occur for approximately 48 hours per DST, up to a maximum of 144 hours in total, with a maximum flow rate of 60 MMscf/d and involve initial well clean-up followed by controlled flow period. The following process will be used:

- Base oil (~200 bbls, or 32 m^3) will be circulated into the DST string to provide the required underbalance conditions across the reservoir to enable the well to flow. This will be transferred from the support vessel to the MODU via hoses. The base oil will meet the low toxicity requirements when assessed against AGR's Chemical Assessment Procedure, described in Section 8.4.4.
- When the well is opened, the base oil will be flowed up the DST string into the well test package. Initially the flow will go to the stock tank and then be diverted to the separator once gas is observed at surface.
- The base oil in the tank will be pumped to the flare to be burned (this will minimise the risk of oil drop out).

To maintain liner hanger integrity during the DST, the following process will be used:

- Base oil (~150 bbl, or 24 m^3) will be displaced into the drill string to provide the required underbalance to inflow test the liner.
- Upon completion of the inflow test, the base oil will be reverse circulated back into the pit system
- The base oil can then be shipped back to shore for disposal.

During testing, reservoir fluids will be directed to the well test separator on the MODU, where they will be separated into gas, condensate, and water phases. Samples of separated gas and liquid will be taken for later onshore laboratory analysis. Non-flammable liquids will be sent through a water filtration system to ensure oil-in-water (OIW) concentration is less than 30 ppm for overboard discharge. If a fluid remains above 30 ppm OIW, it will be stored in tanks for onshore disposal. Flammable hydrocarbons will be transferred to the flare boom.

The flare will be a 'Green Burning' system and use air compressors to atomise the condensate, yielding smoke-free combustion.

Upon completion of the DST, the well will be suspended by umping a specified volume and concentration of kill-weight brine into the wellbore, retrieving the test string, and installing a cement plug.

3.6.7.1. Well Testing Alternates Considered

The requirement to conduct a well test as part of the formation evaluation program was formed upon Judith-1 (Judith Gas Field discovery well) drilled through a ~450 m gross column of gas but was not at the time fully evaluated by Shell Australia for the potential flow rates of gas.

In order for the field to be assessed by Emperor Energy for a viable commercial development, an established baseline flow rate under existing reservoir conditions is required, to ascertain the reservoir properties and the drive mechanisms for the reservoir(s).

In addition to ascertaining a commercial flow rate the well test will compliment and provide data redundancy to the *conventional* wireline datasets, alongside recovery of sufficient volumes of the formation

fluids (gas, condensate or formation water) for post-well analysis including; gas composition (inclusive of potential H_2S, Hg and CO_2 content), energy factors, water salinity. This data recovered from the well test and post-test laboratory analysis are critical datasets required for the future engineering and operational design of the field development design (inclusive of wells, subsea equipment, pipelines and onshore processing) for the commercial development of the field and into gas production

Alternate options to a DST were considered but not adopted; no testing, conventional wireline pressure test & sampling program or utilisation of new large-volume, deep transient testing wireline logging tools.

Option Analysis

Table 3-7 assesses the four well test options available for this campaign, as listed below:

- Option A: Conventional Wireline Program
- Option B: Conventional Wireline Program + Fluid Sampling/ Mini-DST
- Option C: Conventional Wireline Program + Large Volume Tester
- Option D: Conventional Wireline Program + Drill Stem Test

Table 3-7: Well Testing option assessment

	OPTION A	OPTION B	OPTION C	OPTION D
Meets critical success formation evaluation data requirements				
Fluid Sample (Volume)	No	Yes - 20 L	Yes - 20 L	Yes - >100's L (limited only by time)
PVT Sample (inc. H_2S, Hg, CO_2)	No	Yes	Yes	Yes
Formation Pressure & Gradient	Yes	Yes	Yes	Yes
Formation Permeability	Yes	Yes	Yes	Yes
Formation Pressure Boundaries	No	No	Yes - Limited range (100's m)	Yes - Extended range (km's)
Reservoir Flow Rate	No	No	Yes - D/H pump induced, limited 100 bbl/ day	Yes - Reservoir free flow
Sand Production	No	No	No	Yes
Deployment Risks				
Deployment Technique	O/H - Wireline	O/H - Wireline	O/H – Wireline O/H – LVT drill pipe	O/H – Wireline C/H – DST drill pipe
Risks	Baseline	Increased risk of wellbore integrity issues due to extending open hole time (additional ~1-2 days).	Increased risk of wellbore integrity issues due to extending open hole time (additional ~4-7 days). Flowing reservoir fluids through BOP Choke & Kill lines during pump-out. New technology development	Surface handling reservoir fluids, flaring and associated light, sound, GHG emissions.

Conducting a conventional DST (Option D) is deemed the only method to accurately determine the physical flow rates (to inform asset commerciality assessment) over multiple targets (appraisal and exploration) within the well, with an industry accepted piece of equipment and process.

The Judith-1 well also encountered hole problems and drilling fluid invasion across the gas bearing reservoirs, which influenced the operational design of the Judith-2 well and choice of a cased hole perforated DST.

3.6.8. Well Plug, Abandonment and Removal

Following completion of drilling and well testing activities, the Judith-2 well will be permanently plugged and abandoned (P&A) in alignment with section 572 of the OPGGS Act. P&A procedures are designed to permanently isolate the well and mitigate the risk of a potential release of wellbore fluids to the marine environment.

P&A operations involve setting a series of permanent cement plugs within the well. Plugs will be set above the hydrocarbon bearing intervals identified for isolation, at appropriate barrier depths in the well. These plugs are tested, by weight, to confirm their integrity.

Following P&A operations and confirmation of the permanent barriers, the wellhead is cut with the use of a mechanical cutting tool and removed below the mudline (~1.5 m), leaving no remaining well infrastructure on the seabed. The cutting process produces metal shavings (swarf), some of which remain on the seabed. Conservatively, the retrieval of the wellhead will result in an area of approximately 50 m^2 of benthic disturbance.

P&A operations will be conducted in accordance with a NOPSEMA-accepted WOMP.

Once the well is plugged and abandoned, a ROV will be deployed from the MODU to conduct a post-operation survey. This survey records the condition of the seabed at the completion of the Project to ensure that no dropped objects or subsea equipment intended for removal remain on the seabed. The ROV is described further in Section 3.7.3.

3.7. Support Activities

3.7.1. MODU Operations

Drilling activities will be undertaken using a jack-up MODU (as described in Section 3.5) which can have up to 112 POB. Routine MODU operational discharges at full POB are detailed in Table 3-8.

Table 3-8: Routine MODU and Vessel Discharges

DISCHARGE TYPE	QUANTITY MODU (APPROX.)	QUANTITY EACH SUPPORT VESSEL (APPROX.)	QUANTITY EACH SITE SURVEY VESSEL (APPROX.)
Putrescible waste (2 kg pp/day (NERA, 2017))	224 kg/day	30 kg/day	64 kg/day

DISCHARGE TYPE	QUANTITY MODU (APPROX.)	QUANTITY EACH SUPPORT VESSEL (APPROX.)	QUANTITY EACH SITE SURVEY VESSEL (APPROX.)
Sewage & grey water (0.45 m^3 pp/day NERA, 2017))	50.4 m^3/day	6.75 m^3/day	14.4 m^3/day
Reverse osmosis (RO) brine (Esso Australia Resources, 2024)	1500 bbl (240 m^3)	450 bbl (70 m^3) (estimated)	200 bbl (32 m^3) (estimated)

3.7.2. Vessel Operations

3.7.2.1. Survey Vessels

The geotechnical survey vessel will be similar to the *Fugro Mariner* which may hold station using DP or propellers as water depths in the Survey Area are too deep for anchoring (~74 m). The geophysical survey will be undertaken with a vessel similar to *Quest Maritimes Silver Star*. No more than one vessel will be present in the Survey Area (4 km × 4 km Operational Area) at any one time during survey activities. Survey vessels are expected to have approximately 32 POB. Survey activities are further described in Section 3.4.

The survey vessel transiting to or from the Survey Area (as defined in Section 3.2) is deemed to be operating under the Commonwealth Navigation Act 2012 and not performing a petroleum activity.

3.7.2.2. MODU Support Vessels

MODU support vessels include towing vessels, platform supply vessels (PSV) or multi-purpose support vessels. Support vessels generally have up to 15 POB. Support vessels will be either stationary using DP or operating at slow speeds (<8 knots) while undertaking activities within the Drilling Area, which include:

- MODU mobilisation/positioning:
  - Two vessels towing the MODU to/from the well location. Vessels engaged in towing do not utilise DP in routine tow operations.
- Drilling activities:
  - One vessel on standby for the MODU once on location e.g. monitoring the 500 m radius PSZ around the MODU and interception errant vessels and standby during helicopter take-off and landing.
  - One vessel resupplying food, bulk materials, fuel, equipment and wastes between MODU and shore base.
  - Assisting in emergency response situations.

During drilling activities, one vessel will support the MODU within the Drilling Area (i.e. PSZ). This vessel may be transiting within the PSZ undertaking safety (vessel in transit) or resupply (vessel on DP) operations. A second support vessel may at times be 'on standby' outside the Drilling Area.

3.7.2.3. Vessel Specifications and Discharges

All vessels required for the activity will be operated in accordance with international and Australian regulatory requirements. All vessels will be certified as compliant with international maritime legislative requirements by a Classification Society registered with International Association of Classification Societies (IACS) or by Australian Maritime Safety Authority (AMSA). All vessel refuelling and crew mobilisation will occur at port. The maximum fuel tank size of any vessel undertaking petroleum activities within the Operational Area will be 280 m^3.

Expected routine vessel operational discharges at full POB are detailed in Table 3-8. The amount of putrescible waste, sewage and grey water depends on the number of POB. NERA (2017) estimates the average volume of putrescible waste to be 1-2 kg per person per day while sewage and grey water from ablution, laundry and galley facilities is typically between 0.04-0.45 m^3 per person per day. To conservatively estimate the operational discharges for this activity, the maximum of estimates from NERA (2017) are used as the basis for the calculations in Section 5.2.1.

Bilge water generated on the MODU and support vessels consists of deck drainage and water from machinery spaces directed to a bilge water tank. Contaminants can include chemical spills on deck. This bilge water is diverted to a holding tank for either onshore disposal at a licensed facility or discharge, ensuring an oil content of <15 ppm in accordance with Marine Order 91.

3.7.3. ROV Operations

A ROV is a tethered underwater vehicle deployed and controlled from a vessel or the MODU. ROVs may be deployed and controlled from either the MODU or support vessel to undertake:

- Pre- and post-activity site surveys.
- Equipment deployment, monitoring and retrieval.
- Tool deployment and operation.

Typically, ROVs are linked by either a neutrally buoyant tether or a load carrying umbilical cable along with a tether management system, which is preferred in rough conditions, deeper water or large payloads. The ROV will be moored on the deck of the vessels or MODU and is unlikely to be temporarily parked on the seabed. However, if required to park on the seabed, the temporary disturbance footprint would be approximately 2 m^2.

The ROV is designed with closed-system hydraulics, where hydraulic fluid is circulated to move components such that hydraulic fluid would not be released or discharged.

3.7.4. Helicopter Operations

The MODU is serviced by helicopter, with an average expected flight frequency of up to 5 times per week. Helicopters will primarily be used for crew changes, surveillance and minor supplies but may also be used in the event of an emergency evacuation.

Helicopter operations within the Operational Area are limited to landing and take-off directly to and from the MODU helideck. Offshore refuelling of the helicopters whilst onboard the MODU is not planned.

4. DESCRIPTION OF THE ENVIRONMENT

4.1. Regulatory Context

In accordance with Section 21(2) of the OPGGS(E) Regulations, this section describes the physical setting plus ecological and social receptors of the receiving environment relevant to the petroleum activities described in this EP. The environment that may be affected (EMBA) is described in Section 4.2 and detailed in Figure 4-1 and Table 4-1. In addition, the spatial extent of project specific EMBAs used for assessing impacts and risks associated with the Project are also detailed in Table 4-1.

As per Section 21(3) of the OPGGS(E) Regulations, relevant values and sensitivities may include any of the following:

a) the world heritage values of a declared World Heritage property within the meaning of the EPBC Act;

b) the national heritage values of a National Heritage place within the meaning of that Act;

c) the ecological character of a declared Ramsar wetland within the meaning of that Act;

d) the presence of a listed Threatened species or listed Threatened Ecological Community within the meaning of that Act;

e) the presence of a listed Migratory species within the meaning of that Act;

f) any values and sensitivities that exist in, or in relation to, part or all of:

a. Commonwealth marine area within the meaning of that Act; or

b. Commonwealth land within the meaning of that Act.

The values and sensitivities listed above have been used to determine those receptors requiring a greater level of detail described within this EP. In addition, greater detail has been provided within the description of the existing environment where:

- Species listed as threatened or migratory under the EPBC Act and known or likely to occur in the Operational Area or other defined EMBA (Table 4-1) as determined by the PMST report (Appendix A)
- Species has biologically important behaviour such as breeding, foraging, resting or migration (DCCEEW 2023) occurring in the Operational Area or other defined EMBA (Table 4-1) as determined by the PMST Report (Appendix A).
- Species have a biologically important area (BIA) occurring in the Operational Area or other defined EMBA as determined from the National Conservation Values Atlas (NCVA).
- Key Ecological Features (KEFs) occurring in the Operational Area or other defined EMBA (Table 4-1) as determined by the PMST report.

4.2. Environment That May Be Affected

The EMBA is defined as an area where a change to ambient environmental conditions has the potential to occur as a result of activities described within this EP. The spatial boundary used for the EMBA and for describing the existing environment for this EP has been defined by the low hydrocarbon exposure threshold (as described in NOPSEMA document A1289237-IP2376 (NOPSEMA 2025a)) resulting from multiple loss of well control (LOWC) modelling scenarios (RPS 2022). This low hydrocarbon exposure threshold represents the largest potential exposure to the surrounding waters, shorelines and sensitive receptors based on the combined results of 200 simulations.

In addition, the spatial extent of project specific EMBAs resulting from activities described within this EP (Section 3) such as noise and light emissions used for assessing impacts and risks are also detailed in Table 4-1.

Table 4-1: Judith-2 Exploration Drilling Campaign Operational Area and EMBA descriptions

AREAS		DESCRIPTION
Operational Area		The Operational Area (Figure 4-1) will be located within Commonwealth waters and is where all infrastructure and activities associated with this project will be located as detailed in Section 3.2.
Noise EMBAs	Continuous Noise EMBA	The 5.22 km continuous noise EMBA (Figure 4-2) is based on the maximum distance to the NOAA (2024) marine mammal behavioural response criterion of 120 dB re 1 µPa (SPL, for continuous noise) (Scenario 4 - MODU Drilling + OSV DP) of the acoustic modelling in Liu et al. (2025).
	Impulsive Noise EMBA	The 2.82 km impulsive noise EMBA (Figure 4-2) is based on the maximum distance where the NOAA (2024) marine mammal behavioural response criterion threshold of 160 dB re 1 µPa (SPL) is reached resulting from emissions from a VSP source as described in acoustic modelling in Liu et al. (2025).
Light EMBAs	20 km Light EMBA	The 20 km light EMBA (Figure 4-3) has been defined to include routine MODU and vessel light emissions, based on the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023b). The Guidelines recommend assessing light impacts when listed species' important habitats are within 20 km of the light source. This distance reflects observed effects of sky glow on marine turtle hatchlings (15 – 18 km) and seabird fledgelings grounded by artificial light up to 15 km away. Therefore, a 20 km light EMBA is adopted to account for the potential impacts on marine turtles, seabirds, and migratory shorebirds during the campaign activities.
	63 km Flaring Light EMBA	The 63 km light EMBA (Figure 4-3) for light emissions as a result of flaring is based on the light assessment study conducted for the approved Beach Energy Otway Development OPP (Beach, 2025). This is considered an

AREAS	DESCRIPTION
	appropriate proxy for this campaign with flaring activities having a proposed maximum flow rate of 60 MMscf per day, compared to Beach's modelling using a flow rate of 65 MMscf per day. The 63 km flaring EMBA threshold was calculated based on a horizontal boom at a height of 49 m extending horizontally approximately 14 m from the MODU deck, which is considered comparable to Judith-2's flaring conditions.
MDO EMBA	The Marine Diesel Oil (MDO) EMBA (Figure 4-1) has been defined to include the worst-case extent of predicted hydrocarbon exposure from a vessel fuel tank rupture resulting in the total loss of containment of MDO from a fuel tank (280 m^3 release of MDO over 6 hours) The MDO EMBA has been defined based on the combined outcomes of stochastic modelling for MDO scenario (i.e., cumulative extent of a total of 100 model simulations per season) using low exposure values for each of the modelled oil components (1 g/m^2 floating, 10 ppb dissolved, 10 ppb entrained, 10 g/m^2 shoreline). These values align with the lower concentrations for identifying ecological, social, economic and cultural features of the environment that may be affected by hydrocarbons (including floating, shoreline, dissolved and entrained) as detailed in document number A1289237 on the application of oil spill modelling in EPs (NOPSEMA 2025a), and for assessing the potential consequences on these features. Note, risk evaluation (Section 5.2.2) is based on the exposure thresholds relevant to each receptor as defined in each evaluation subsection.
EMBA	The largest predicted spatial extent that hydrocarbon could extend may occur during a LOWC event, referred to as the EMBA (Figure 4-1). The EMBA has been defined based on the combined outcomes of stochastic modelling for LOWC scenario (i.e., cumulative extent of a total of 200 model simulations) and is based on a conservative low threshold for each of the modelled oil components (1 g/m^2 floating, 10 ppb dissolved, 10 ppb entrained, 10 g/m^2 shoreline) to predict an extent. These values align with the lower concentrations for identifying ecological, social, economic and cultural features of the environment that may be affected by hydrocarbons (including floating, shoreline, dissolved and entrained) as detailed in document number A1289237 on the application of

AREAS	DESCRIPTION
	oil spill modelling in EPs (NOPSEMA 2025a), and for assessing the potential consequences on these features. Note, the risk evaluation (Section 0) is based on the exposure thresholds relevant to each receptor as defined in each evaluation subsection.

The EPBC Protected Matters Search Tool reports for all EMBAs are detailed in Appendix B.

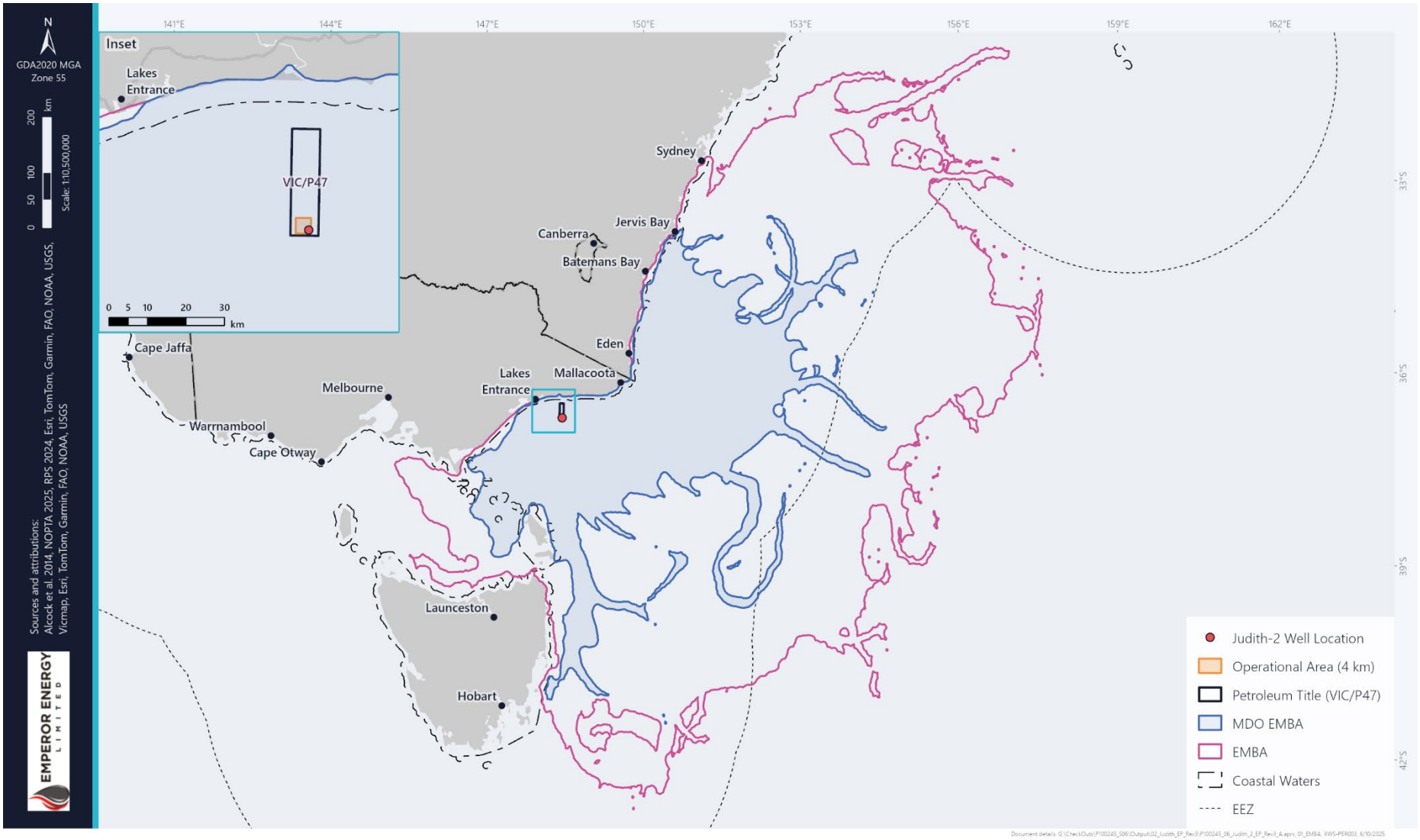


Figure 4-1: Judith-2 Exploration Drilling EMBA

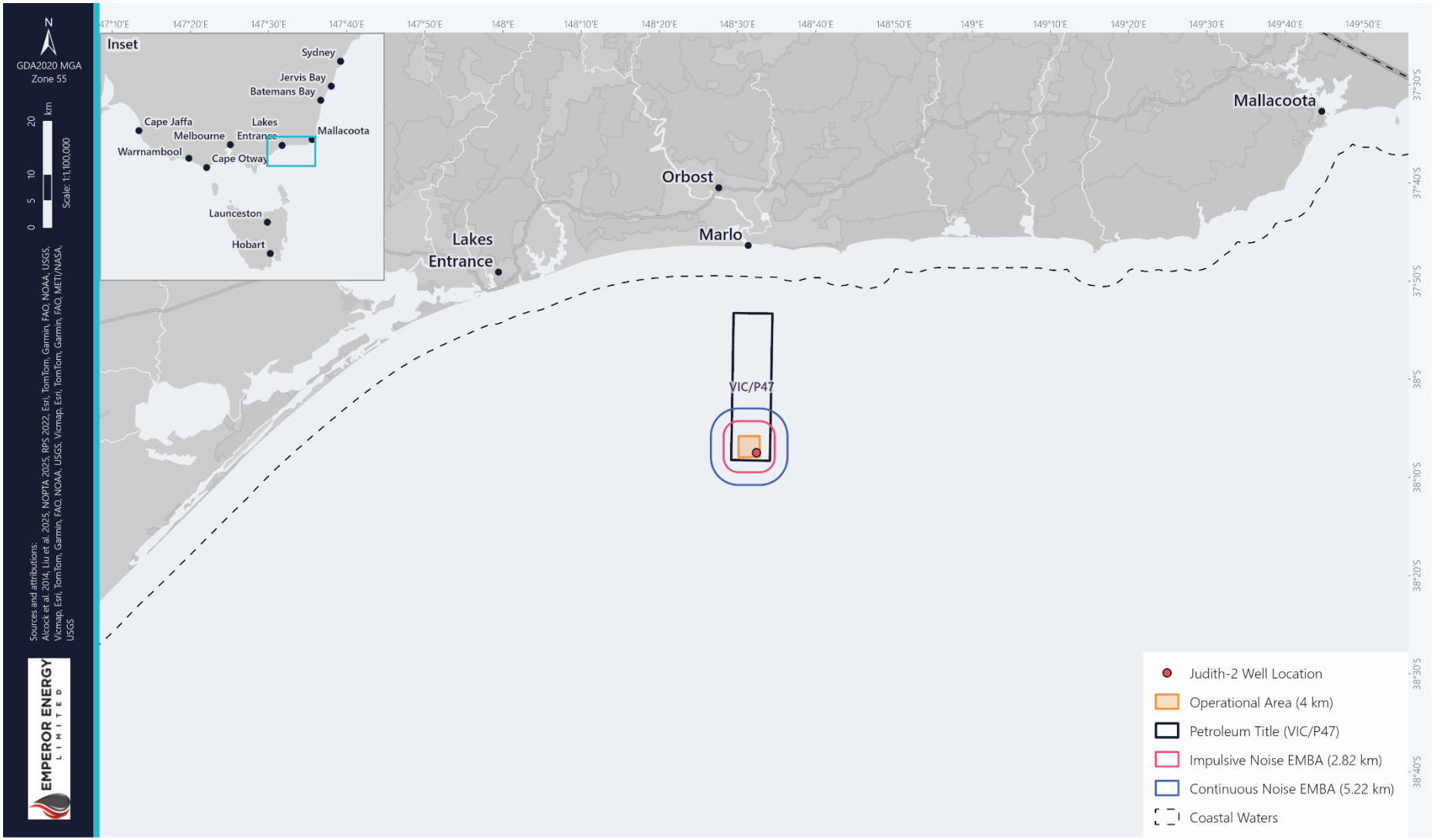


Figure 4-2: Judith-2 Exploration Drilling Noise EMBAs

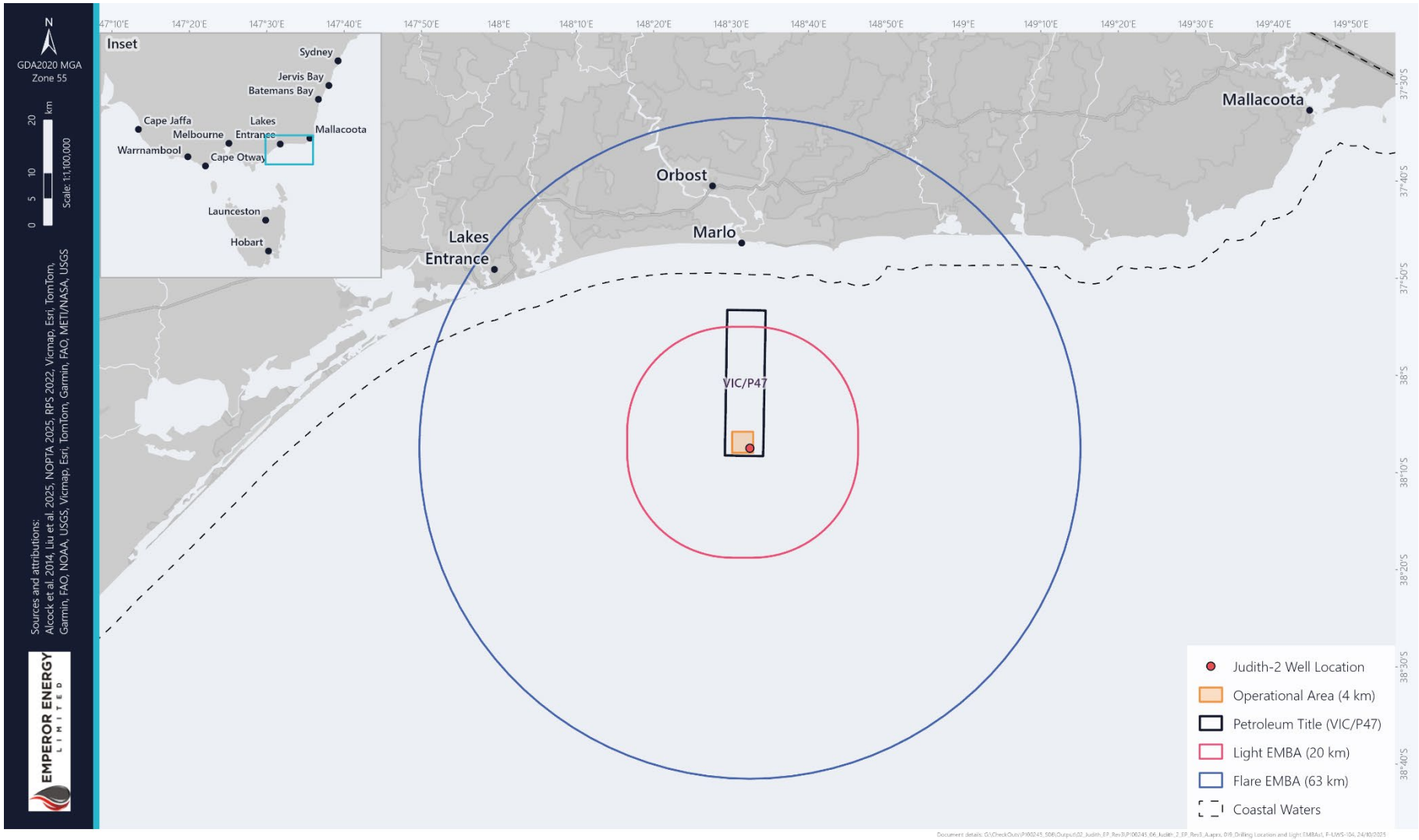


Figure 4-3: Judith-2 Exploration Drilling Light EMBAs

4.3.Regional Context

4.3.1. South-east Marine Region

The Operational Area is located within the Southeast Shelf Transition in the Commonwealth waters, off Victoria's south-eastern coast, within the South-east Marine Region Figure 4-4. The South-east Marine Region extends from the far south coast of NSW, around Tasmania, west of Kangaroo Island in South Australia and covers approximately 1.63 million km^2 of temperate waters (CoA 2015). The region is characterised by its low nutrient and primary productivity levels. Significant seafloor features within the region include the continental shelf, rocky reefs, sea-floor canyons and seamounts. These features often result in significant variation in water depth causing localised areas of relatively high productivity in comparison to the broader region (CoA 2015).

Based on the Integrated Marine and Coastal Regionalisation of Australia (IMCRA) Version 4.0, the Operational Area is within the Twofold Shelf Meso-scale Bioregion. This bioregion encompasses the area east of Wilsons Promontory (including south to the Kent Group Islands in Tasmania) and into New South Wales as far north as Tathra (Barton et al. 2012). The continental shelf within the Twofold Shelf Meso-scale Bioregion has a very steep inshore profile (0–20 m), with a less steep inner (20–60 m) to mid (60–120 m) shelf profile, and a generally flatter outer shelf plain (120–160 m) south-west of Cape Howe (IMCRA 1998).

4.3.2. Temperate East Marine Region

The Temperate East Marine region, overlapped by the EMBA, extends from the southern boundary of the Great Barrier Reef Marine Park to Bermagui in southern NSW and covers approximately 1.47 million km^2 of temperate and subtropical waters (DNP, 2018). Significant seafloor features within the region include the continental shelf, slope, and abyssal plain/deep ocean floor, tropical and cold-water reef systems, seamounts and canyons. The East Australian Current is the main oceanographic process influencing the regions productivity and diversity. The water brought down by this current from the Coral Sea results in a mixing of tropical and temperate waters which allow for a range and multitude of species to be supported (DNP 2018). The region supports biologically important areas (BIAs) for a variety of fish, whale and seabird species. Species of significance include the critically endangered Grey Nurse Shark, vulnerable White Shark and the Humpback Whale who all migrate through the region.

The temperate east network includes eight marine parks which have been implemented to support the natural, cultural, socio-economic and heritage values of the region. Marine parks intersected by the EMBA are discussed in detail in Section 4.7.1.1.

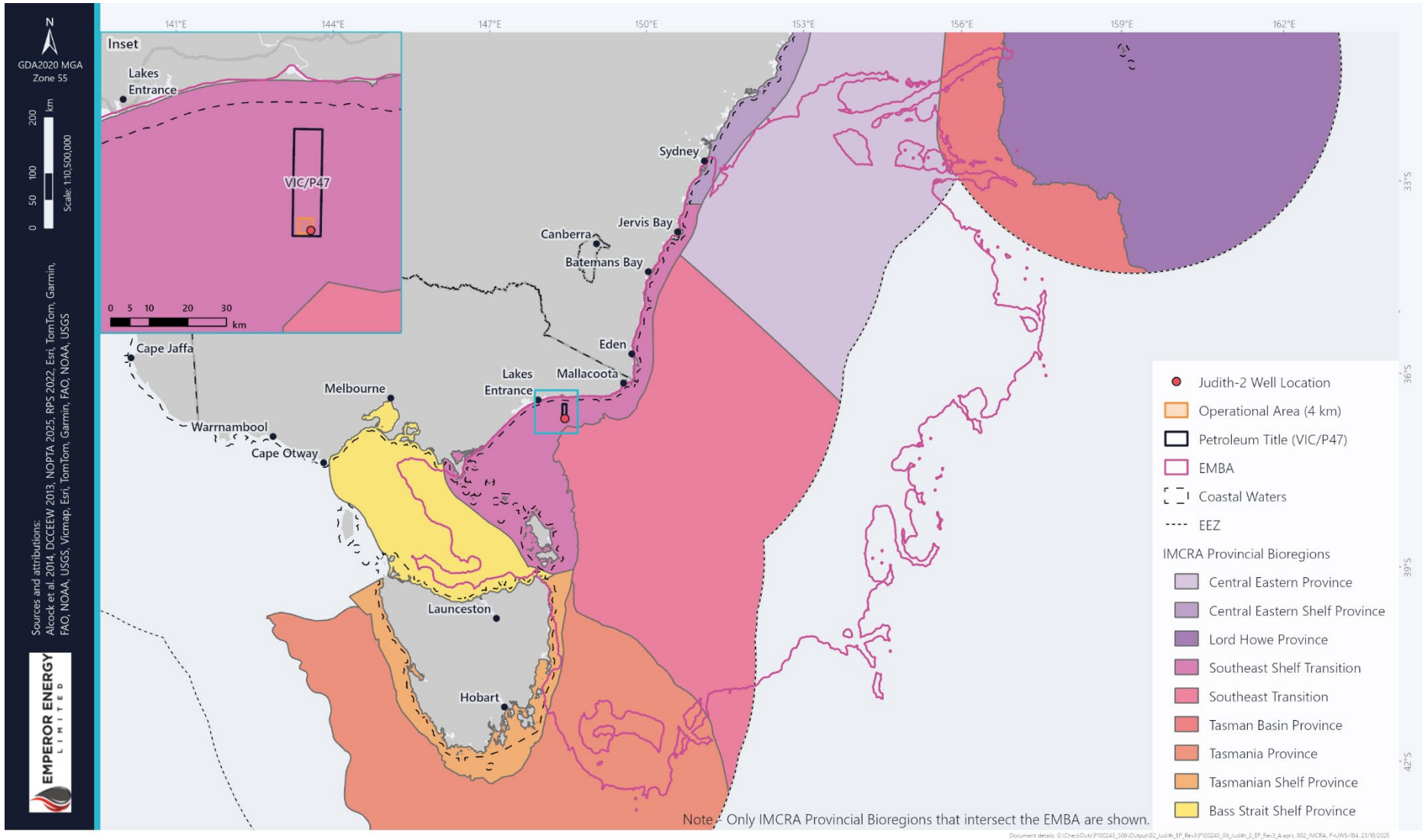


Figure 4-4: IMCRA bioregions within the EMBA

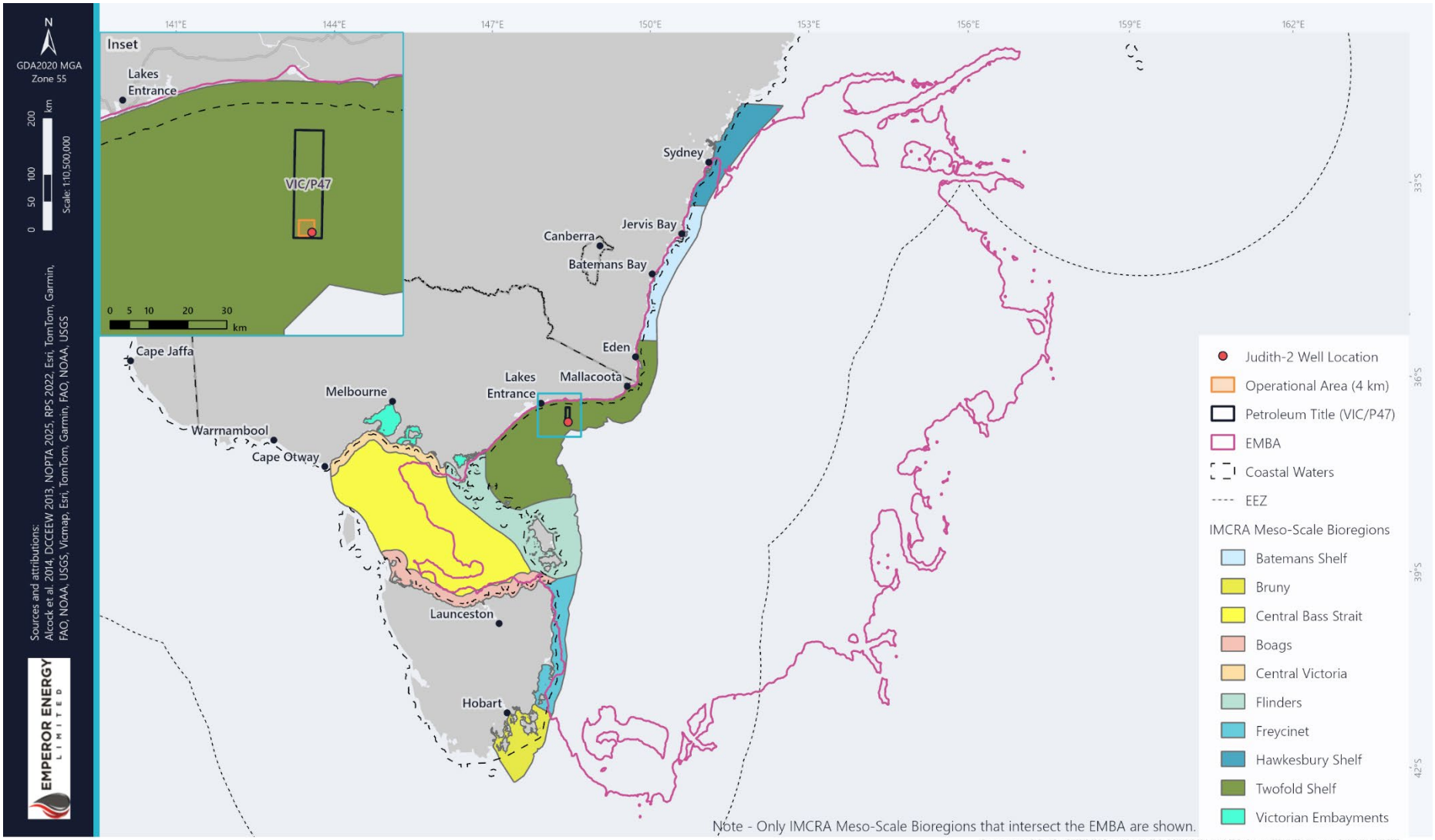


Figure 4-5: IMCRA Meso-scale Bioregions within the EMBA.

4.4. Physical Environment

4.4.1. Climate

The Twofold Shelf bioregion is typical of a cool temperate climate with warm summers and tendency for winter-spring rainfall (NOO, 2002a). Lakes Entrance is the closest meteorological station positioned approximately 40 km northwest of the Operational Area. Data collected at this station between 2006 and 2022 indicates the mean maximum temperature fluctuates from 15.1°C in June to 24.4°C in January, with the mean minimum temperature being 6°C in July and 14.8°C in February (BoM, 2023). Annual rainfall is also recorded at this station with an average of 713.7 mm. During this period the lowest mean rainfall occurred in February (41.5 mm), and the highest mean rainfall occurred in November (71 mm) (BoM, 2023).

Local wind speed typically ranges between approximately 10 and 30 km per hours, with peak gusts reaching 100 km per hour. During winter, the wind direction is predominately westerly. In spring and autumn, when wind speeds are at their strongest, both westerly and easterly winds are common. In summer, the prevailing wind direction is easterly (BoM, 2017). Low-pressure systems known as 'east coast lows' occur once or twice a year and can significantly increase the potential of extreme wave conditions (BoM, 2017).

4.4.2. Oceanography

Weather systems passing over the Bass Strait generate wind and pressure driven currents in the Gippsland Basin. These currents are also influenced indirectly by weather systems passing over the Great Australian Bight (GEMS, 2005). Local currents are tide and wind driven with a predominantly northeast–southwest tidal movement. Rising tide sees tidal flows from the east and west, with a falling (ebb) tide flowing out to the east and west. Tidal streams have a period of 12.4 hours with a phase variance of three to four hours from east to west.

Water temperatures reflect the influence of warmer waters brought into Bass Strait by the East Australian Current, with the southern section of the Twofold Shelf being considerably warmer in summer than other more southerly Tasmanian regions (NOO, 2002a). Along the New South Wales section coastal oceanographic circulation is influenced mainly by northwards settling coastally trapped waves generated in Tasman Sea waters, although inshore a northerly flowing tongue of Bass Strait water is generally present (NOO, 2002a).

4.4.3. Water Quality

Marine water quality within the Gippsland region is expected to be representative of the typically pristine and high-water quality found in offshore Victorian waters (EPA Victoria, 2025). Variations to this state (e.g. increased turbidity) may occur in more coastal regions that are subject to large tidal ranges, terrestrial run-off or anthropocentric factors (i.e. ports, industrial discharges, etc.).

The Gippsland Basin is well mixed as it is a higher-energy environment that is exposed to frequent storms and significant wave activity, although wave energy in the Twofold Shelf bioregion is considered relatively low compared to the Otway and central Bass Strait regions (Barton et. al, 2012).

4.4.4. Sediment Quality

Marine sediment quality within the Gippsland region is expected to be representative of the typically pristine offshore Victorian waters. Variations to this state (e.g. increased metal concentrations) may occur in more coastal regions that are subject to large tidal ranges, terrestrial run-off or anthropocentric factors (i.e. ports, industrial discharges, etc.).

Sediment on the Twofold Shelf is considered poorly sorted, with a median of 92% sand and 8% gravel composition with additional organic and calcium carbonate material present (IMCRA, 1998). The seabed is comprised of fine to coarse sand and areas of shell (CEE Consultants, 2003). It is expected that sediment quality within the vicinity of the Operational Area and wider EMBA will be typical of the offshore marine environment in the Gippsland Basin, which is characterised by high sediment quality with low background concentrations of trace metals and organic chemicals.

The benthic habitat and sediment distribution of the Bass Strait and Gippsland region is shaped by depth and longitude, with fine-grained muds and silty sands dominating deeper waters, sands and gravels occurring across the mid-shelf, and shelly sands present along the inner shelf. These varied sediment types, together with high carbonate content, support diverse benthic assemblages and distinct biological communities across the region (Geoscience Australia, 2006).

Bass Strait forms a 250 km wide, shallow seaway with average water depths of less than 60 m between mainland Australia and Tasmania. The eastern portion of the Bass Strait features Palaeozoic basement rocks which form shallow sills. Surveys showed that the Bass Strait region supports a particularly diverse fauna, with longitude and depth being the most important gradients that influenced the distribution of benthic biota. The sediments in the Bass Strait were generally characterised by fine-grained sediments such as muds and silty sands in the deeper waters, with gravels and sands covering the middle areas of the shelf, and fine shelly sands occurring along the inner shelf from south-eastern Victorian coast. Figure 4-6 shows that the mean grain size in the Operational Area is expected to range between 0.250 mm – 1 mm (Geoscience Australia, 2006).

Carbonate content of sediments in the Bass Strait region is generally greater than 50%, and ranges to over 90% in the central Bass Strait, with the exception of restricted occurrences of limestone and beach rock. A moderate to high proportion (40 – 80%) of carbonate mud is expected to be within the Operational Area (Figure 4-7) (Geoscience Australia, 2006).

A sampling location within the vicinity of the Operational Area (Sample ID DR1798 - ~1.6 km from the Operational Area) detailed within the Marine Sediments (MARS) Database (Nichols, 2009) shows the seabed to consist of >98% sand (62.5 µm – 2000 µm).

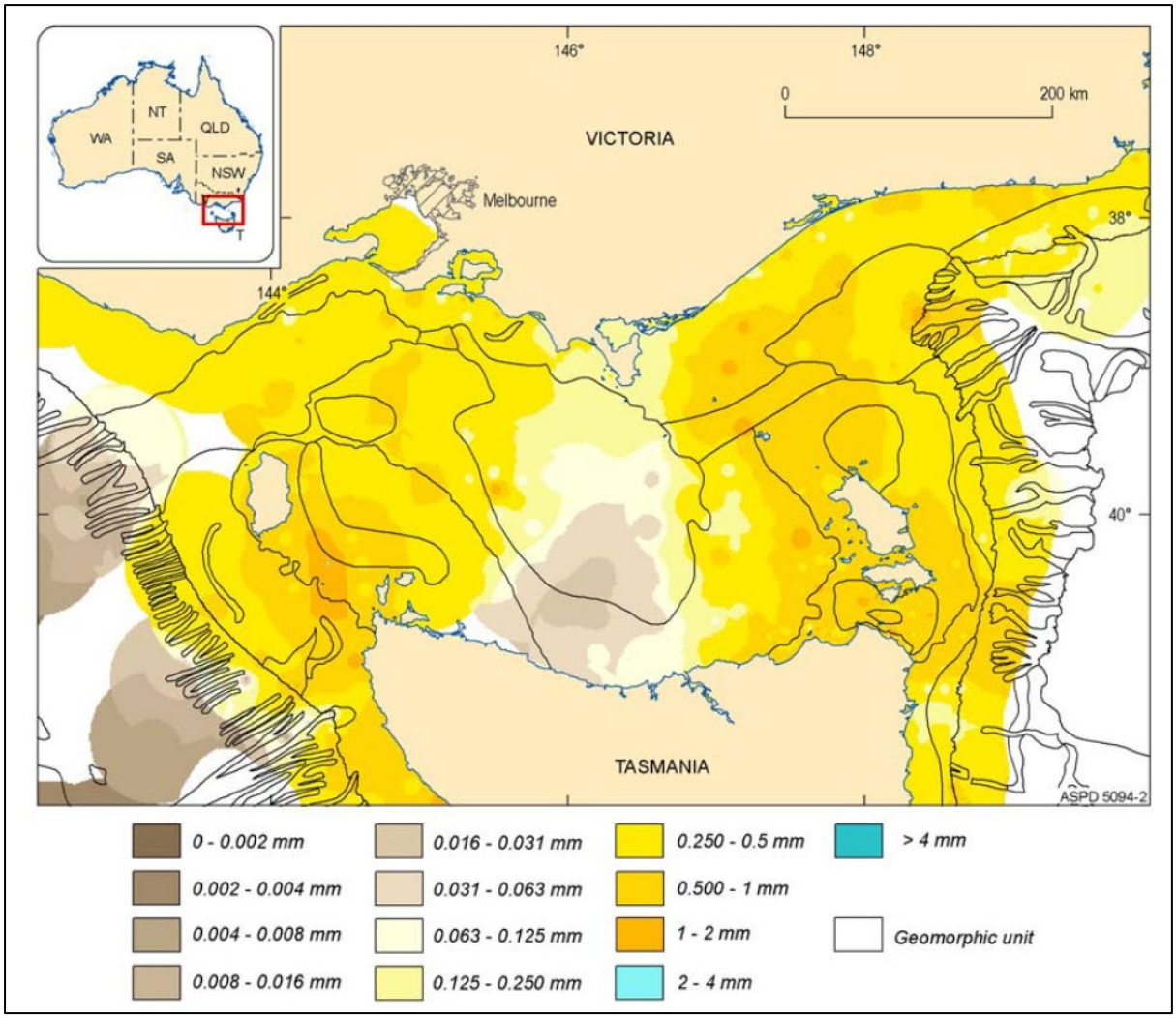


Figure 4-6: Mean grain size in offshore Victoria (Geoscience Australia, 2006)

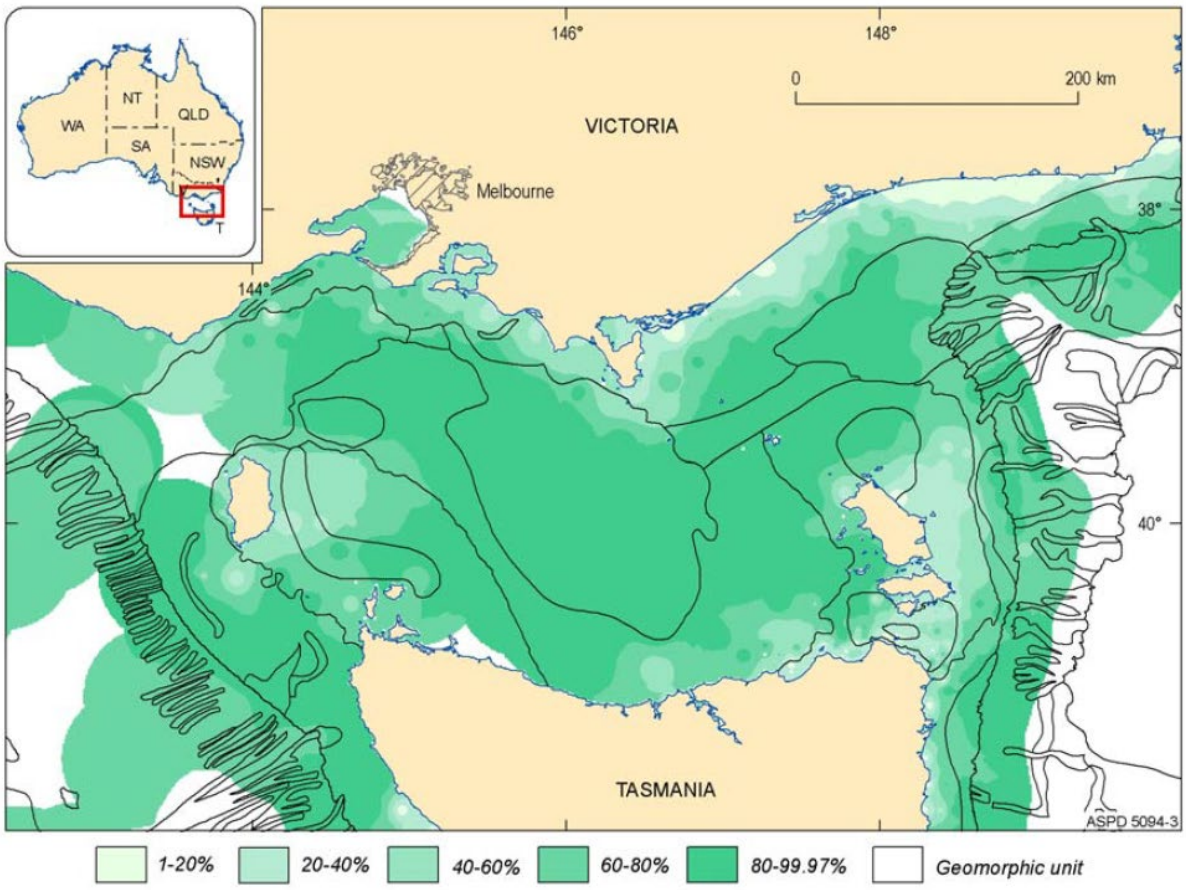


Figure 4-7: Map of carbonate concentrations in surface sediments in offshore Victoria (Geoscience, Australia, 2006).

4.4.5. Air Quality

The Operational Area is situated approximately 37 km offshore from Victoria, where the air quality is expected to be high. However, anthropogenic sources (e.g. vessels, industry developments) would contribute to local variation in air quality.

Historical air quality data from the Cape Grim Air Pollution Monitoring Station on Tasmania's north-west coast, illustrates that most GHGs have shown continuous increases in concentration since the mid-to-late 1970s (CSIRO 2022). However, GHGs that also act as ozone depleting substance, such as CFCs, are now in decline. Increases are principally caused by human activities such as fossil fuel consumption and various agricultural practices.

It is expected that air quality within the vicinity of the Judith-2 well and EMBA will be typical of the offshore marine environment including the Gippsland region.

4.4.6. Ambient Light

Ambient natural light within the offshore Gippsland region is expected to predominantly be from solar / lunar luminance.

Ambient artificial light sources associated with offshore activities exist in the Gippsland region, including both permanent (e.g. offshore developments) and temporary (e.g. vessels) light sources. The Operational Area is located approximately 8.5 km from the nearest offshore facility and approximately 36 km from the

nearest coastal town at Marlo, Victoria. Table 4-2 details population centres within the vicinity of the Judith-2 well location.

Table 4-2: Population centres located within the vicinity of Judith-2

POPULATION CENTRES	DISTANCE FROM WELL LOCATION	LIGHT EMBA (20 KM)	FLARING EMBA (63 KM)
Orbost	~51 km	-	✓
Lakes Entrance	~58 km	-	✓
Marlo	~39 km	-	✓
Nowa Nowa	~62 km	-	✓

4.4.7. Ambient Underwater Noise

Ambient noise within the offshore Gippsland region is expected to be dominated by natural physical (e.g. wind, waves, rain) and biological (e.g. echolocation and communication noises generated by cetaceans and fish) sources. The Gippsland Marine Environmental Monitoring Project reported that ambient sound levels across the Gippsland Basin at 100-500 Hz, ranged from 89.2 to 109.9 dB re 1 $\mu Pa^2/Hz$ (Przeslawski et al., 2016). This variation was driven by site-specific factors, including differential water depth and varying proximity to commercial shipping lanes (Przeslawski et al., 2016).

Anthropogenic noise sources that are also experienced in the area include low-frequency noise from vessels with the Southeast Marine Region, considered one of the busiest shipping regions in Australia. Therefore, the area is likely to be exposed to the occasional sounds generated by mid to large vessels such as tankers and bulk carriers. These commercial vessels typically underwater noise within the 10 Hz to 1 kHz frequency range, with some emissions reaching into the tens of kilohertz (Southall et al., 2017).

4.4.8. Bathymetry

The Operational Area is located in water depths ranging from approximately 60 – 78 m in the Gippsland Basin (Figure 4-8). The bathymetry of the Gippsland Basin is characterised by a narrow continental shelf with a complex mix of rocky reefs and soft sediments. Bathymetric contours in the Gippsland Basin generally align parallel to the coastline, although this pattern becomes less distinct in areas exceeding 50 m in depth. Shelf breaks and submarine canyons enhance oceanographic processes and habitat complexity, while nearby seamounts influence deep-water currents and support unique benthic communities (CoA, 2015). The bathymetry within the EMBA and the greater Bass Strait is further displayed in Figure 4-8.

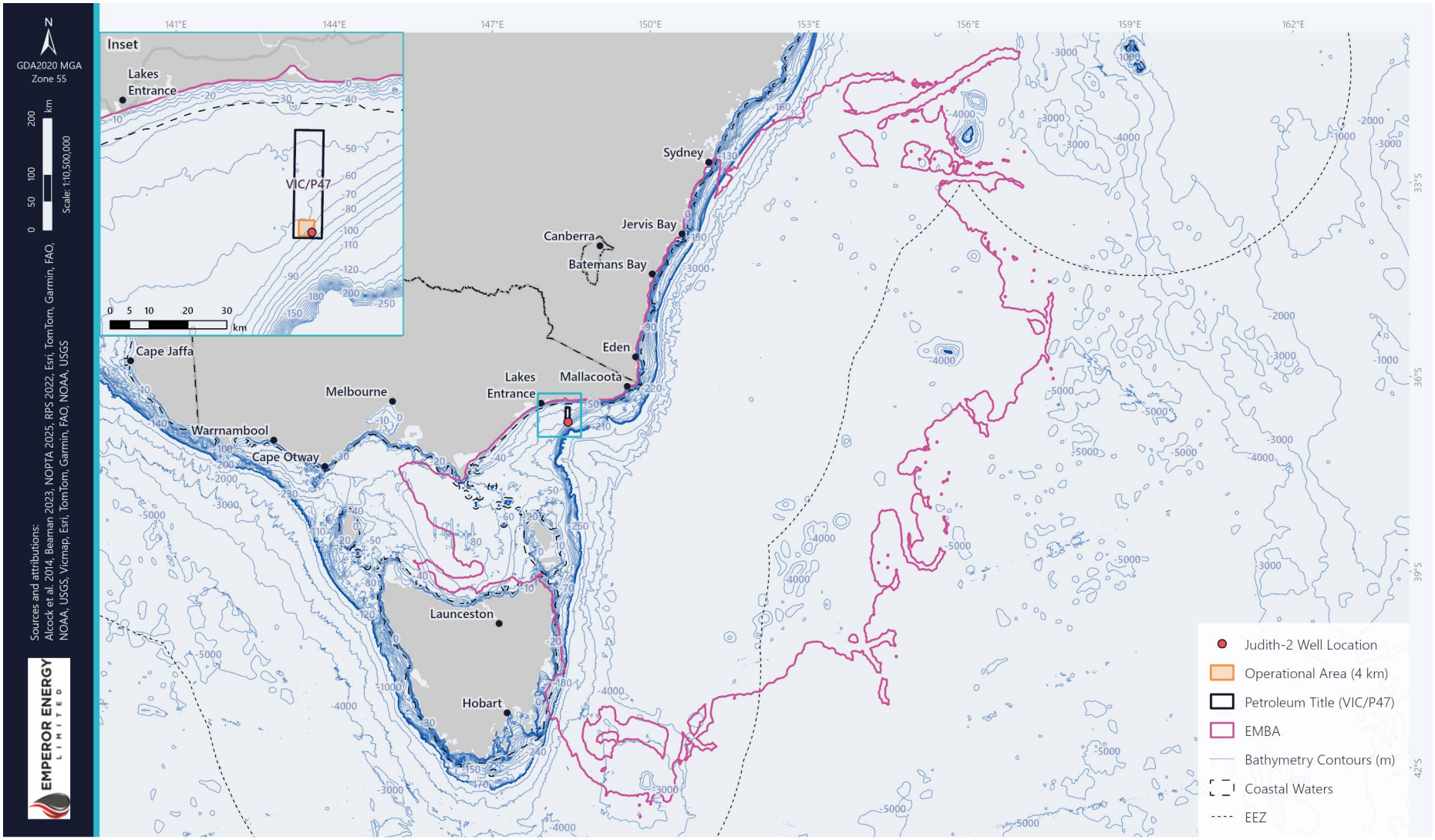


Figure 4-8: Bathymetry within the EMBA and Bass Strait

4.5.Ecological Environment

4.5.1. Benthic Habitats and Communities

Benthic communities are biological communities that live in or on the seabed. These communities typically contain light-dependent taxa such as algae, seagrass, and hard corals, which obtain energy primarily from photosynthesis (EPA, 2016). Other fauna, such as molluscs, crustaceans, sponges, or site-attached fish, also form part of a benthic community in that they obtain their energy by consuming other organisms and organic matter, but they are considered separately under the appropriate fauna receptor (Commercially Important Invertebrates – Section 4.5.1.1 and Fish – Section 4.6.3).

An extensive survey of the Bass Strait was undertaken between 1979 and 1983 to assess benthic fauna and sediments using acoustic swath mapping, seabed sampling, underwater video footage survey methods (Geoscience Australia, 2006). Environmental variables including longitude and water depth were important gradients, followed by percent of sand and mud, which were shown to influence the composition of benthic assemblages in the region. Video footage from the New Zealand Star Banks (~100 north-east of the Operational Area) showed that there was a high degree of variability in biota within a small area, as well as between sample sites. Surveys have also shown that hard grounds in the area attract fish, which are increasingly targeted by commercial fisheries (Geoscience Australia, 2006).

The New Zealand Star Bank is a large reef system within the eastern Bass Strait and lies within the EMBA (100 km north east of the Operational Area). Benthic habitat mapping of the New Zealand Star Bank showed that the area featured hard-ground features related to high-relief Devonian granite outcrops associated with diverse and abundant sessile and motile fauna (Beaman et al., 2005). The seabed features highly diverse fauna on the reefs which include sponges, bryozoans, soft corals, sea whips, crinoids, echinoids, fish, and other less abundant fauna (Geoscience Australia 2006). Distribution of the biota on the reef system is influenced by sediment types. The unconsolidated sediment on the flat seabed is associated with sparse sponges on the inner shelf, while the middle shelf and seaward flat and muddy seabeds support infauna communities. Unconsolidated sediments on the low-relief seabed are associated with an increase in density and sizes of sponges (Beaman et al., 2005).

The Gippsland Region comprises of a series of sediment flats and gravels, with small interspaced patches of reef. A survey conducted by Bax and Williams (2001) on the south-eastern Australian continental shelf, surveyed seabed habitats in proximity to the Operational Area with transects extending in depths out to the continental shelf along the Gippsland coast (Figure 4-9). Data collection methods included sediment samples, underwater video transects, information on seabed habitats from commercial and recreational fishers, and published data and maps on seabed sediments and substrate geology (Bax & Williams, 2001). Soft sediments of the area were primarily composed on sands, with gravels making up a higher proportion in the south. Inner-shelf sediments composed of well to medium sorted quartoze sands were generally less stable and influenced by water currents and storm events. Outer shelf sediments of bryozoan sands and gravel cover extensive areas of the out-er shelf were more stable with higher levels of bioturbation. Mud zones in the area occur off river mouths (e.g. Lakes Entrance and Lake Tyres) (Bax & Williams, 2001).

The study showed there was a high correlation between carbonates and organic matter, with higher levels of organic matter found at sites with high levels of carbonate. Main limestone regions in the area include How and Gabo Reef, Broken Reef, and major elongate outcrops adjacent to the Gippsland coastline. Quartz-rich, coarse grained sandstone tabular slabs also occur adjacent to areas of soft sediment along the Gippsland coastline (Bax & Williams, 2001).

Video transects from the survey from Bax and Willams (2001), sampled areas across the Gippsland region, with Transect B (~18 km from Operational Area) and Transect C (~50 km from Operational Area) (Figure 4-9). A map of sediment types in Gippsland is displayed in Figure 4-10, and pictures of substratum from the video transects are displayed in Figure 4-11.). Transect B showed poorly sorted, unconsolidated, thin mud over shell fragments. Slight slope. Sparse to dense mollusc beds including *Pecten* spp., *Chlamys* spp., and *Maoricolpus roseus* at the 40 m depth (B2). The 80 m depth (B3) showed thick semi to well consolidated mud, a slight slope, sparse ascidians, dense worm tubes, occasional soft coral, and bioturbation with some burrows and excavations. Transect C at 40 m depth (C2) showed unconsolidated sand bottom, no slope, medium ripples, shell fragments in troughs, sparse *M. roseus*, and occasional bioturbation. The 80 m depth (C3) showed semi-consolidated thick mud with organic debris, slight slope, intermediate worm tubes, occasional seastar, ball sponge, stalked ascidians (*Pyura sp.*), soft bryozoans and hermit crabs (Bax & Williams, 2001).

The Bax and Willams (2001) study correlates other studies in the area, which demonstrate that the sparse benthic assemblage distribution is influenced by more than just seabed habitat, but the distribution of fish and invertebrate communities is also influenced by latitude, depth and hydrology. Both invertebrate and fish communities in this area are correlated with depth and three communities can be distinguished (inner-shelf <40 m, outer-shelf 40–160 m, and shelf-break >160 m), although the overlap between invertebrate and fish communities is not exact. Many fish species extend over several of these fish communities, but for most of the abundant species, larger individuals are more abundant offshore in deeper water (Bax & Williams, 2001).

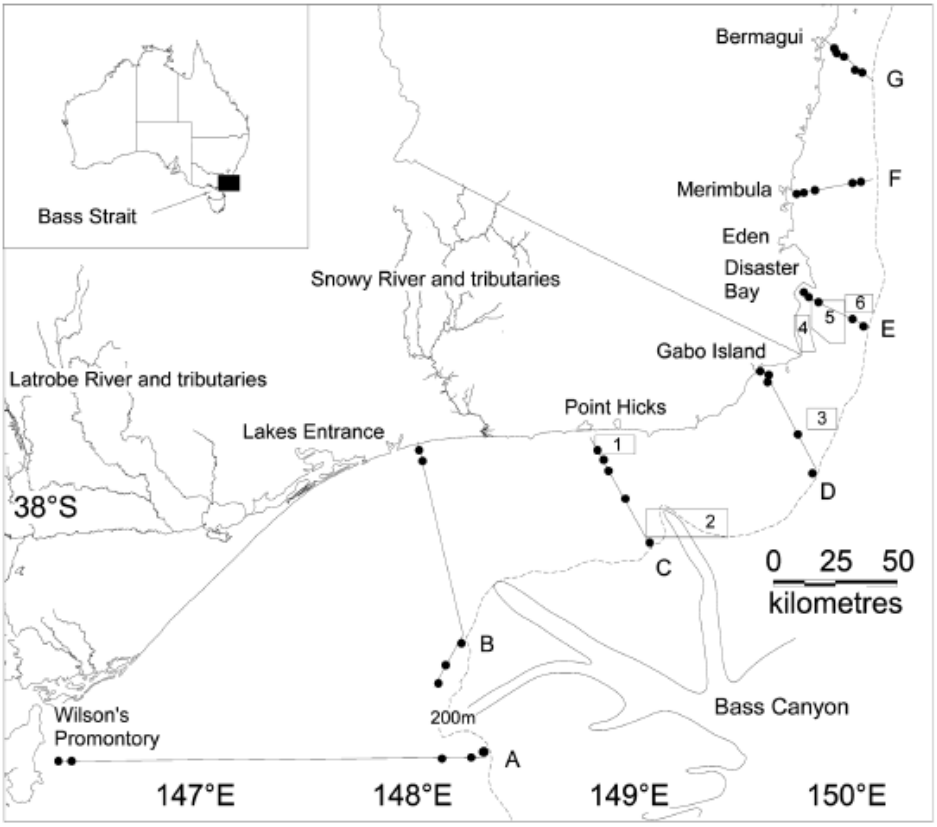


Figure 4-9: Video transects lines (Bax & Williams, 2001)

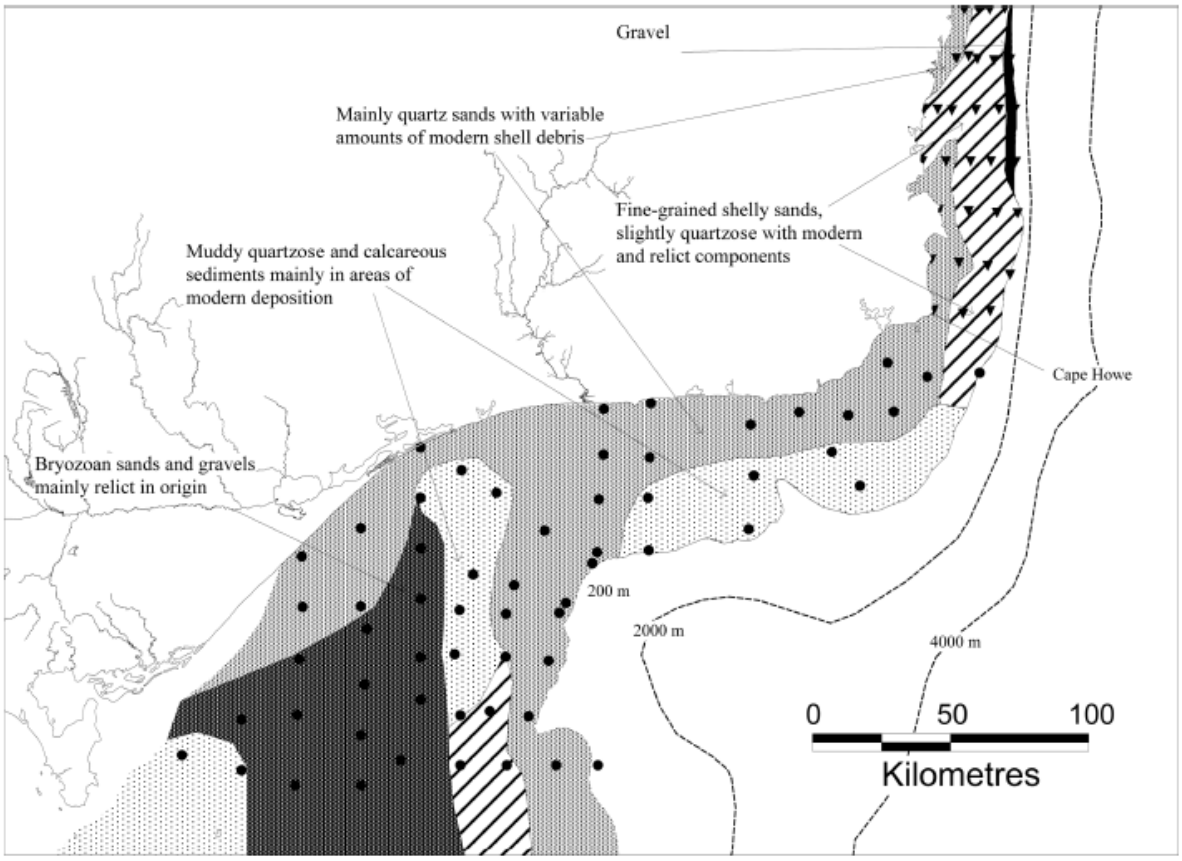


Figure 4-10: Map of sediment types in Gippsland (Bax & Williams, 2001).

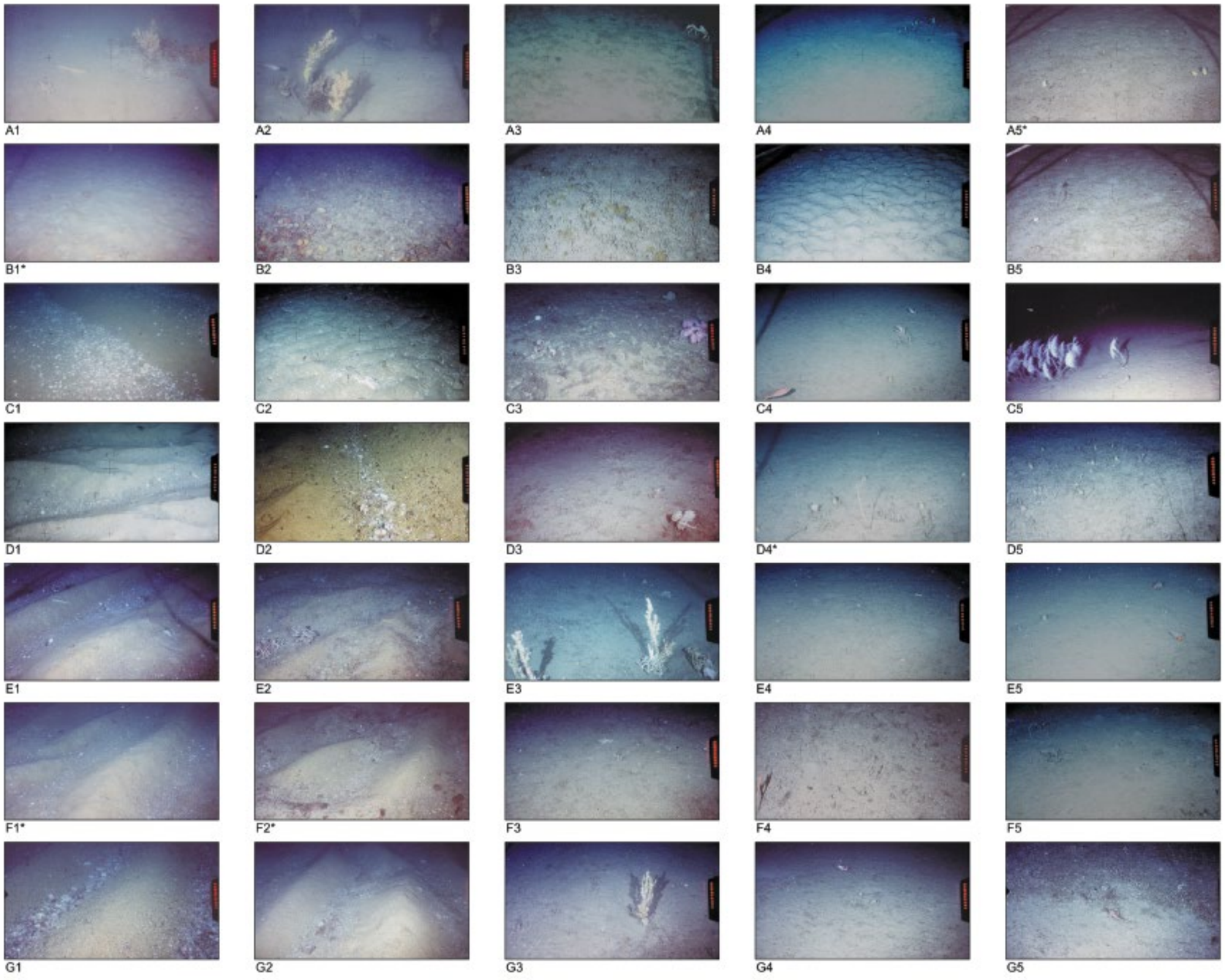


*Figure 4-11: Representative picture of substratum at each provincial scale sampling station. First letter in picture identifier is transect (see Figure 4-9); second is cross-shelf position (depth): 1(25 m); 2(40 m); 3(80 m); 4(120 m); 5(~200 m). *, indicative, based on video footage but taken at an adjacent station. (Bax & Williams, 2001)*

A 2003 geo-acoustic survey was undertaken by Amplitude Energy (Previously named Cooper Energy) in the nearby Sole development title (VIC/L32), approximately 30 km from the petroleum exploration title VIC/P47, for this activity, to characterise the bathymetry, seabed features, shallow geology, sediments and benthic habitat (OMV, 2003). The key survey findings included:

- Bathymetry is generally gentle sloping between water depths of 14.7 m approx. 200 m south of the Sole HDD beach crossing and 125.8 m at the Sole-3 location.
- Featureless seabed comprised of clays, silts, sands and gravel and some consolidated bedded sediments.
- Average seabed slopes along the proposed pipeline route do not exceed 0.25° (1:230). From the available bathymetry data, the seabed topography along the proposed pipeline route does not appear to contain significant cross slopes exceeding 10° (1:5.7).
- Poorly to well-defined mega ripples and uneven surfaces were identified in a number of places along the proposed pipeline route. Mega ripples are characterised by wavelength of less than 5 m to approximately 20 m, amplitudes less than 0.30 m and crest generally trending northeast suggesting a northwest to southeast primary current orientation.

A video survey was also undertaken in 2002 along the Patricia-Baleen extension pipeline located in the Gippsland Basin (CEE, Consultants, 2003). The survey indicated that large epibiota are very sparse and extensive areas of sandy and shell/rubble seabed are devoid of large epibiota except for introduced screw shells and sponges.

One EPBC Act listed endangered species of coral, *Dendronephthya australis* (Cauliflower soft coral) is known to occur within the EMBA. *Dendronephthya australis* is common at depths below 20 m in fast flowing estuarine environments. This species occurs in abundance in Port Stephens and Hawkesbury River, and has been recorded in Sydney Harbour, Botany Bay and Jervis Bay. Distribution of this species within the EMBA is confined to estuarine environments in NSW where it provides important habitat for a range of fish species (TSSC, 2020).

Based on the above survey information, it is expected that the benthic habitat in the Operational Area is comprised of sandy substrate, sparse epifauna (e.g. sponges) and infauna. One of the objectives of the activity is to obtain further information on the benthic habitat and communities in the Operational Area via the seabed surveys (as described in Section 3.4).

4.5.1.1. Commercially Important Invertebrate Species

Australia's oceans host a large diversity of marine invertebrates. The varied seabed habitats support a range of benthic communities and species diversity however knowledge of these habitats and communities is limited, particularly in deeper waters (DNP, 2013). Commercially significant invertebrate species that may occur within the EMBA are described in this section.

Abalone

Blacklip Abalone (*Haliotis rubra rubra*) and Greenlip Abalone (*Haliotis laevigata*) are commercially important reef-dwelling species widely distributed across tropical and temperate coastal areas. Abalone are single shelled with a fleshy body and muscular foot which they use to attach to hard substrate, typically in water depths of 5-10 m however they can be found in depths up to 40 m (DPI, 2024). A distinguishing feature of this genus is their rows of small holes or 'pores' along the edge of their shells where the organism will expel water that has passed through its gills (DPIRD, 2016). Females produce and release millions of eggs each year into the water column, where they are fertilised by sperm released by males. Fertilised eggs hatch into

larvae and after about a week the larvae develop into small juveniles which settle onto rocks (DPIRD, 2016). After settlement, juvenile abalone hide under rocks during the day only emerging in the night to feed. Once abalone reach sexual maturity (approximately 5-8 years old) most animals no longer engage in this behaviour and become sedentary, rarely moving more than a few hundred metres from their natal site (DNRET, 2022a). Evidence confirms that the Greenlip Abalone comprises numerous independent biological stocks at a spatially broad scale, even larger than the biological stock structure of the Blacklip Abalone (Stobart et al., 2023).

Stock status records show the Blacklip Abalone to be sustainable in 1 of 4 NSW stocks, 2 of 3 South Australian stocks and in all 4 Tasmanian stocks. Of the remaining stocks, 4 are determined to be depleting (VIC and NSW) and while the last is depleted in NSW. Stock status records show the Greenlip Abalone to be sustainable in 2 of 3 South Australian stocks and in the Tasmanian stock, while undefined in 3 other stocks (VIC, SA). Figure 4-12 and Figure 4-13 show the distribution of reported commercial catch of both species in south-eastern Australia (Mundy et al., 2023; Stobart et al. 2023) which indicates that they are likely to be present in the EMBA. No commercial catch is expected within the Operational Area because water depths exceed those typically associated with abalone habitats (approximately 40 metres) and are greater than the depths accessible for commercial diving operations. Although neither abalone species have EPBC status or an associated recovery or management plans, there are a range of anthropogenic threats that have the potential to affect them including:

- Commercial and recreational fishing, and
- Climate change (i.e. ocean acidification).



Figure 4-12: Distribution of reported commercial catch of Blacklip Abalone. (Mundy et al., 2023)



Figure 4-13: Distribution of reported commercial catch of Greenlip Abalone.

Commercial Scallop

Commercial Scallops (*Pecten fumatus*) are a commercially important species that can be distinguished from other scallops by their equal-sized circular shaped shells. This species is distributed throughout southern Australia, from mid NSW to mid-WA including Tasmania in depths between 1-120 m. Scallops are typically sedentary benthic organisms that aggregate into beds and can be found buried in soft sediment (mud and sand). Spawning is known to only occur after a two-year development period and is thought to be triggered by an increase in temperature. Commercial Scallops can release up to one million eggs into the water column during spawning.

There are four Commercial Scallop stocks in Australia: Bass Strait Central Zone Scallop Fishery, Port Phillip Bay Dive Scallop Fishery, Tasmanian Scallop Fishery and Victoria's Ocean Scallop Fishery. Stock status records show the species to be sustainable through the Commonwealth and Port Phillip Bay jurisdictions, recovering in Tasmanian jurisdiction stocks, and depleted in the Victorian Fisheries jurisdictions (Bromhead and Semmens 2023). However, since being closed in 2015 due to low stock the Tasmanian Scallop Fishery was approved to reopen in September of 2021 and has continued on with the 2022 season. Figure 4-14 shows the distribution of reported commercial catch of Commercial Scallop in south-eastern Australia (Bromhead and Semmens, 2023) which indicates it is likely to be present in the EMBA. As detailed in Table 4-20, only one reporting block shows activity within the Operational Area since 2013. In 2019, one vessel was active in the Operational Area for 1 day. There has been evidence of fishing effort within the Operational Area since 2019. Although, the Commercial Scallop does not have EPBC status or an associated recovery or management plan, there are a range of anthropogenic threats that have the potential to affect Commercial Scallops including:

- Commercial and recreational fishing, and
- Climate change (i.e. ocean acidification).



Figure 4-14: Distribution of reported commercial catch of Commercial Scallops. (Bromhead and Semmens, 2023)

Giant Crab

The Giant Crab (*Pseudocarcinus gigas*) is a commercially important species in the region that is endemic to the waters of southern Australia (DoE, 2014) (Figure 4-15). This species resides on muddy or rocky bottoms in waters of the Southern Ocean at depths from 18 to 600 m depth (Gardner and Welsford 2003, Poore 2004, Heeren and Mitchell 1997). Most commonly this species is found in the shelf break habitat associated with bryozoan substrates between 140 m and 270 m (Poor, 2004, Leon et al., 2017). The habitat of early juveniles has yet to be established, however there is some evidence that smaller individuals occur in deeper water (Williams et al 2009; Leon unpublished data). Additionally, bryozoan communities are rich in prey items suitable for juvenile crabs, suggesting that this particular habitat is likely to be important for the settlement and growth of giant crab (Levings, 2001). Williams et al. (2009) notes that Giant Crabs observed during surveys along the continental slope were using ledges and sponges for shelter. Given its habitat preferences and mapped fishing activity (edge of the continental slope), Giant Crabs are known to be present in deeper waters of the continental shelf slope in the EMBA but are not anticipated to be present in high numbers in the Operational Area due to the shallower water depths.

Giant Crabs feed on carrion and slow-moving benthic species including gastropods, crustaceans and starfish. They breed in June and July, and the females carry up to two million eggs for approximately four months. As hatching approaches (October to November), females are thought to migrate to the shelf-break (Currie and Ward 2009). Upon hatching, the larval duration is around 50 days with larvae release occurring at the edge of the continental shelf (FRDC, 2017). There is a strong capacity for larval dispersal over large spatial scales prior to settlement (PIRSA, 2002). Recruitment is not distributed evenly, with some areas having higher juvenile abundance than others, which is not a function of habitat but larval drift and ocean current movements (FRDC, 2018). Oceanographic modelling has demonstrated the species is of a single biological stock with larval dispersal occurring along the edge of the continental shelf and drifting with plankton for a 50-day period.

Female moulting peaks strongly in winter (June and July). Males moult in summer (November and December). Intermoult period estimates varied from 3 to 4 years for juvenile males and females, with rapid lengthening in time between moulting events to approximately 7 years for females and 4.5 years for males. Gardner (1998) reports that females appear to mate while soft-shelled with stored sperm remaining viable for at least 4 years; broods are produced annually although females occasionally skip a reproductive season, which may be associated with moulting, and several broods may be produced between moults although fecundity declines with successive broods.

The species key biological features (e.g. long-lived, slow growing) have the potential to leave the population vulnerable to decline (FRDC, 2018). While there is little scientific data on the population, stock status records show the species to be sustainable in WA, but depleting in SA and depleted in Victoria (Hartmann et al., 2023a). The Tasmanian stock status is classified as undefined (Hartmann et al., 2023a). The Giant Crab does not have EPBC status or an associated recovery or management plan. There are a range of anthropogenic threats that affect giant crabs including:

- Commercial and recreational fishing, and
- Ecosystem effects as a result of habitat modification and climate change.

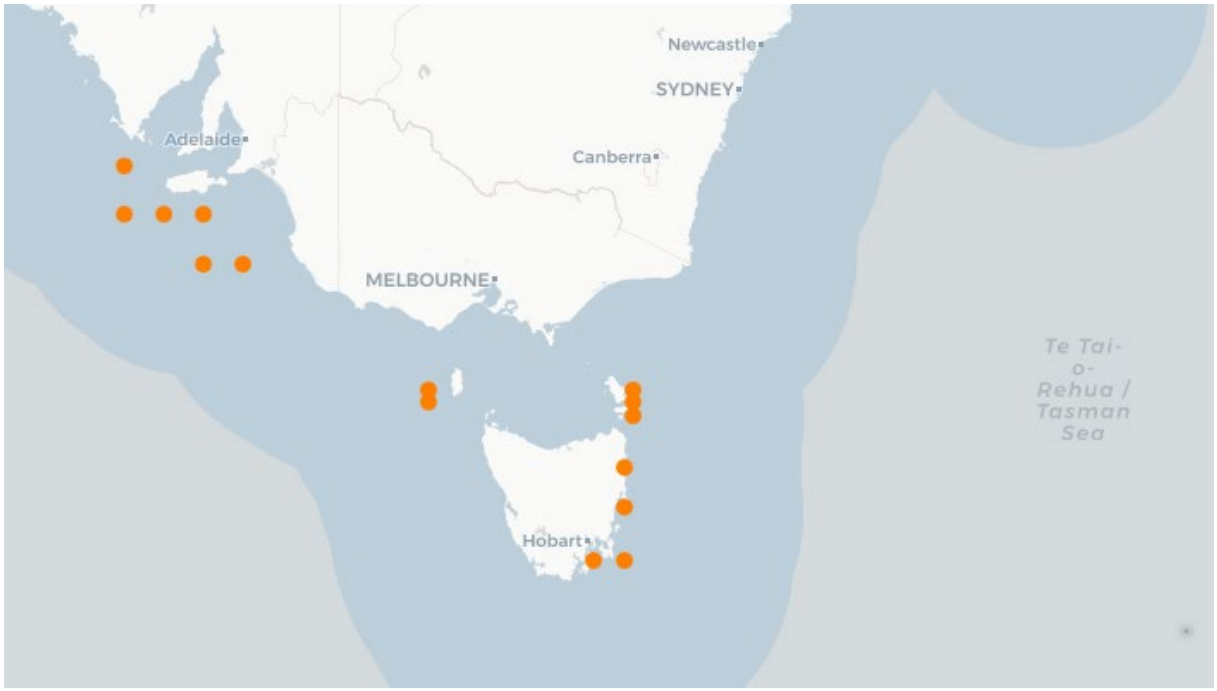


Figure 4-15: Distribution of reported commercial catch of Giant Crab. (Hartmann et al., 2023a)

Octopus

The Pale Octopus (*Octopus pallidus*) is a commercially important species found across the Great Australian Bight around Tasmania and towards southern NSW. They inhabit sand and mud substrates, often in association with sponge gardens or beds of large solitary sea squirts in depths up to 600 m (Atlas of Living Australia 2022a). This species hides during the day and feeds at night primarily on bivalves, which are pulled apart or drilled. The Pale Octopus lays large eggs that are attached to hard substrates and foraging begins immediately after hatching. Evidence suggests that there are a number of subpopulations within the Bass Strait due to limited species dispersal and isolation due to distance (Hartmann et al., 2023b).

Stock status records show the species to be depleting in the Tasmanian jurisdiction, undefined in the Victorian and SA jurisdictions and negligible in NSW due to historically low catch rates. Figure 4-16 shows the distribution of reported commercial catch of Pale Octopus in south-eastern Australia (Hartmann et al. 2023b) which indicates it is likely that they will be present within the Operational Area and EMBA. Although the Pale Octopus does not have EPBC status or an associated recovery or management plan, they may be affected by a range of anthropogenic threats. Key threats identified include:

- Commercial and recreational fishing, and
- Climate change.



Figure 4-16: Distribution of reported commercial catch of Pale Octopus. (Hartmann et al., 2023b)

Pipi

Pipi (*Donax deltoides*) are a commercially important species found on sandy beaches between southern QLD and the Murray River in SA and have been a culturally important species to First Nations people for thousands of years. Life expectancy for this species is between 4-5 years and like most bivalves this species filter feeds by extracting microscopic matter from the water column (Ferguson et al., 2023). Typically, Pipi reach sexual maturity towards the end of their first year and are then able to spawn year-round. East Australian and South Australian currents act as key drivers of gene flow on the east and south coasts of Australia which has resulted in high genetic variation between populations on either side of Bass Strait (Ferguson et al., 2023). As a coastal species, this species does not occur within the Operational Area but is present in sandy beaches within the EMBA.

Stock status records show the species to be sustainable through the NSW and SA jurisdiction while the Victorian jurisdiction is undefined. Figure 4-17 shows the distribution of reported commercial catch of Pipi in south-eastern Australia (Ferguson et al., 2023) which indicates it is likely that they will be present in the Planning Area. Although Pipi does not have EPBC status or an associated recovery or management plan, they may be affected by anthropogenic such as:

- Commercial and recreational fishing, and

- Climate change.

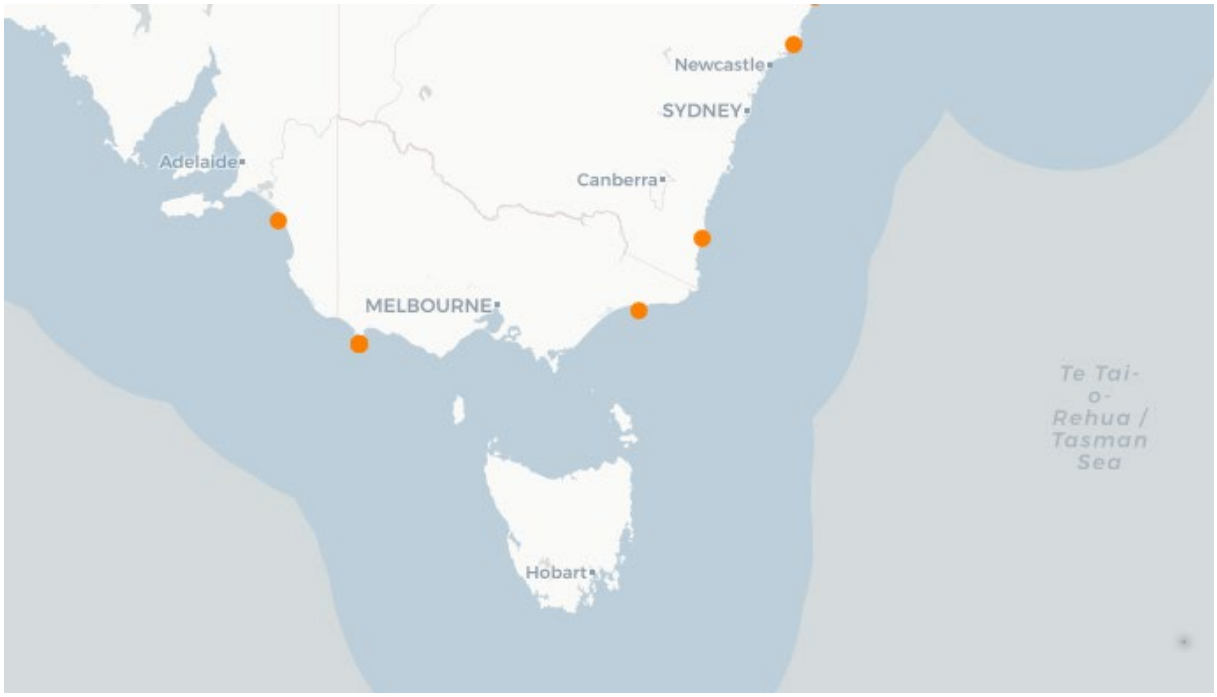


Figure 4-17: Distribution of reported commercial catch of Pipi. (Ferguson et al., 2023)

Southern Rock Lobster

The Southern Rock Lobster (SRL) (*Jasus edwardsii*) is a commercially important species that is found on coastal reefs from the south-west coast of WA to the south coast of NSW, including Tasmania and the New Zealand coastline (Error! Reference source not found.). SRL are found in depths up to 150 m (DPI, 2009). In Victoria, the abundance of SRL decreases from west to east reflecting a decreasing area of suitable rocky reef habitat (DPI, 2009).



Figure 4-18: Distribution of reported commercial catch of Southern Rock Lobster. (Linnane et al., 2023)

Most adult SRL remain within the same region (moving less than 1 km), though some tagged SRL have moved more than 80 km between inshore and offshore reefs (SRL, 2021). More broadly in the region, SRL habitat occurs as patchy, discontinuous low-profile reef running parallel to the coast. Bathymetry mapping, including recent shelf mapping of the Zeehan Multiple Use Zone funded by Parks Australia found the existence of multiple marine canyons in the area as well as areas of deep reef extending across the shelf from the shelf-break. The outer shelf region is limestone reef pavement that becomes significantly more fractured with notable long step-features which were rarely undercut limiting habitat available for crevice-dwelling species such as the SRL (Barrett et al. 2023). Preliminary research in the area has found that while multibeam sonar mapping has identified areas of suitable reef, 300 camera drops identified no lobsters which is likely due to the absence of suitable crevice-like habitat (Barrett et al., 2023). Therefore, the Zeehan Multiple Use Zone is likely low-quality habitat (Barrett et al. 2023) for the SRL at ecologically or commercially important levels. It is assumed that where rocky reef is located within the EMBA, SRL are likely to be present.

Adult SRL are carnivorous and feed mostly at night on a variety of bottom dwelling invertebrates such as molluscs, crustaceans and echinoderms. The main predators of SRL are octopus, sharks and reef fish such as wrasse and ling (SRL, 2021).

The life cycle of the SRL is complex. After mating between April and July (SRL 2021), fertilised eggs (up to 1,000,000 per female) are carried under the tail of the female for approximately 4-6 months before being released, typically between September and November. Larval release occurs across the southern continental shelf, which is a high-current area, facilitating dispersal. Oceanographic modelling has also indicated that SRL dispersal occurs over large spatial scales, indicating that there is a single biological stock (Bruce et al. 2007). Genetic analyses also indicate that it is a single stock (Ovenden et al., 1992).

Once released, SRL larvae, or phyllosoma, undergo 11 developmental stages over a period of 12 and 24 months (Hartmann et al., 2013; SRL, 2021) while being carried by ocean currents up to 200 km offshore far beyond the continental shelf. At the end of this developmental phase, phyllosoma larvae moult and metamorphose into a puerulus larvae (a transparent miniature version of the adult), still living in the water

column but not feeding (SRL, 2021). Successful metamorphosis from the final-stage phyllosoma to puerulus stage occurs far offshore sometimes even beyond the continental shelf (SRL 2021). The puerulus swim inshore at night to settle onto reef habitat in depths from 50 m to the intertidal zone (Booth et al. 1991) where they moult into pigmented juvenile lobsters (SRL, 2021). Bruce et al. 2007 reported data for state-maintained puerulus collector sites, which indicates that most puerulus settlement in NW Tasmania occurs June through August, tapering off in September.

SRL grow by moulting or shedding their exoskeleton. Juvenile lobsters moult approximately 5 times per year, declining to once a year for mature adults. Research on temporal moulting patterns in adult SRL in Tasmanian waters including King Island (Gardner and Mills, 2013), which tracked over 4,000 tagged individuals, found females mainly moult between February and May while males moult mainly in August and September with the greater majority moulting in August. The Tasmanian Seafood Industry Council (TSIC) advised that moulting for adult males occurs in September and October. Males grow faster and larger than females, reaching 160 mm in carapace length after ten years. Females generally reach 120 mm in the same period. Growth rates also vary spatially, with growth faster in the east than in the west (DPI 2009). It can take between 3 and 10 years for SRL to reach commercial fishing size (SRL, 2021).

Although rock lobsters have no formal protection under Australian law, Hayes et al. (2021) identified SRL as a key natural value for the South-East marine park network. The key natural values were identified by subject matter experts using a set of criteria developed from the criteria used to identify equivalent or similar concepts in other national and international contexts. Each key natural value is allocated to an ecosystem within the common language and thereby mapped.

The SRL does not have an EPBC status or associated recovery or management plan. While there is little scientific data on the population, stock status records indicate that the southern Australian stock is sustainable (Linnane et al. 2023). However, the stock status is only marginally above the limit reference point for egg production. The populations of SRL in the north-west of Tasmania are characterised by larger individuals and faster growth than much of the rest of the state. The Tasmanian stock assessment area that incorporates King Island and part of the AMP has the second lowest biomass in Tasmania, as well as the lowest egg production in the state (Hartmann, 2022).

Surveys of commercial fishers operating in and around the ZMP, as well as analysing commercial rock lobster catch data in the region, identified that most of the fishing reported occurred in waters closer to King Island than the marine park offshore (UTAS, 2023). Surveys also identified that the aggregate catches recorded in fishery reporting blocks overlapping the ZMP were low relative to other areas, implying an overall low population density within the park. A review of catch data showed that catch in tonnes appears to have remained steady since 2008 for both the Tasmanian and Victorian fishing blocks.

Pressures on SRL populations include fishing, climate change, with respect to declining individual performance with warming, potential future competition with conspecific lobsters, and future interactions with the range-extending destructive sea urchin (UTAS, 2023).

Squid

Gould's Squid (*Nototodarus gouldi*) are a commercially important species typically found at depths from 50 – 200 m off the subtropical and temperate coasts of Australia (Atlas of Living Australia, 2022b). Gould's Squid feed on crustaceans, fish and cephalopods at night and in turn are prey for birds, large fish, sharks and marine mammals (O'Sullivan and Cullen 1983). Gould's Squid are short lived (less than one year), spawn multiple times during their life cycle, and display highly variable growth rates, size and age at maturity (Jackson and McGrath-Steer, 2003).

Noriega et al (2023) highlights characteristics of the Gould's Squid's lifecycle which lend itself to rapid increases in biomass during favourable environmental conditions, making it less susceptible to becoming overfished than longer-lived species. The species is commercially harvested and the population size from year to year. This is primarily due to its short life cycle, the 'boom and bust' nature of its population dynamics and life history characteristics. Figure 4-19 shows the distribution of reported commercial catch of Gould's Squid in south-eastern Australia (Noriega et al., 2023) which indicates it is likely that Gould's Squid will be present in the EMBA.

There is no formal stock assessment available for the population, however stock status records show the species in south-eastern Australia to be of a sustainable level (Noriega et al., 2023). However, there are a range of anthropogenic threats that affect the population including:

- Commercial and recreational fishing, and
- Ecosystem effects as a result of habitat modification and climate change.

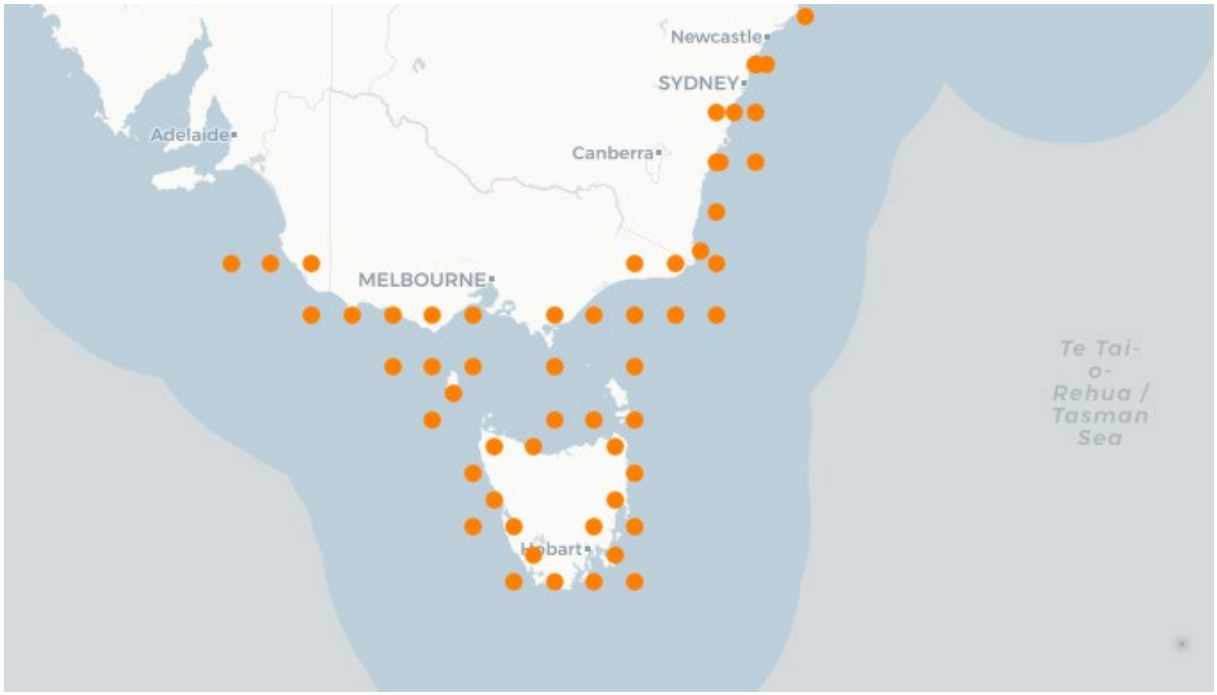


Figure 4-19: Distribution of reported commercial catch of Gould's Squid. (Noriega et al., 2023)

4.5.2. Macroalgae

Seaweeds or marine benthic macroalgae are generally found on in nearshore waters and play a major role in near-shore ecology in Australian coastal areas by serving as a habitat, source of food and substrate stabiliser (Huisman and Baldock, 2018). At least 12,000 marine and freshwater and terrestrial species are thought to occur in Australia (McCarthy, 2007). The temperate southern coast of Australia is recorded as a well-known global hot spot for seaweed diversity with a broad range of taxa recorded in the region (Huisman and Baldock 2018).

Macroalage is divided into three groups, algae (*Phaeophyceae*), red algae (*Rhodophyta*), and green algae (*Chlorophyta*). Brown algae are usually the most visually prominent species and forms canopy layers. Throughout temperate regions of Australia, the algae *Sargassum* spp., *Caulerpa* spp., and *Ecklonia radiata* are prominent components of the marine flora. Along the southern coastline, *Cystophora* spp. and *Acrocarpia* spp. are frequently observed. The upper sublittoral zone from western South Australia to

southern New South Wales, including Tasmania, is largely characterised by *Durvillaea potatorum* and *Phyllospora comosa*. *Macrocystis angustifolia* is a distinctive feature of the coastal environment in Victoria and northern Tasmania. In contrast, south-eastern Tasmanian waters commonly support *Xiphophora gladiata*, *Caulocystis cephalornithos*, and *Lessonia corrugata* in shallower areas, while *Macrocystis pyrifera* tends to occur at mid-water depths (Sanderson, 1997).

Kelps are large brown algae that grow in cool temperate rocky reefs at depths > 8 m The Giant kelp Marine Forests of South East Australia Threatened Ecological Community (TEC) is located in the south eastern waters is described in Section 4.7.2. Macroalgae within the EMBA is detailed within Error! Reference source not found..



Figure 4-20: Presence of Macroalgae, Seagrass, Mangrove and Saltmarsh Habitat within the EMBA

4.5.3. Seagrass

There are approximately 30 species found in Australian waters (Huisman, 2000). Seagrasses are marine angiosperms that grow in nearshore marine and estuarine environments of water depths of 2-12 m, where sunlight intensity is the highest. Seagrasses are an important habitat and food for benthic fauna, which in turn supports fish, birds and crustacean species. They also stabilise sediments and enhance habitats by providing a nursery ground for juvenile fish. Fish diversity has been recorded as being higher in areas that contain seagrass in comparison to non-vegetated areas in Victoria. The larval species of some fish including blue rock whiting, King George whiting, leatherjackets and flatheads have been found to favour seagrass meadows (Blake and Ball 2001). The dominant temperate species in the EMBA are *Amphibolis antarctica*, *Halophila australis*, *Heterozostera tasmanica*, *Posidonia australis*, *Posidonia angustifolia* and *Zostera muelleri* (Kirkham, 1997).

Areas of known seagrass located within the EMBA include Corner Inlet and Lakes Entrance in Victoria, and along various inlets and estuaries along the NSW coast (Lucieer, 2017). Seagrass within the EMBA is detailed within Error! Reference source not found.. One TEC is located within the EMBA, the *Posidonia australis* Seagrass Meadows of the Manning-Hawkesbury ecoregion and is described in Section 4.7.2.

4.5.4. Mangrove

Mangroves are marine flowering plants that have roots, stems and leaves and are adapted to growing in salt water in intertidal areas of mud and sand. Mangroves have specially adapted aerial peg roots called pneumatophores that allow gas exchanges to occur at low tide. Mangroves play an important role in biodiversity providing a habitat for birds, fish crustacean, and invertebrate species, including recreationally important species (McClatchie et al., 2006).

Victoria has approximately 512 km^2 of mangroves across the central coastline with those at Nooramunga Marine and Coastal Park and Cunninghame Arm at Lakes Entrance situated within the EMBA Error! Reference source not found.. The southernmost mangroves in the world are located at Millers Landing in Wilsons Promontory National Park (38° 45' S). Low temperatures and frost limit the distribution and growth of these species with White Mangroves being stunted at less than 2m tall, in comparison to White Mangroves in tropical areas which can grow to over 10 m in height (Parks Victoria, 2011). Additional mangroves occur at The Barwon River estuary, Limeburners Lagoon Kororoit Creek, Jawbone Marine Sanctuary, Stony Creek Backwash, Western Port, Andersons Inlet, Corner Inlet and Swan Island Queenscliff but are situated outside of the Operational Area.

4.5.5. Saltmarsh

Coastal saltmarshes are intertidal communities dominated by flowering plants, herbs and low shrubs which occur in a range of brackish and saline estuarine, lagoons and sheltered open coastlines along Australia. The upper limit of saltmarsh is set by the level of the highest tide. They are recognised as ecosystems of high ecological value to coastal ecology by serving as a habitat for fish, invertebrates, migratory birds, bats and other mammals (Saintilan, 2009).

The prominent species found along south-eastern Australian coastlines is *Selliera radicans* and *Isolepis cernua*, with less common species such as *Limosella australias* found along the south coast of NSW. In contrast to mangroves, species richness of saltmarsh increases in temperate latitudes with the highest number of species being recorded in Tasmanian marshes. *Sporobolus virginicus* and *Sarcocornia quinqueflor*a are the most widely distributed saltmarsh plans in Australia and occur along the coastlines

within the EMBA (Saintilan, 2009). Saltmarsh distribution within the EMBA is detailed within Error! Reference source not found..

The Subtropical and Temperate Coastal Saltmarsh TEC is located within the subtropical and temperate climatic zones south of the South-east QLD, within the EMBA and described in in Section 4.7.2.

4.5.6. Sandy and Rocky Shorelines

Sandy shorelines create a dynamic interface between the land and sea and are home to an abundant array of microscopic and macroscopic species (Parks Victoria, 2003). The coast is dominated by dunes and sandy shorelines, with occasional rock outcrops; and there are extensive areas of inshore and offshore soft sediments (Barton et al. 2012). Sandy shorelines are common along the Victorian coastline, including popular beaches found at Ninety Mile Beach (Parks Victoria, 2003).

Rock shorelines in this region are composed of rocks of granite, limestone and basalt which may be exposed or submerged depending on the tide. Intertidal shorelines can support a multitude of species which vary across the Victorian coastline, depending on the exposure to waves, rock type, and the presence of rock pools, crevices or boulders. This region also has occasional low-relief reef immediately beyond the surf zone (7-25m deep). Rocky shorelines provide important habitat to a variety of invertebrate and marine plant species Rocky shorelines can be found along the NSW coastline, Bass Strait and some of Victoria's coastline including Point Hicks Marine National Park and Wilsons Promontory (Parks Victoria, 2003). Sandy and Rocky Shorelines within the EMBA are detailed within Figure 4-21.

4.5.7. Plankton

Plankton consists of both flora (phytoplankton) and fauna (zooplankton) and are found throughout nearshore and open waters and are typically more abundant in surface waters. Species distribution is often patchy and is largely dependent on tide driven currents and winds. Plankton's inability to influence their movement patterns results in high natural rates of loss and regeneration (Richardson et al., 2017). Plankton make up a key component of the marine ecosystem food chains, providing a food source for a variety of fauna, including barnacles, sea squirts, large sharks and whales.

The EMBA is located within an area identified as the upwelling east of Eden, a key ecological feature related to eddies which originate from the East Australia Current. These eddies can move into the Gippsland region and drive episodic mixing, nutrient enrichment and blooms of phytoplankton, increased zooplankton and fish.

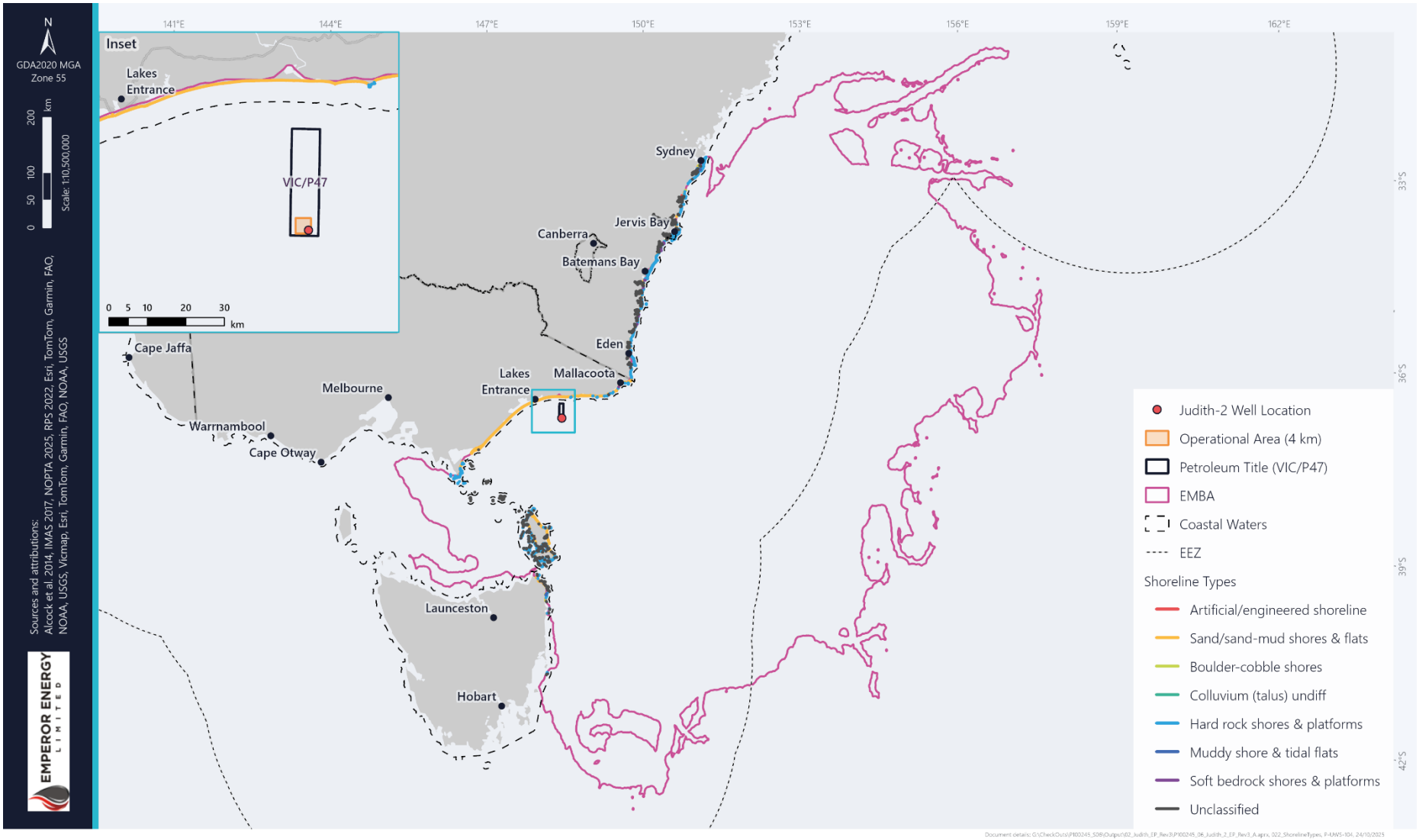


Figure 4-21: Presence of Sandy and Rocky Shorelines within the EMBA

4.6. Threatened and Migratory Species

To identify threatened and/or migratory listed species that may be affected the planned or unplanned activities, a series of PMST reports were conducted and are presented in APPENDIX B .

Part 13 of the EPBC Act indicates species can be listed as one, or a combination of the following designations:

- Threatened
- Migratory
- Whale or other Cetaceans
- Marine.
- Biologically Important Areas

4.6.1. Biologically Important Areas

Biologically Important Areas (BIAs) are specific regions of the marine environment, defined spatially and temporally, where protected marine species perform critical life functions (DCCEEW 2024a). These areas are identified based on their regular or repeated use by individuals or groups of a single species, stock, or population for activities such as reproduction, feeding, migration, or resting (DCCEEW 2024a).

While BIAs are under constant review by the Australian Government to consider the spatial-temporal distribution of species, this EP has used the best available technologies at the time of writing to ensure that all impacts and risks to threatened and/or migratory listed species have been considered. Emperor Energy will ensure any changes to these species are accounted for following the MOC process outlined in Section 8.10.

Threatened or migratory species with BIAs that overlap the Operational Area and EMBA listed in Table 4-3 and are discussed in Sections 4.6.2 to 4.6.5.

There are no areas defined as Habitats Critical for the Survival of Marine Species within any of the EMBAs.

Table 4-3: BIAs within the Judith-2 EMBAs

COMMON NAME	SCIENTIFIC NAME	OPERATIONAL AREA	IMPULSIVE NOISE	CONTINUOUS NOISE	LIGHT EMBA (20 KM)	FLARING EMBA (63 KM)	MDO EMBA	EMBA
Birds								
Antipodean Albatross	*Diomedea exulans antipodensis*	-	-	-	F	F	F	F
Black Petrel	*Procellaria parkinsoni*	-	-	-	-	-	F	F
Black-browed Albatross	*Thalassarche melanophris*	F	-	-	F	F	F	F
Black-faced Cormorant	*Phalacrocorax fuscescens*	-	-	-	-	-	F B	F B
Bullers Albatross	*Thalassarche bulleri*	F	-	-	F	F	F	F
Campbell Albatross	*Thalassarche melanophris impavida*	F	-	-	F	F	F	F
Common Diving-Petrel	*Pelecanoides urinatrix*	F	-	-	F	F	F B	F B
Flesh-footed Shearwater	*Ardenna carneipes*	-	-	-	-	-	F	F
Greater Crested Tern	*Thalasseus bergii*	-	-	-	-	-	F B	F B
Great-winged Petrel	*Pterodroma macroptera*	-	-	-	-	-	F	F
Indian Yellow-nosed Albatross	*Thalassarche chlororhynchos bassi*	F	-	-	F	F	F	F
Little Penguin	*Eudyptula minor*	-	-	-	-	-	F B	F B
Northern Giant Petrel	*Macronectes halli*	-	-	-	-	-	F	F
Short-tailed Shearwater	*Ardenna tenuirostris*	-	-	-	-	F	F B	F B
Shy Albatross	*Thalassarche cauta cauta*	FL	-	-	FL	FL	FL	FL
Soft-Plumage Petrel	*Pterodroma mollis*	-	-	-	-	-	F	F
Sooty Shearwater	*Ardenna grisea*	-	-	-	-	-	F B	F B
Southern Giant Petrel	*Macronectes giganteus*	-	-	-	-	-	F	F
Wandering Albatross	*Diomedea exulans*	F	-	-	F	F	F	F
Wedge-tailed Shearwater	*Ardenna pacifica*	-	-	-	-	-	F B	F B
White-capped Albatross	*Thalassarche cauta steadi*	-	-	-	-	-	F	F
White-faced Strom Petrel	*Pelagodroma marina*	-	-	-	F	F	F B	F B
White-fronted Tern	*Sterna striata*	-	-	-	-	-	F	F B
Wilsons Storm Petrel	*Oceanites oceanicus*	-	-	-	-	-	MR	MR

COMMON NAME	SCIENTIFIC NAME	OPERATIONAL AREA	IMPULSIVE NOISE	CONTINUOUS NOISE	LIGHT EMBA (20 KM)	FLARING EMBA (63 KM)	MDO EMBA	EMBA
Sharks								
White Shark	*Carcharodon carcharias*	-	-	-		B	F B	A F B
Grey Nurse Shark	*Carcharias taurus*	-	-	-		-	F MR	F MR
Cetaceans								
Southern Right Whale	*Eubalaena australis*	MR	-	-	-	-	MR B	MR B
Pygmy Blue Whale	*Balaenoptera musculus brevicauda*	F	F	F	F	-	F	F
Humpback Whale	*Megaptera novaeangliae*	-	-	-	-	-	F	MR
Indo Pacific Spotted Bottlenose Dolphin	*Tursiops aduncus*	-	-	-	-	-	B	B F

Type of BIA:
F – Foraging
FL – Foraging Likely
B – Breeding
MR – Migration
A – Aggregation

4.6.2. Seabirds and shorebirds

Seabirds, which are birds that are adapted to life in the marine environment; can be highly pelagic, coastal, or in some cases spend a part of the year at sea entirely. These species include albatrosses, petrels, and shearwaters. Shorebirds (or waders) inhabit the shorelines of coasts and inland water bodies for most of their lives including sandpipers and plovers.

Migratory bird species in Australia are protected under several international treaties and agreements, including, the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), the Ramsar Convention on Wetlands, the Agreement on the Conservation of Albatrosses and Petrels, and through the East Asian – Australasian Flyway Partnership (the Flyway Partnership). The Australian Government also has bilateral migratory bird agreements with Japan (Japan-Australia Migratory Bird Agreement, JAMBA), China (China-Australia Migratory Bird Agreement, CAMBA), and the Republic of Korea (Republic of Korea-Australia Migratory Bird Agreement, ROKAMBA). In Australia the *Environment Protection and Biodiversity Conservation Act 1999* gives effect to these international obligations.

Several bird species are listed as threatened and/or migratory under the *Environment Protection and Biodiversity Conservation Act 1999*. These species are considered a matter of national environmental significance. Species may also be protected under state and territory environmental legislation. All EPBC Act listed threatened and migratory bird species within the EMBA are listed in Table 4-4.

Additionally, within the EMBA there are certain species that exhibit biologically important behaviours, such as foraging, breeding or migrating which are crucial to the species success. There are 24 seabirds and migratory shorebird species which have BIAs overlapped by the EMBA. BIAs have been listed in Table 4-3.

Several species identified by the PMST to occur within the EMBA are terrestrial species and are not likely to inhabit coastlines or rely on the marine environment for breeding or foraging. These species are not considered to be credibly impacted by activities within this EP and have been excluded from this section and impact assessment. However, full PMST reports for all EMBAs are listed in APPENDIX B .

Numerous seabird and shorebird species use the Gippsland region and may pass over the Operational Area or EMBAs, utilising the East Asian-Australasian Flyway (EAAF). Spanning over 13,000 km and 22 countries, the EAAF is one of the world's most important migratory bird routes, supporting over 50 million waterbirds annually (CoA, 2017b; Hansen et al., 2016). There are currently 900 sites recognised as internationally important to migratory waterbirds along the flyway. The Operational Area and EMBA are in proximity to seven of these sites, including:

- Hunter Estuary Ramsar Site
- Port Phillip Bay (Western Shoreline)
- Bellarine Peninsula
- Western Port, Shallow Inlet Marine and Coastal Park
- Corner Inlet
- Orielton Lagoon
- Logan Lagoon

According to the PMST Reports, several key species of the EAAF present in Australia are both migratory and present within the vicinity of the activities described within this EP. These species include the curlew

sandpiper, red knot, great knot, far eastern curlew, and black-tailed godwit (Hansen et al., 2016), which are listed in Table 4-4 and described in Section 4.6.2.

Table 4-4: Listed bird species identified in the Operational Area and EMBAs

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	LIGHT EMBA (20 KM)	FLARING EMBA (63 KM)	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Antipodean Albatross	*Diomedea antipodensis*	V	✓(M)	✓	FLO	FLO	FLO	FLO	FLO	National Recovery Plan for albatrosses and petrels 2022
Asian Dowitcher	*Limnodromus semipalmatus*	V	✓(W)	✓	-	-	-	MO	KO	Conservation Advice for *Limnodromus semipalmatus* (Asian dowitcher)
Australasian Bittern	*Botaurus poiciloptilus*	E	-	-	-	-	KO	KO	KO	Conservation Advice *Botaurus poiciloptilus* Australasian Bittern Commonwealth Listing Advice on *Botaurus poiciloptilus* (Australasian Bittern) National Recovery Plan for the Australasian Bittern (*Botaurus poiciloptilus)*
Australasian Gannet	*Morus serrator*	-	-	✓	-	-	-	BKO	BKO	-
Australian Fairy Tern	*Sternula nereis nereis*	V	-	-	FLO	FLO	KO	KO	KO	Approved Conservation Advice for *Sternula nereis nereis* (Fairy Tern) Commonwealth Listing Advice on *Sternula nereis nereis* (Fairy Tern) National Recovery Plan for the Australian Fairy Tern (*Sternula nereis nereis*)
Australian Painted Snipe	*Rostratula australis*	E	-	✓	-	-	LO	KO	KO	Approved Conservation Advice for *Rostratula australis* (Australian painted snipe) Commonwealth Listing Advice on *Rostratula australis* (Australian Painted Snipe) National Recovery Plan for the Australian Painted Snipe (*Rostratula australis*).
Bar-tailed Godwit	*Limosa lapponica*	-	✓(W)	✓	-	-	KO	KO	KO	-
Black-browed Albatross	*Thalassarche melanophris*	V	✓(M)	✓	FLO	FLO	FLO	FLO	FLO	Commonwealth Listing Advice on Black-browed Albatross (*Thalassarche melanopris*) National Recovery Plan for albatrosses and petrels 2022
Black-faced Cormorant	*Phalacrocorax fuscescens*	-	-	✓	-	-	-	BKO	BKO	-
Black-faced Monarch	*Monarcha melanopsis*	-	-	✓	-	-	KO	KO	KO	-
Black-tailed Godwit	*Limosa limosa*	E	✓(W)	✓	-	-	-	KO	RKO	-
Blue Petrel	*Halobaena caerulea*	V	-	✓	MO	MO	MO	MO	MO	Conservation Advice *Halobaena caerulea* blue petrel
Blue-winged Parrot	*Neophema chrysostoma*	V	-	✓	-	MO	KO	KO	KO	Conservation Advice for *Neophema chrysostoma* (blue-winged parrot)
Broad-billed Sandpiper	*Limicola falcinellus*	-	✓(W)	✓	-	-	-	-	RKO	-

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	LIGHT EMBA (20 KM)	FLARING EMBA (63 KM)	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Brown skua	*Stercorarius antarcticus*	-	-	✓	MO	MO	MO	MO	MO	-
Brown Treecreeper (south-eastern)	*Climacteris picumnus victoriae*	V	-	-	-	-	MO	KO	KO	Conservation Advice for *Climacteris picumnus victoriae* (brown treecreeper (south-eastern)
Buller's Albatross	*Thalassarche bulleri*	V	✓(M)	✓	MO	MO	MO	FLO	FLO	National Recovery Plan for albatrosses and petrels 2022
Campbell Albatross	*Thalassarche impavida*	V	✓(M)	✓	FLO	FLO	FLO	FLO	FLO	National Recovery Plan for albatrosses and petrels 2022
Caspian Tern	*Hydroprogne caspia*	-	✓(M)	✓	-	-	-	BKO	BKO	-
Cattle Egret	*Bubulcus ibis*	-	-	✓	-	-	MO	MO	MO	-
Chatham Albatross	*Thalassarche eremita*	E	✓(M)	✓	FMO	FMO	FMO	FMO	FMO	National Recovery Plan for albatrosses and petrels 2022
Common Diving-Petrel	*Pelecanoides urinatrix*	-	-	✓	-	-	-	BKO	BKO	-
Common Greenshank	*Tringa nebularia*	E	✓(W)	✓	-	-	LO	KO	KO	-
Common Noddy	*Anous stolidus*	-	✓(M)	✓	-	-	-	LO	LO	-
Common Sandpiper	*Actitis hypoleucos*	-	✓(W)	✓	MO	MO	KO	KO	KO	-
Curlew Sandpiper	*Calidris ferruginea*	CE	✓(W)	✓	MO	MO	KO	KO	KO	Conservation Advice *Calidris ferruginea* Curlew Sandpiper
Diamond Firetail	*Stagonopleura guttata*	V	-	-	-	-	KO	KO	KO	Conservation Advice for *Stagonopleura guttata* (diamond firetail)
Double-banded Plover	*Charadrius bicinctus*	-	✓(W)	✓	-	-	-	RKO	RKO	-
Eastern Bristlebird	*Dasyornis brachypterus*	E	-	-	-	-	LO	KO	KO	National Recovery Plan for Eastern Bristlebird (*Dasyornis brachypterus*).
Eastern Curlew	*Numenius madagascariensis*	CE	✓(W)	✓	MO	MO	KO	KO	KO	Conservation Advice *Numenius madagascariensis* Eastern Curlew
Eastern Hooded Plover	*Thinornis rubricollis*	V	-	✓	-	-	KO	KO	KO	Conservation Advice *Thinornis rubricollis rubricollis* Hooded Plover (Eastern)
Fairy prion (southern)	*Pachyptila turtur subantarctica*	V	-	-	MO	MO	KO	KO	KO	Conservation advice *Pachyptila turtur subantarctica* fairy prion (southern)
Fairy Prion	*Pachyptila turtur*	-	-	✓	MO	MO	KO	KO	KO	-
Fairy Tern	*Sternula nereis*	-		✓	-	-	BKO	BKO	BKO	-
Flesh-footed Shearwater	*Ardenna carneipes*	-	✓(M)	✓	LO	LO	FLO	FLO	FLO	-

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	LIGHT EMBA (20 KM)	FLARING EMBA (63 KM)	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Fork-tailed Swift	*Apus pacificus*	-	✓(M)	✓	-	-	LO	LO	LO	-
Forty-spotted Pardalote	*Pardalotus quadragintus*	E	-	-	-	-	-	LO	FKO	Conservation Advice *Pardalotus quadraginatus* forty-spotted pardalote National Recovery Plan for the Forty-spotted Pardalote (*Pardalotus quadragintus)*
Gang-gang Cockatoo	*Callocephalon fimbriatum*	E	-	-	-	-	KO	KO	KO	Conservation Advice for *Callocephalon fimbriatum* (Gang-gang Cockatoo)
Gibson's Albatross	*Diomedea antipodensis gibsoni*	V	-	✓	FLO	FLO	FLO	FLO	FLO	National Recovery Plan for albatrosses and petrels 2022
Gould's Petrel	*Pterodroma leucoptera leucoptera*	E	-	-	MO	MO	MO	BKO	BKO	Gould's Petrel (*Pterodroma leucoptera leucoptera*) Recovery Plan
Great Frigatebird	*Fregata minor*	-	✓(M)	✓	-	-	-	MO	MO	-
Great Knot	*Calidris tenuirostris*	V	✓(W)	✓	-	-	-	RKO	RKO	Conservation advice *Calidris tenuirostriss* Great knot
Great Skua	*Stercorarius skua*	-	-	✓	MO	-	MO	-	-	-
Great-winged Petrel	*Great-winged Petrel*	-	-	✓		-		-	-	-
Greater Crested Tern	*Thalasseus bergii*	-	✓(W)	✓	-	-	-	BKO	BKO	-
Greater Sand Plover	*Charadrius leschenaultii*	V	✓(W)	✓	-	-	KO	KO	KO	Conservation Advice *Charadrius leschenaultii* Greater sand plover
Grey Falcon	*Falco hypoleucos*	V	-	-	-	-	LO	LO	LO	Conservation Advice *Falco hypoleucos* Grey Falcon
Grey Plover	*Pluvialis squatarola*	V	✓(W)	✓	-	-	-	KO	RKO	-
Grey-headed Albatross	*Thalassarche chrysostoma*	E	✓(M)	✓	MO	MO	MO	MO	MO	Approved Conservation Advice for *Thalassarche chrysostoma* (Grey-headed Albatross) National Recovery Plan for albatrosses and petrels 2022
Grey-tailed Tattler	*Tringa brevipes*	-	✓(W)	✓	-	-	-	KO	RKO	-
Herald Petrel	*Pterodroma heraldica*	CE	-	-	-	-	-	LO	LO	Conservation Advice *Pterodroma heraldica* Herald petrel Commonwealth Listing Advice on *Petrodroma heraldica* (Herald Petrel)
Hooded Plover	*Thinornis cucullatus*	-	-	✓	-	-	KO	KO	KO	-
Indian Yellow-nosed Albatross	*Thalassarche carteri*	V	✓(M)	✓	LO	LO	LO	LO	LO	National Recovery Plan for albatrosses and petrels 2022
Kelp Gull	*Larus dominicanus*	-	-	✓	-	-	-	-	BKO	-

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	LIGHT EMBA (20 KM)	FLARING EMBA (63 KM)	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Kermadec Petrel (western)	*Pterodroma neglecta neglecta*	V	-	-	-	-	-	FMO	FMO	Lord Howe Island Biodiversity Management Plan Norfolk Island Region Threatened Species Recovery Plan
Latham's Snipe	*Gallinago hardwickii*	V	✓(W)	✓	-	-	KO	KO	KO	-
Lesser Frigatebird	*Fregata ariel*	-	✓(M)	✓	-	-	-	LO	KO	-
Lesser Sand Plover	*Charadrius mongolus*	E	✓(W)	✓	-	-	-	KO	RKO	Conservation Advice *Charadrius mongolus* Lesser sand plover
Little Curlew	*Numenius minutus*	-	✓(W)	✓	-	-	FLO	RLO	RKO	-
Little Penguin	*Eudyptula minor*	-	-	✓	-	-	-	BKO	BKO	-
Little Tern	*Sternula albifrons*	V	✓(M)	✓	-	-	BKO	BKO	BKO	-
Long-toed Stint	*Calidris subminuta*	-	✓(W)	✓	-	-	-	-	RKO	-
Marsh Sandpiper	*Tringa stagnatilis*	-	✓(W)	✓	-	-	-	KO	RKO	-
Masked Owl (Tasmania)	*Tyto novaehollandiae castanops (Tasmanian population)*	V	-	-	-	-	-	KO	KO	Approved Conservation Advice for Tyto *novaehollandiae castanops* (Tasmanian Masked Owl) Commonwealth Listing Advice on Tyto *novaehollandiae castanops* (Masked Owl (Tasmanian))
Norther Buller's Albatross	*Thalassarche bulleri platei*	V	-	✓	MO	MO	MO	FLO	FLO	National Recovery Plan for albatrosses and petrel 2022.
Northern Giant Petrel	*Macronectes halli*	V	✓(M)	✓	FLO	FLO	FLO	FLO	FLO	Commonwealth Listing Advice on *Macronectes halli* National Recovery Plan for albatrosses and petrels 2022
Northern Royal Albatross	*Diomedea sanfordi*	E	✓(M)	✓	FLO	FLO	FLO	FLO	FLO	National Recovery Plan for albatrosses and petrels 2022
Nunivak Bar-tailed Godwit	*Limosa lapponica baueri*	E	-	-	-	-	KO	KO	KO	Conservation Advice *Limosa lapponica baueri* Bar-tailed godwit (western Alaskan)
Orange-bellied Parrot	*Neophema chrysogaster*	CE	-	✓	-	-	MO	MO	KO	Commonwealth Listing Advice on *Neophema chrysogaster* National Recovery Plan for the Orange-bellied Parrot, *Neophema chrysogaster*
Oriental Cuckoo	*Cuculus optatus*	-	✓(T)	-	-	-	-	KO	KO	-
Oriental Plover	*Charadrius veredus*	-	✓(W)	✓	-	-	-	-	RKO	-
Osprey	*Pandion haliaetus*	-	✓(W)	✓	-	MO	KO	KO	KO	-
Pacific Golden Plover	*Pluvialis fulva*	-	✓(W)	✓	-	-	-	KO	RKO	-
Pacific Gull	*Larus pacificus*	-	-	✓	-	-	-	BKO	BKO	-

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	LIGHT EMBA (20 KM)	FLARING EMBA (63 KM)	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Painted Honeyeater	*Grantiella picta*	V	-	-	-	-	KO	KO	KO	
Pectoral Sandpiper	*Calidris melanotos*	-	✓(W)	✓	MO	MO	MO	LO	KO	-
Pied Stilt	*Himantopus himantopus*	-	-	✓	-	-	KO	FKO	RKO	-
Pilotbird	*Pycnoptilus floccosus*	V	✓(W)	-	-	-	KO	KO	KO	Conservation Advice for *Pycnoptilus floccosus* (Pilotbird)
Pin-tailed Snipe	*Gallinago stenura*	-	✓(W)	✓	-	-	FLO	RLO	RLO	-
Rainbow Bee-eater	*Merops ornatus*	-	-	✓	-	-	MO	MO	MO	-
Red Goshawk	*Erythrotriorchis radiatus*	E	-	-	-	-	-	-	MO	Conservation Advice for *Erythrotriorchis radiatus* (red goshawk) National recovery plan for the red goshawk *Erythrotriorchis radiatus*
Red Knot	*Calidris canutus*	V	✓(W)	✓	MO	MO	KO	KO	KO	Conservation Advice *Calidris canutus* Red Knot
Red-capped Plover	*Charadrius ruficapillus*	-	-	✓	-	-	KO	RKO	RKO	-
Red-necked Avocet	*Recurvirostra novaehollandiae*	-	-	✓	-	-	-	KO	RKO	-
Red-necked Stint	*Calidris ruficollis*	-	✓(W)	✓	-	-	-	RKO	RKO	-
Red-tailed Tropicbird	*Phaethon rubricauda*	-		✓	-	-	-	KO		-
Regent Honeyeater	*Anthochaera phrygia*	CE	-	-	-	-	KO	KO	KO	Conservation Advice *Anthochaera phrygia* regent honeyeater
Ruddy Turnstone	*Arenaria interpres*	V	✓(W)	✓	-	-	-	RKO	RKO	-
Ruff (Reeve)	*Philomachus pugnax*	-	✓(W)	✓	-	-	-	KO	RKO	-
Rufous Fantail	*Rhipidura rufifrons*	-		✓	-	-	KO	KO	KO	-
Salvin's Albatross	*Thalassarche salvini*	V	✓(M)	✓	FLO	FLO	FLO	FLO	FLO	National Recovery Plan for albatrosses and petrels 2022
Sanderling	*Calidris alba*	-	✓(W)	✓	-	-	-	RKO	RKO	-
Satin Flycatcher	*Myiagra cyanoleuca*	-		✓	-	-	KO	KO	BKO	-
Sharp-tailed Sandpiper	*Calidris acuminata*	V	✓(W)	✓	MO	MO	KO	RKO	RKO	Conservation Advice for *Calidris acuminata* (sharp-tailed sandpiper)
Short-tailed Shearwater	*Ardenna tenuirostris*	-	✓(M)	✓	-	-	-	BKO	BKO	-
Shy Albatross	*Thalassarche cauta*	E	✓(M)	✓	FLO	FLO	FLO	FLO	FLO	Conservation Advice *Thalassarche cauta* Shy Albatross National Recovery Plan for albatrosses and petrels 2022

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	LIGHT EMBA (20 KM)	FLARING EMBA (63 KM)	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Silver Gull	*Chroicocephalus novaehollandiae*	-	-	✓	-	-	-	BKO	BKO	-
Soft-plumaged Petrel	*Pterodroma mollis*	V	-	✓	-	-	-	MO	MO	Conservation Advice *Pterodroma Mollis* soft-plumaged petrel
Sooty Albatross	*Phoebetria fusca*	V	✓(M)	✓	MO	MO	MO	LO	LO	National Recovery Plan for albatrosses and petrels 2022
Sooty Shearwater	*Ardenna grisea*	V	✓(M)	✓	MO	MO	LO	BKO	BKO	-
Sooty Tern	*Onychoprion fuscatus*	-	-	✓	-	-	KO	BKO	BKO	-
South-eastern Glossy Black-Cockatoo	*Calyptorhynchus lathami lathami*	V	-	-	-	-	KO	KO	KO	Conservation Advice for *Calyptorhynchus lathami* lathami (South-eastern Glossy Black Cockatoo)
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	E	-	-	-	-	KO	LO	LO	Conservation Advice for Melanodryas cucullata cucullata (hooded robin (south-eastern)).
Southern Giant Petrel	*Macronectes giganteus*	E	✓(M)	✓	MO	MO	MO	FLO	FLO	Commonwealth Listing Advice on *Macronectes giganteus* National Recovery Plan for albatrosses and petrels 2022
Southern Royal Albatross	*Diomedea epomophora*	V	✓(M)	✓	FLO	FLO	FLO	FLO	FLO	National Recovery Plan for albatrosses and petrels 2022
Southern Whiteface	*Aphelocephala leucopsis*	V	-	-	-	-	KO	MO	MO	Conservation Advice for Aphelocephala leucopsis (southern whiteface).
Spectacled Monarch	*Symposiachrus trivirgatus*	-	✓(T)	✓	-	-	-	KO	KO	-
Streaked Shearwater	*Calonectris leucomelas*	-	✓(M)	✓	-	-	-	LO	KO	-
Swift Parrot	*Lathamus discolor*	CE	-	✓	-	-	KO	KO	BKO	Conservation Advice *Lathamus discolor* swift parrot National Recovery Plan for the Swift Parrot (Lathamus discolor)
Swinhoe's Snipe	*Gallinago megala*	-	✓(W)	✓	-	-	FLO	RLO	RLO	-
Tasmanian Azure Kingfisher	*Ceyx azureus diemenensis*	E	-	-	-	-	-	MO	KO	Approved Conservation Advice for *Ceyx azureus diemenensis* (Tasmanian Azure Kingfisher) Commonwealth Listing Advice on *Ceyx azureus diemenensis* (Tasmanian Azure Kingfisher)
Tasmanian Wedge-tailed Eagle (Tasmanian)	*Aquila audax fleayi*	E	-	-	-	-	-	BLO	BLO	Threatened Tasmanian Eagles Recovery Plan 2006-2010
Terek Sandpiper	*Xenus cinereus*	V	✓(W)	✓	-	-	-	KO	RKO	Conservation Advice for *Xenus cinereus* (terek sandpiper) Wildlife Conservation Plan for Migratory Shorebirds
Wandering Albatross	*Diomedea exulans*	V	✓(M)	✓	FLO	FLO	FLO	FLO	FLO	National Recovery Plan for albatrosses and petrels 2022

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	LIGHT EMBA (20 KM)	FLARING EMBA (63 KM)	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Wandering Tattler	*Tringa incana*	-	✓(W)	✓	-	-	-	-	RKO	-
Wedge-tailed Shearwater	*Ardenna pacifica*	-	✓(M)	✓	-	-	-	BKO	BKO	-
Whimbrel	*Numenius phaeopus*	-	✓(W)	✓	-	-	-	RKO	RKO	-
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	-	-	✓	-	-	BKO	BKO	BKO	-
White-bellied Storm Petrel	*Fregetta grallaria grallaria*	V	-	-	LO	LO	LO	LO	LO	Lord Howe Island Biodiversity Management Plan
White-capped Albatross	*Thalassarche steadi*	V	✓(M)	✓	FKO	FKO	FKO	FKO	FKO	National Recovery Plan for albatrosses and petrels 2022
White-face Storm Petrel	*Pelagodroma marina*	-	-	✓	-	-	-	BKO	BKO	-
White-fronted Tern	*Sterna striata*	-	-	✓	MO	FLO	FLO	BKO	BKO	-
White-necked Petrel	*Pterodroma cervicalis*	-	-	✓	MO	MO	MO	BLO	BLO	-
White-tailed Tropicbird	*Phaethon lepturus*	-	✓(M)	✓	-	-	-	MO	KO	-
White-throated Needletail	*Hirundapus caudacutus*	V	✓(T)	✓	-	-	RKO	KO	KO	Conservation Advice *Hirundapus caudacutus* White-throated Needletail
Wood Sandpiper	*Tringa glareola*	-	✓(W)	✓	-	-	-	KO	RKO	-
Yellow Wagtail	*Motacilla flava*	-	✓(T)	✓	-	-	-	MO	KO	-

Threatened Species:

V – Vulnerable

E – Endangered

CE – Critically Endangered

CD – Conservation Dependent

Type of presence:

MO - Species or species habitat that may occur within the area

LO - Species or species habitat likely to occur within area

KO - Species or species habitat known to occur within area

FMO – Foraging may occur

FLO – Foraging likely to occur

FKO - Foraging known to occur

BKO – Breeding known to occur

RLO – Roosting likely to occur

RKO – Roosting known to occur

Migratory:

(M) – Migratory

(W) – Wetland

(T) – Terrestrial

4.6.2.1. Seabirds

Albatross and Petrels

A total of 16 Albatross and 13 Petrel species were identified to occur within the EMBA by the PMST. There are eight different species of Albatross that have been identified to have BIAs associated with the EMBA, all of which are foraging (shown in Figure 4-22 and Figure 4-23). Of these eight species, six of them have also been identified to utilise the Operational Area for foraging; Black-browed Albatross, Buller's Albatross, Campbell Albatross, Indian Yellow-nose Albatross, Shy Albatross and the Wandering Albatross.

Albatross species demonstrate a diverse range of diets and foraging behaviours; combined with their ability to cover vast oceanic distances. Consequently, all marine areas within Australia are considered foraging habitat for this species (CoA, 2022). The most critical foraging zones are located south of 25°S, where the majority of albatross species concentrate their foraging activity (CoA, 2022). Albatross' typically feed offshore, along the edge of the continental shelf and over open waters, where they catch fish and cephalopods by diving into the water (CoA, 2022).

The Black-browed Albatross (*Thalassarche melanophris*) is a key species for conservation in the South-east Marine Region. It exhibits a circumpolar distribution, ranging across Antarctic, subantarctic, and subtropical seas (CoA 2022). Their annual breeding season begins in September, with the fledging of young between April and May at breeding sites on Macquarie Island, Bishop, Clerk Islets, and a more distant Heard and McDonald Islands (Australian external territory) (Figure 4-22). Outside of breeding, these albatrosses are frequently observed foraging along the southern Australian coastline, from Perth to Sydney (Reid et al. 2002). Immature birds, likely from Indian Ocean and South Georgian colonies, are common in south-eastern Australian waters between October and January (Reid et al. 2002), while sub-adults are present year-round. The entire South-east Marine Region is identified as a foraging area BIA for this species, overlapping with the Operational Area and EMBAs.

Buller's Albatross (*Thalassarche bulleri)* is recognised as a conservation priority species within the South-east Marine Region (CoA, 2022). The species is endemic to New Zealand, where it breeds exclusively on offshore islands. The Buller's Albatross has a foraging range extending across the South Pacific Ocean. Typically, adult birds forage between 40–50°S, from the waters east of Tasmania to the Chatham Rise (NZ), whereas juvenile and non-breeding adults undertake broader dispersal throughout the South Pacific, reaching the South American coast (BirdLife International, 2004). The species is most commonly found in the vicinity of Tasmania between January and July (CoA, 2022). Satellite tracking data from New Zealand breeding sites (Stahl and Sagar, 2006) reveal that while breeding adults predominantly forage in New Zealand waters, both breeding and non-breeding segments of the population also utilise foraging grounds around Tasmania. Consequently, a foraging BIA for the Buller's Albatross exists within the South-east Marine Region, coinciding with the Operational Area and EMBAs (Figure 4-22).

The Campbell Albatross (*Thalassarche impavida)*, a subspecies of the Black-browed Albatross, is listed as a conservation priority within the South-east Marine Region (CoA, 2022). This species is endemic to Campbell Island, located in the New Zealand subantarctic, where it breeds exclusively. It breeds annually from early August to May (ACAP, 2023). Juveniles migrate north and disperse through subtropical waters in winter, including along Australia's eastern coast (ACAP, 2023). During winter, adults are widely distributed across the Tasman Sea and the southwestern Pacific east of New Zealand, while in summer their distribution (including non-breeding birds) is more southerly and restricted (32°S to 44°S) (Waugh et al. 1999). Their diet consists of krill, fish, and some cephalopods, salps, and jellyfish. The entire South-east Marine Region is recognized as a foraging Biodiversity Important Area (BIA) for this species, overlapping the Operational Area and EMBAs (Figure 4-22).

The Indian Yellow-nose Albatross is a designated a conservation priority in the South-east Marine Region (CoA, 2022). The Indian yellow-nosed albatross (*Thalassarche carteri*) has breeding sites on the French subantarctic islands and South Africa's Prince Edward Islands (ACAP, 2023). Away from these breeding locations, the species disperses across a broad non-breeding range, frequently occurring off the coasts of southern Africa and Australia (ACAP, 2023). Recent satellite tracking data indicates that during the winter, the Indian yellow-nosed albatross is present throughout the South-east Marine Region, reaching as far south as 45ºS (Delord and Weimerskirch 2011). The foraging BIA for this species within the South-east Marine Region and overlaps the Operational Area and EMBAs (Figure 4-23)

The Shy Albatross (*Thalassarche cauta*) is an endemic Australian albatross species, breeding on Albatross Island in the Bass Strait, and the Mewstone and Pedra Branca off southern Tasmania within the Tasmanian Wilderness World Heritage Area (Alderman et al. 2010) (Figure 4-23). Their annual breeding cycle involves egg-laying in September and chick fledging in April. In terms of foraging, shy albatrosses differ from many other albatross species by being less pelagic; they are commonly observed over the continental shelf and regularly approach the shorelines of Tasmania and southern Australia (CoA, 2022). The breeding grounds are critical habitats, with a foraging BIA established around Albatross Island. The entire South-east Marine Region is recognized as a likely foraging BIA for this endemic species, overlapping the Operational Area and EMBAs.

The Wandering Albatross (*Diomedea exulans*) breeds across six sub-Antarctic Island groups (ACAP, 2023) on a biennial cycle, laying eggs in December and fledging chicks between mid-November and late February. Although a small Australian breeding population is found on Macquarie Island (outside the EMBA) (ACAP, 2023), tracking reveals spatial segregation in foraging. Macquarie Island females forage north towards southern Tasmania, while males venture into the open Southern Ocean south of 50°S. Juvenile distribution is concentrated north and east of Macquarie Island in Pacific waters, off south-eastern Australia and around New Zealand. Their diet in the Southern Ocean consists mainly of squid and fish (Nicholls et al. 1997), supplemented by crustaceans and carrion, with remarkable foraging trips exceeding 15,200 km. Southern Australia serves as an important wintering ground for non-breeding and juvenile birds originating from Atlantic and Indian Ocean breeding colonies. During the non-breeding season, females tend to forage at more northerly latitudes than males (Baker and Hamilton 2013). The South-east Marine Region north of 50°S is designated as a foraging BIA for this species, overlapping the Operational Area and EMBAs (Figure 4-23).

There are eight different species of petrels that have been identified to have BIAs associated with the EMBA, including foraging, breeding and migration (shown in Figure 4-24 and Figure 4-25). Of these eight species, the Common Diving-Petrel (*Pelecanoides urinatrix*) has been identified to utilise the Operational Area for a foraging BIA.

The Common Diving-Petrel breeds on offshore islands in south-eastern Australia and Tasmania, with notable population concentrations. In Tasmania, 30 breeding colonies have been recorded, each supporting over 1,000 breeding pairs, while Victoria hosts 12 such colonies. Key breeding sites include Seal Island, Wilsons Promontory, and Lady Julia Percy Island (DoE, 2022). A foraging BIA has been identified for this species that overlaps with both the Operational Area and EMBAs (Figure 4-24).

Similar to Albatrosses, Petrels have a diverse foraging range, with all marine waters within Australian jurisdiction considered foraging habitat for this species. Typical diet for petrels includes cephalopods and fish which is predominately caught by surface-seizing (CoA, 2022). Foraging activity by the Common Diving-Petrel is known to occur within the region, with its range extending throughout Bass Strait and encircling Tasmania. These waters are considered high-use foraging habitat, reflecting the species' reliance on coastal and shelf-associated marine environments.

Many threatened Petrel species breed in Australia's jurisdiction with a high concentration occurring on the offshore islands of Tasmania (Albatross Island, Macquarie Island, the Mewstone and Pedra Branca), the external Territory of Heard Island and McDonald Islands, and the Australian Antarctic Territory (AAT) (CoA 2022). Petrels are extremely site-faithful, meaning that individuals are unlikely to change breeding locations with each breeding season (CoA 2022). Species with breeding BIAs that occur within the EMBAs include the White-faced Strom Petrel and the Common Diving-Petrel.

Additionally, the Herald Petrel is an EPBC Act listed Critically Endangered species under the EPBC Act and may occur within the EMBA. This species forages primarily on cephalopods in waters of the surrounding islands south of the equator and may be found off the east coast of Australia (DoE 2023). Within Australia the only breeding known to occur is located on Taine Island, Queensland (outside the EMBA) where bird's nest on the ground under vegetation.



Figure 4-22: Albatross species Biologically Important Areas within the EMBA



Figure 4-23: Albatross species Biologically Important Areas within the EMBA

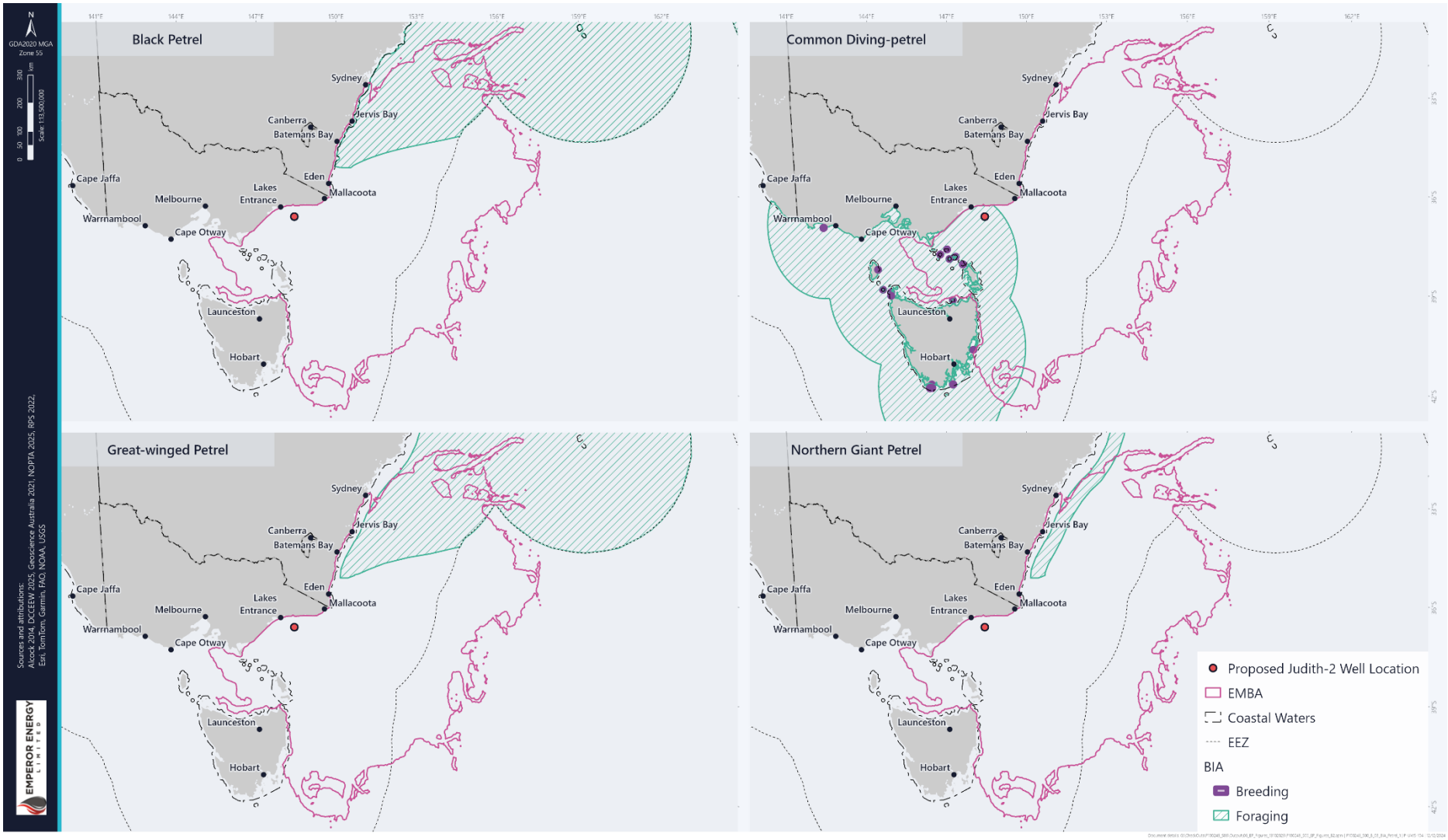


Figure 4-24: Petrel species Biologically Important Areas within the EMBA



Figure 4-25: Petrel species Biologically Important Areas within the EMBA

Shearwaters

Five Shearwater species have been identified within the EMBAs, with the Flesh-footed Shearwater identified as potentially occurring within the Operational Area (CoA, 2020c). Of these five species, four have BIAs associated with the EMBA, encompassing both foraging and breeding behaviours. (Figure 4-26) and are discussed in detail below. None of these four species have been identified to have a BIA within the Operational Area.

Shearwaters represent the most abundant seabird in Australia. These species are predominantly a pelagic species, outside of breeding seasons, during which they occupy remote islands or coastal headlands. In south-eastern Australia, shearwater breeding typically occurs during the summer months. Nesting sites are commonly located in burrows or rock crevices (CoA, 2020c). Species with breeding BIAs that occur within the EMBAs include the Short-tailed Shearwater, Wedge-tailed Shearwater and the Sooty Shearwater.

Shearwaters are known to forage for a variety of pelagic prey, including krill, cephalopods, fish and crustaceans. Food is usually taken by pursuit-plunging, surface plunging or surface-seizing; however other methods (e.g. hydroplaning, deep plunging) have been observed. All Shearwater species that have recognised BIAs within the EMBA exhibit foraging behaviours. The Short-tailed Shearwater is one of few native birds that is commercially harvested on the offshore islands of Tasmania (Tasmania Parks & Wildlife Service 2014).

The Flesh-footed Shearwater (*Ardenna carneipes*) is a trans-equatorial migrant that has been identified to potentially forage within the EMBA. During its breeding season (early September to early May), it is widely distributed across the southwestern Pacific and commonly observed over the continental shelf and slope, occasionally entering inshore waters (CoA, 2020c). This species breeds in burrows located on sloping coastal habitats (forest, scrubland, shrubland, or grassland), with the main breeding areas situated off the coast of southern Western Australia, with smaller populations on Smith Island (SA) and Lord Howe Island (NSW) (CoA, 2020c). Its diet comprises small fish, a variety of cephalopods (squid, cuttlefish, nautilus, argonauts), crustaceans (barnacles, shrimp), other soft invertebrates like Velella, and offal. Foraging occurs almost exclusively at sea using techniques like surface plunging, pursuit plunging, surface seizing, surface diving, pursuit diving, and pattering (CoA, 2020c). The BIA for this species overlaps with the EMBA.

The Short-tailed Shearwater (*Ardenna tenuirostris*), also known as the muttonbird, is a conservation priority in the South-east Marine Region (CoA, 2020c). This migratory species is present in Australian waters from September to May, breeding on numerous islands off Victoria and Tasmania, ~190 km southwest of the Operational Area and ~170 km south of the Operational Area, respectively. The closest breeding BIAs is at the Furneaux Island Group, ~107 km south of the Flaring Light EMBA. Breeding and foraging BIAs (September to May) overlap the EMBA (Figure 4-26). During breeding, they employ a bimodal foraging strategy: short local trips for chick provisioning and longer (up to 17 days) trips to the Polar Frontal Zone. Their diet includes fish (mainly myctophids), crustaceans, and squid. They often feed in large flocks of up to 20,000 individuals.

The Sooty Shearwater (*Ardenna grisea*) is listed as vulnerable and is a conservation concern in the South-east Marine Region (CoA, 2020c). This species breeds in large colonies on islands and headlands, constructing burrows under tussock grass and low scrub. Typically, birds do not return to their breeding sites until about four years of age. Their diet is diverse, including fish, crustaceans, and cephalopods, which they capture by diving. Parents undertake both short (1–3 day) and long (5–15 day) foraging trips to provide for their young. Foraging BIAs are located off the coasts of New South Wales and south Tasmania, ~170 km northeast and ~430 km south of the Operational Area, respectively. The Australian breeding population is estimated to be around 6,500 pairs (CoA, 2020c), and their breeding sites within Australian territory are located on offshore islands off the coasts of New South Wales and south Tasmania.

The Streaked Shearwater (*Calonectris leucomelas*) is a migratory seabird that enters Australian waters, particularly during its non-breeding season. This species breeds in colonies on islands off the coasts of Japan, Korea, China, and Russia. Outside the breeding season, Streaked Shearwaters migrate extensively southward and are commonly observed in waters off eastern and south-eastern Australia, including the South-east Marine Region (CoA, 2020c). They forage primarily on fish, squid, and crustaceans, which they catch by surface feeding and diving. The Streaked Shearwater has a foraging and breeding BIA overlapping the EMBA (Figure 4-26).

The Wedge-tailed Shearwater (*Ardenna pacifica*) has a breeding and foraging BIA that overlaps the EMBA (Figure 4-26). Although their movement patterns are not yet fully understood, populations at the northern and southern boundaries of their range are known to be migratory. Beaver (2022) identified Montague Island, NSW, as the southernmost known breeding site for Wedge-tailed Shearwaters, located ~254 km from the Operational Area, ~234 km from the light EMBA, and ~194 km from the flaring EMBA. However, 2017 observations recorded breeding further south at Gabo Island Lighthouse Reserve, Victoria, near the NSW border, ~134 km from the Operational Area, ~115 km from the light EMBA, and ~74 km from the flaring EMBA. These individuals typically leave their nesting sites between early April and early May, spending the non-breeding season in tropical waters (CoA, 2020c).

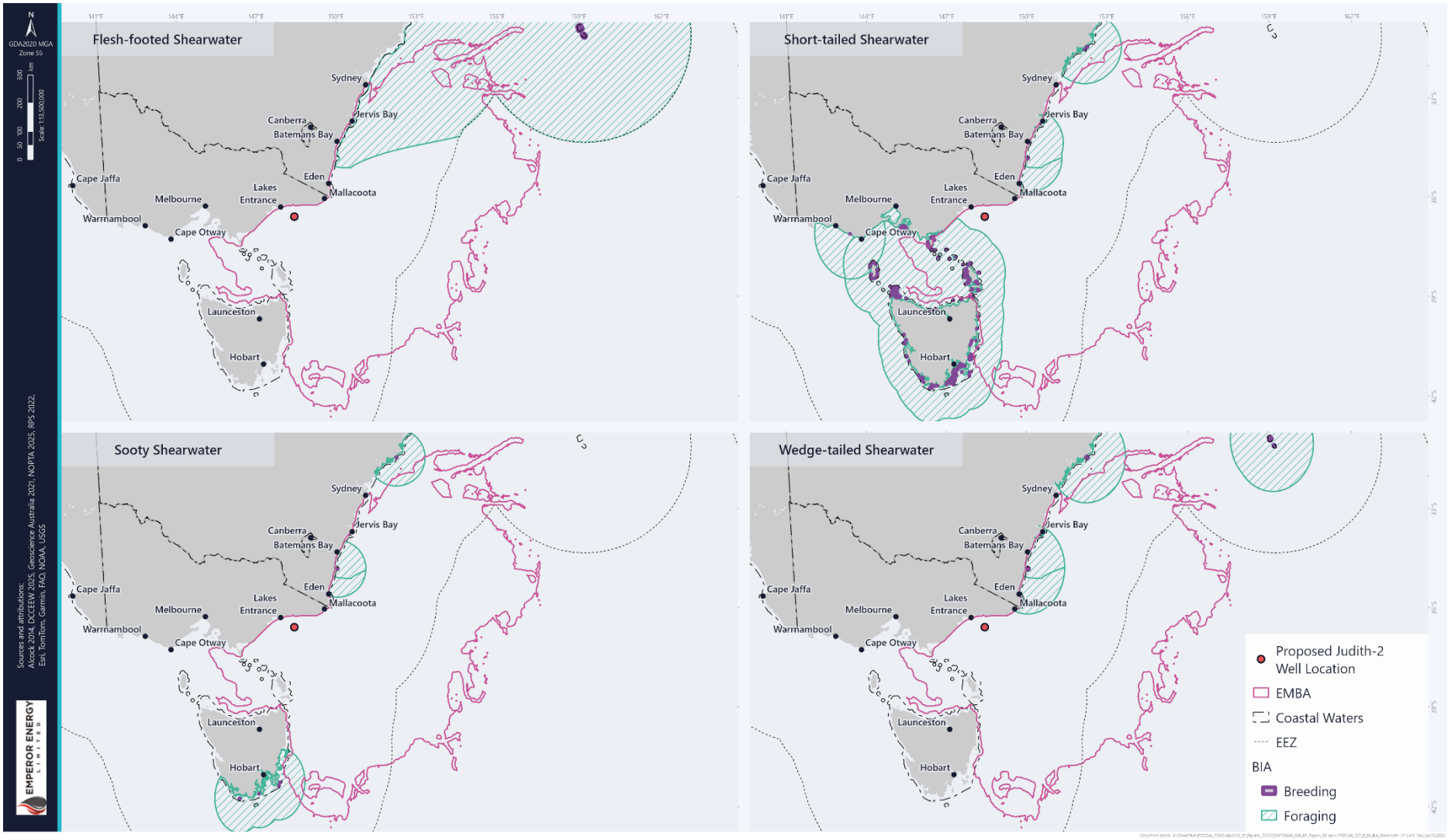


Figure 4-26: Shearwater species Biologically Important Areas within the EMBA

Other Seabirds

The black-faced cormorant, and white-fronted tern have breeding and foraging BIAs identified within the EMBA at the Furneaux Island Group (~200 km southwest of the Operational Area), and the crested tern has a breeding and foraging BIA ~256 km northeast of the Operational Area at Montague Island, NSW as displayed in Figure 4-27. None of these species have BIAs that intersect the Operational Area or Light EMBAs.

All species are common in southern Australia and can typically be found along the coast of Tasmania and Victoria. The White-fronted Tern (*Sterna striata*) breeds exclusively between October and February each year while the Crested Tern (*Thalasseus bergii)* and the Black-faced Cormorant (*Phalacrocorax fuscescens*) have varied breeding seasons (CoA 2020c). All three of these species breed exclusively along the coastline of rocky islands, or on stacks, slopes, or cliffs in large colonies. Species with breeding BIAs that occur within the EMBA include the White-fronted Tern and the Black-faced Cormorant. The Black-faced cormorant is primarily active during the day and are not anticipated to be impacted by artificial light (CoA 2020c). However, tern species may be susceptible to impacts from artificial light, which may impact foraging and nesting behaviours, as well as disorientation during migration (CoA 2020c). Bright lights can disorientate adult terns during colony establishment or when returning to nest at night. This can lead to nest abandonment, which leaves checks and eggs vulnerable to predators and environmental elements (DCCEEW 2023b).

All species forage within the marine environment. The Black-faced Cormorant forages for fish, primarily in coastal waters, sheltered bays and islets. While the White-fronted tern and the Crested tern venture out to the open sea to feed (CoA 2020c). Feeding behaviours between the species vary from shallow and surface plunging to plunge-diving. All three species have foraging BIAs that occur within the EMBA.

4.6.2.1. Shorebirds

Shorebirds, or waders, are species that frequent the shores or coastal or inland waters typically in search of food during low tide. Many shorebird species are migratory and move between their non-breeding grounds in the southern hemisphere to their northern hemisphere breeding grounds each year. There are no shorebird species known to exhibit biologically important behaviours within the EMBA; however, some species are EPBC Act Listed Critically Endangered.

The Curlew Sandpiper (*Calidris ferruginea)*, Eastern Curlew (*Numenius madagascariensis*) and the Great Knot (*Calidris tenuirostris*) are all EPBC Act listed Critically Endangered, migratory species which may be found within the EMBA. Each species breeds exclusively in the northern hemisphere and migrate to Australia for the non-breeding season. In Australia these species can be found in each state, typically along the coastline, however the Curlew Sandpipers may be widespread inland (DoE, 2023). These species typically forage during the non-breeding season on their migration towards Australia and once they have arrived. Foraging generally occurs within intertidal mudflats and sandflats, foraging on benthic invertebrates. Foraging may occur over the sea or within wetlands adjacent to the coast. Arrival in Australia occurs as early as July (Eastern Curlew) and as late as September (Curlew Sandpiper and Great Knot) (DoE, 2023).



Figure 4-27: Tern and Cormorant Biologically Important Areas within the EMBA

4.6.2.2. Other Birds

Other species of birds protected under the EPBC Act, but not categorised as shorebirds or seabirds, may also be present within the EMBA. This may include wetland species or terrestrial migratory species who rely on nearshore environments.

The Regent Honeyeater (*Anthochaera Phrygia*) and Swift Parrot (*Lathamus discolor)* are both EPBC Act listed Critically Endangered species which may be found within the EMBA. Both terrestrial species inhabit ironbark woodland forest within south-eastern Australia. The Regent Honeyeater is endemic and resident in mainland Australia with no known overseas migrations. Inland movements appear to be governed by the flowering of select eucalypt species (DoE, 2023). The Swift Parrot breeds exclusively in Tasmania during the summer months before migrating north to mainland Australia for winter (DoE, 2023). Coastal regions on mainland Australia typically support the largest number of individuals in NSW, when inland habitats are experiencing drought.

Little Penguin

The Little Penguin (*Eudyptula minor*) is an EPBC Act listed marine species which has been identified to have BIAs associated with the EMBA which include foraging and breeding (Figure 4-28). Neither BIA has been identified to occur within the Operational Area or underwater noise EMBAs.

The Little Penguin is a flightless seabird endemic to Australia and New Zealand. In Australia, the species can be found along the coast and adjacent islands from WA to NSW, including Tasmania. The species has become a particularly popular to tourism attraction across Australia. Visitors can visit the species on Penguin Island, WA, Low Head, Tasmania or watch the 'Penguin Parade' on Phillip Island. Little Penguins are nocturnal and will return to land, from sea, after dusk and leave before dawn the following morning (CoA, 2020c). The species typically breeds between autumn and summer months; however, the breeding season tends to vary year to year and between colonies. The Little Penguin creates its nest by burrowing underground (CoA, 2020c). Once eggs are laid, both male and females will take turns incubating.

The Little Penguin is considered a generalist feeder who forages utilising pursuit-diving methods typically close to the coastline and subsequent breeding colonies. When feeding chicks their diet seems to consist largely of clupeids, however they may also feed on krill or cephalopods during the breeding season (CoA 2020c).

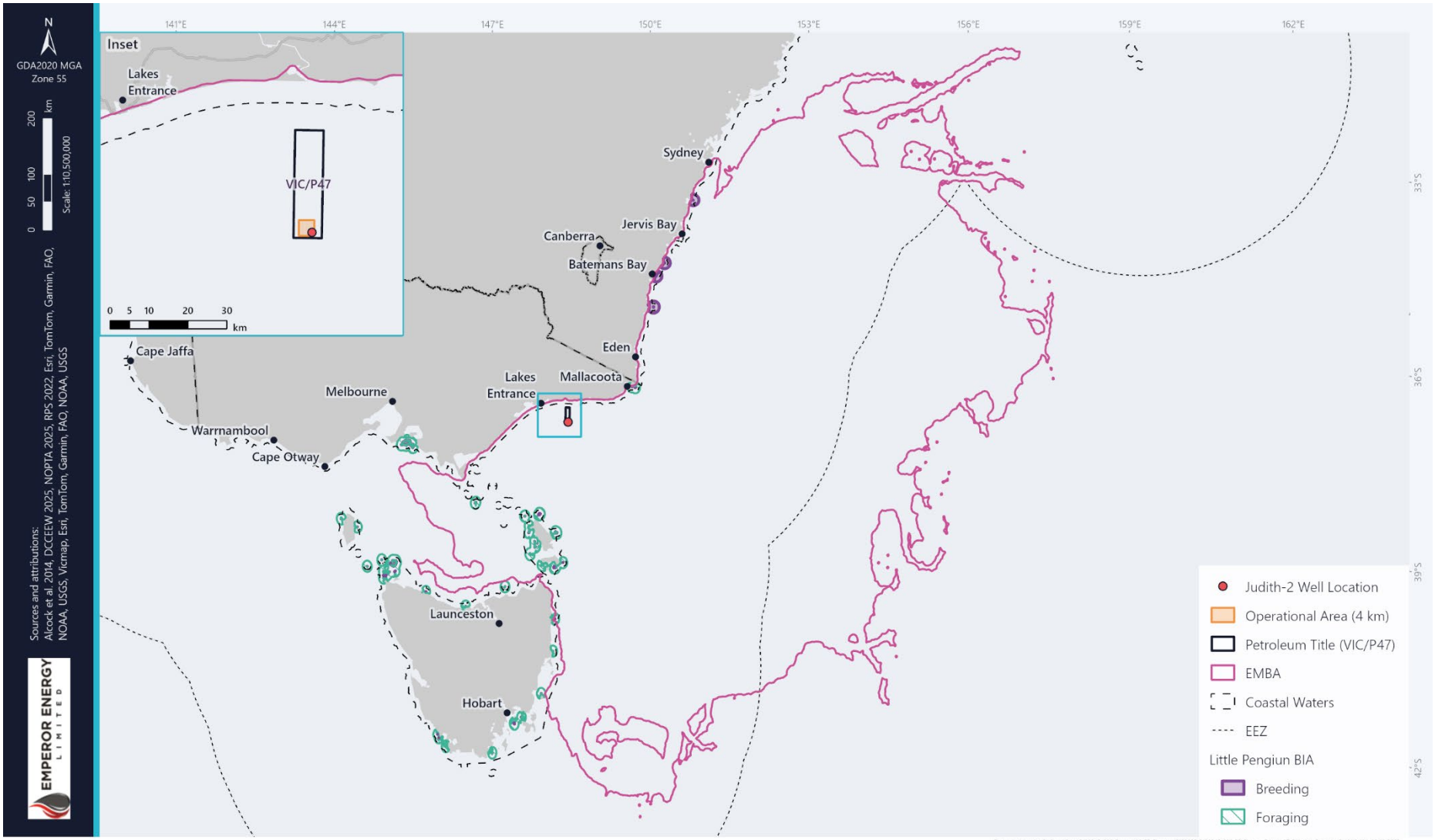


Figure 4-28: Little Penguin Biologically Important Areas within the EMBA

Orange-bellied Parrot

The Orange-bellied Parrot (*Neophema chrysogaster*) (OBP) is an EPBC Act listed Critically Endangered species which may be found within the EMBA. There are no identified BIAs for the Orange-bellied Parrot, however due to the state of the population species distribution and migration routes are strongly considered during the development of offshore activities. The EMBA overlaps probable migration routes over the Bass Strait and potential species distribution along the Victorian and NSW coastline (Figure 4-29).

The OBP is a ground feeding parrot endemic to south-eastern Australia which migrates across the Bass Strait between breeding and non-breeding ranges annually. The only known breeding range for this species occurs on the southwest of Tasmania, within 10 km of the Melaleuca Lagoon, located within the Tasmanian Wilderness World Heritage Area, which occurs approximately 616 km southwest of the Operational Area, outside of the light EMBAs (DELWP, 2016). This breeding habitat is considered critical to the survival of the species. Breeding occurs between November and March when the bird's nest in hollows or man-made boxes in Eucalypt Forest. The OBP Parrot is protected under the National Recovery Plan for the Orange-bellied Parrot (DELWP 2016).

April of each year begins the northern migration from breeding grounds in southern Tasmania to mainland Australia. The OBP sticks close to the coast (within 2 km) as it makes its way up the western coast of Tasmania (NRE Tas, 2023). It has been identified that the passage across the Bass Strait is aided by island hopping through the western Bass Strait Islands (e.g. Kind Island) where individuals are able to feed for days or weeks before continuing across the Strait. Sea Elephant River, King Island, has been considered migratory habitat critical for survival of the species (NRE Tas, 2023). From King Island, the OBP will distribute along the non-breeding range of the Victorian and South Australian coastline with sightings in NSW considered rare. Non-breeding feeding typically occurs in locations associated with coastal saltmarsh or sand dunes due to the foraging preferences of the species (DELWP, 2016). Roosting habitat is often within kilometres of foraging sites.

November of each year begins the southern migration from non-breeding grounds back across the Bass Strait to Melaleuca, Tasmania. This migration is far more rapid with observations suggesting that the species does not feed during passage, with a transit time from Victoria to Melaleuca as quick as 2 days in some cases (NRE Tas, 2023). It is assumed that the most direct route is taken to aid this and that the use of tail winds is taken advantage of during the passage due to the waves of arrivals that occur (NRE Tas, 2023).

Strict monitoring of this species occurs during the breeding season at Melaleuca by the Orange-bellied Parrot Tasmanian Program, which has committed to the protection, monitoring and management of the species in Tasmania. The Tasmanian state government committed $2.5 million to construct a captive breeding facility at Five Mile Beach which opened in July 2019 which has helped increase the number of captive-bred releases into the wild (NRE Tas, 2023). The latest update by NRE Tas stated that a total of 92 OBPs had safety made the migration back to breeding grounds in Melaleuca, which has made it the highest number of returns in the past decade (NRE Tas, 2025).

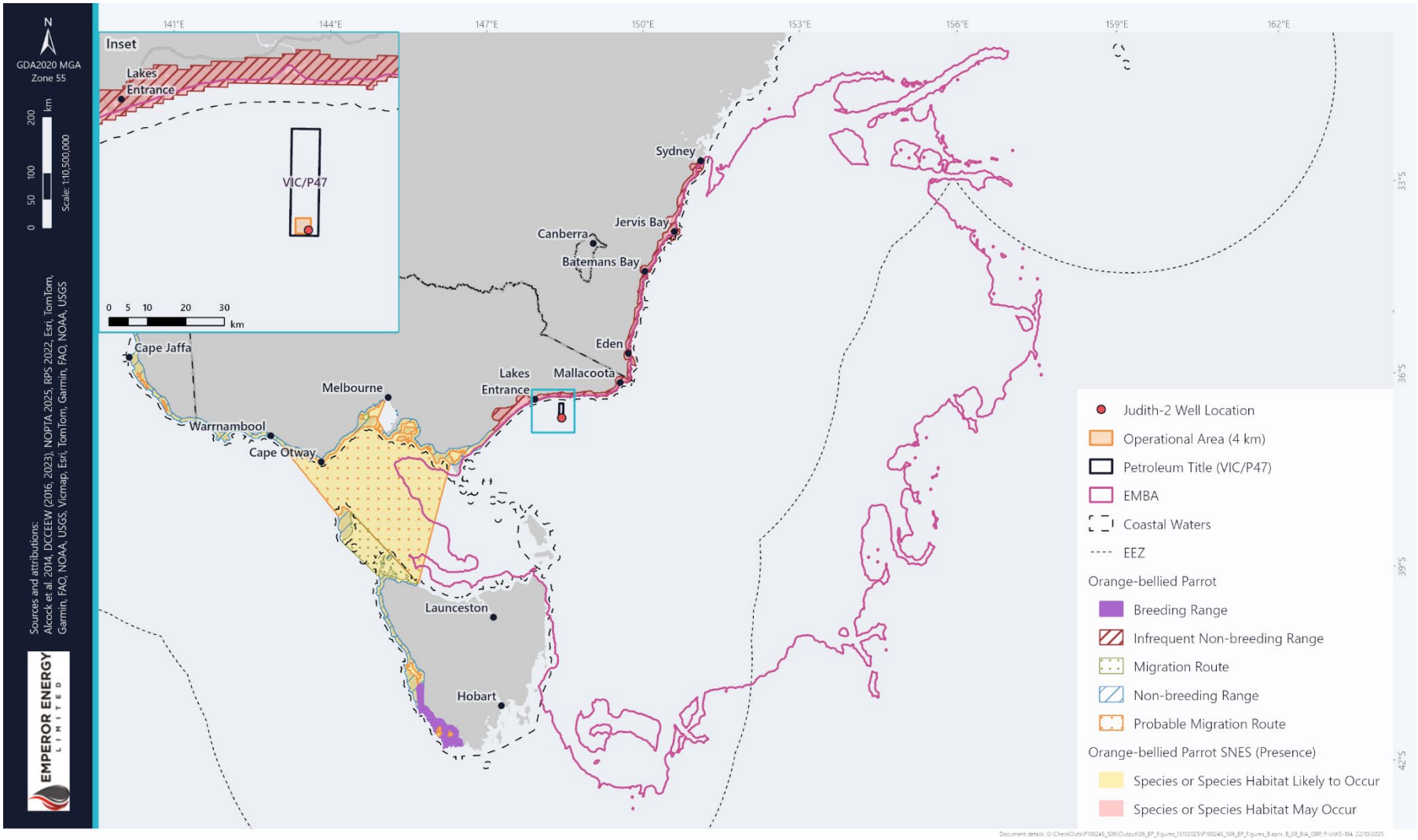


Figure 4-29: Orange-bellied Parrot Distribution and Migration routes

4.6.3. Fish

Fish species include the primitive jawless fish (hagfishes and lampreys), cartilaginous fish (sharks, rays and chimaeras), and the many and diverse groups of bony fishes (Bray, 2018). Fish habitats in Australia are varied and may include coral or rocky reefs, estuaries, and oceanic and deep-sea habitats beyond the continental slope. Almost a quarter of Australia's fishes are endemic, with 60% of these species living in the cooler southern waters (Hoese et al. 2006). Some fish species are listed as threatened and/or migratory under the *Environment Protection and Biodiversity Conservation Act 1999*, and these are considered a matter of national environmental significance. Species may also be protected under state and territory environmental legislation. All EPBC Act listed threatened and migratory fish species within the EMBA are listed in Table 4-5.

Additionally, within the EMBA there are certain species that exhibit biologically important behaviours, such as foraging, breeding or migrating which are crucial to the species success. There are two shark species which have BIAs overlapped by the EMBA. BIAs for these species are further discussed and listed below in Table 4-5. Several species identified by the PMST to occur within the EMBA are freshwater species and are not likely to inhabit marine habitats or rely on the marine environment for breeding or foraging. These species are not considered to be credibly impacted by the activity and have been excluded from this section and impact assessment. These species are listed in APPENDIX B .

Table 4-5: Listed fish species identified in the Operational Area and EMBAs

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	IMPULSIVE NOISE EMBA	CONTINUOUS NOISE EMBA	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Australian Grayling	*Prototroctes maraena*	V	-	-	-	-	-	KO	KO	National Recovery Plan for the Australian Grayling Conservation Advice *Prototroctes maraena* Australian Grayling
Australian Smooth Pipefish	*Lissocampus caudalis*	-	-	✓	-	-	-	MO	MO	-
Beady Pipefish	*Hippichthys penicillus*	-	-	✓	-	-	-	-	MO	-
Bentstick Pipefish	*Trachyrhamphus bicoarctatus*	-	-	✓	-	-	-	-	MO	-
Big-belly Seahorse	*Hippocampus abdominalis*	-	-	✓	MO	MO	MO	MO	MO	-
Black Rockcod	*Epinephelus daemelii*	V	-	-	-	-	-	LO	LO	Approved Conservation Advice for *Epinephelus daemelii* (black cod) Commonwealth listing advice on *Epinephelus daemelii* (black rock-cod)
Blue Warehou	*Seriolella brama*	CD	-	-	KO	KO	KO	KO	KO	Listing Advice Seriolella brama blue warehou
Brushtail Pipefish	*Leptoichthys fistularius*	-	-	✓	MO	MO	MO	MO	MO	-
Bullneck Seahorse	*Hippocampus minotaur*	-	-	✓	MO	MO	MO	MO	MO	-
Common Seadragon	*Phyllopteryx taeniolatus*	-	-	✓	MO	MO	MO	MO	MO	-
Crested Pipefish	*Histiogamphelus briggsii*	-	-	✓	MO	MO	MO	MO	MO	-
Deepbody Pipefish	*Kaupus costatus*	-	-	✓	MO	MO	MO	MO	MO	-
Double-end Pipehorse	*Syngnathoides biaculeatus*	-	-	✓	MO	MO	MO	MO	MO	-
Eastern Dwarf Galaxias	*Galaxiella pusilla*	E	-	-	-	-	-	MO	KO	National recovery plan for the Dwarf Galaxias (*Galaxiella pusilla*)
Eastern Gemfish	*Rexea solandri*	CD	-	-	LO	LO	LO	LO	LO	Commonwealth Listing Advice on *Rexea solandri*
Giant Manta Ray	*Mobula birostris*	-	✓ (M)	-	-	-	-	KO	KO	-
Girdled Pipefish	*Festucalex cinctus*	-	-	✓	-	-	-	-	MO	-
Grey Nurse Shark	*Carcharias taurus*		✓ (M)		MO	MO	MO	CKO	CKO	Recovery Plan for the Grey Nurse Shark (*Carcharias taurus*)

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	IMPULSIVE NOISE EMBA	CONTINUOUS NOISE EMBA	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Grey Nurse Shark (east coast population)	*Carcharias taurus*	CE	-	-	-	-	-	CKO	CKO	Commonwealth Listing Advice on Carcharias taurus, Grey Nurse Shark (East Coast population) Recovery Plan for the Grey Nurse Shark (*Carcharias taurus*)
Hairy Pipefish	*Urocampus carinirostris*	-	-	✓	MO	MO	MO	MO	MO	-
Halfbanded Pipefish	*Mitotichthys semistriatus*	-	-	✓	MO	MO	MO	MO	MO	-
Harrison's Dogfish	*Cetrophorus harrissoni*	CD	-	-	LO	LO	LO	LO	LO	Commonwealth Listing Advice on *Centrophorus harrissoni* (Harrisson's dogfish)
Javelin Pipefish	*Lissocampus runa*	-	-	✓	MO	MO	MO	MO	MO	-
Knifesnout Pipefish	*Hypselognathus rostratus*	-	-	✓	MO	MO	MO	MO	MO	-
Leafy Seadragon	*Phycodurus eques*	-	-	✓	-	-	-	MO	MO	-
Little Gulper Shark	*Cantrophorus uyato*	CD	-	-	LO	LO	LO	LO	LO	Commonwealth Listing Advice on *Centrophorus zeehaani* (southern dogfish
Longfin Mako	*Isurus paucus*	-	✓ (M)	-	-	-	-	-	LO	-
Longsnout Pipefish	*Vanacampus poecilolaemus*	-	-	✓	MO	MO	MO	MO	MO	-
Lorde Howe Pipefish	*Cosmocampus howensis*	-	-	✓	-	-	-	MO	MO	-
Mollison's Pipefish	*Mitotichthys mollisoni*	-	-	✓	-	-	-	MO	MO	-
Mother-of-pearl Pipefish	*Vanacampus margaritifer*	-	-	✓	MO	MO	MO	MO	MO	-
Oceanic Whitetip Shark	*Carcharhinus longimanus*	-	✓ (M)	-	MO	MO	MO	MO	LO	-
Orange Roughy	*Hoplostethus atlanticus*	CD	-	-	LO	LO	LO	LO	LO	-
Ornate Ghostpipefish	*Solenostomus paradoxus*	-	-	✓	-	-	-	-	MO	-
Porbeagle	*Lamna nasus*	-	✓ (M)	-	LO	LO	LO	LO	LO	-
Port Phillip Pipefish	*Vanacampus phillipi*	-	-	✓	MO	MO	MO	MO	MO	-
Pugnose Pipefish	*Pugnaso curtirostris*	-	-	✓	-	-	-	MO	MO	-
Red Handfish	*Thymichthys politus*	CE	-	-			-	MO	MO	Approved Conservation Advice for *Thymichthys politus* (red handfish)

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	IMPULSIVE NOISE EMBA	CONTINUOUS NOISE EMBA	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Red Pipefish	*Notiocampus ruber*	-	-	✓	MO	MO	MO	MO	MO	-
Reef Manta Ray	*Mobula alfredi*	-	✓ (M)	-	-	-	-	-	KO	-
Rhino Pipefish	*Histiogamphelus cristatus*	-	-	✓	MO	MO	MO	MO	MO	-
Ringback Pipefish	*Stipecampus cristatus*	-	-	✓	MO	MO	MO	MO	MO	-
Robust Ghostpipefish	*Solenostomus cyanopterus*	-	-	✓	-	-	-	MO	MO	-
Robust Pipehorse	*Solegnathus robustus*	-	-	✓	MO	MO	MO	MO	MO	-
Sawtooth Pipefish	*Maroubra perserrata*	-	-	✓	MO	MO	MO	MO	MO	-
Scalloped Hammerhead	*Sphyrna lewini*	CD	-	-	-	-	-	MO	LO	Listing Advice *Sphyrna lewini* scalloped hammerhead
School Shark (eastern)	*Galeorhinus galeus*	CD	-	-	LO	LO	LO	LO	LO	Commonwealth Listing Advice on *Galeorhinus galeus*
Shortfin Mako	*Isurus oxyrinchus*	-	✓ (M)	-	LO	LO	LO	LO	LO	-
Short-head Seahorse	*Hippocampus breviceps*	-	-	✓	MO	MO	MO	MO	MO	-
Shortpouch Pygmy Pipehorse	*Acentronura tentaculata*	-	-	✓	-	-	-	MO	MO	-
Spiny Pipehorse	*Stipecampus cristatus*	-	-	✓	MO	MO	MO	MO	MO	-
Spotted Pipefish	*Stigmatopora argus*	-	-	✓	MO	MO	MO	MO	MO	-
Tiger Pipefish	*Filicampus tigris*	-	-	✓	-	-	-	-	MO	-
Trawl Pipefish	*Kimblaeus bassensis*	-	-	✓	MO	MO	MO	MO	MO	-
Tucker's Pipefish	*Mitotichthys tuckeri*	-	-	✓	MO	MO	MO	MO	MO	-
Upside-down Pipefish	*Heraldia nocturna*	-	-	✓	MO	MO	MO	MO	MO	-
Whale Shark	*Rhinocodon typus*	V	✓ (M)	-	MO	MO	MO	MO	MO	Conservation Advice Rhincodon typus whale shark Commonwealth Listing Advice on *Rhincodon typus* (Whale shark)
White Shark	*Carcharodon carcharias*	V	✓ (M)	-	MKO	MKO	MKO	BKO	BKO	Recovery Plan for the White Shark (*Carcharodon carcharias*)
White's Seahorse	*Hippocampus whitei*	E	-	✓	-	-	-	KO	KO	Conservation Advice *Hippocampus whitei* White's Seahorse

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	IMPULSIVE NOISE EMBA	CONTINUOUS NOISE EMBA	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Widebody Pipefish	*Stigmatopora nigra*	-	-	✓	MO	MO	MO	MO	MO	-
Ziebell's Handfish	*Brachiopsilus ziebelli*	V	-	-	-	-		MO	MO	Recovery Plan for Three Handfish Species: Spotted handfish *Brachionichthys hirsutus*, Red handfish *Thymichthys politus* and Ziebell's handfish *Brachiopsilus ziebelli*

Threatened Species:
V – Vulnerable
E – Endangered
CE – Critically Endangered
CD – Conservation Dependent

Type of presence:
MO - Species or species habitat that may occur within the area
LO - Species or species habitat likely to occur within area
KO - Species or species habitat known to occur within area
FMO – Foraging may occur
FLO – Foraging likely to occur
FKO - Foraging known to occur
BKO – Breeding known to occur
CKO – Congregation known to occur

Migratory:
(M) – Migratory
(W) – Wetland

4.6.3.1. Handfish

Red Handfish

The Red Handfish (*Thymichthys politus*), belongs to the Brachionichthyidae family and is endemic to south-eastern Tasmania. These benthic species are characterised by their means of locomotion, using hand-like pectoral fins to crawl across the seafloor (DoE, 2015c). The Red Handfish inhabits a variety of marine environments, including rocky outcrops, macro-algae beds, sandy areas between rocks, and reef-sand interfaces at depths of up to 20 metres. Their diet consists primarily of small crustaceans and polychaete worms, which they forage for by crawling along the seafloor. Due to their small size, cryptic nature, and limited distribution, current population trends are difficult to determine.

The Red Handfish is an EPBC Act listed Critically Endangered species which may be found within the EMBA. Major threats to the species include habitat degradation and waterway pollution, while climate change and bioaccumulation of heavy metals are considered secondary threats. Their small population size, fragmented distribution, and low dispersal capacity significantly increase the risk of localised extinction due to stochastic events.

4.6.3.2. Sharks

White Shark

The White Shark (*Carcharodon carcharias*) is an EPBC protected species, listed as vulnerable and migratory, and is the only known fish or shark whose BIA has been identified to occur within the EMBA (Figure 4-30). White Sharks are active, fast-swimming predators equipped with counter-current heat exchangers in their circulatory system, allowing them to maintain body temperatures up to 14 °C higher than the surrounding seawater. This physiological adaptation enables them to tolerate a broad range of water temperatures (Goldman 1997). They are highly mobile species and widely distributed throughout temperate and sub-tropical regions in the northern and southern hemispheres. The White Shark is primarily found in coastal and offshore areas of the continental shelf and islands, generally observed between the coast and the 100 m depth contour (Bruce et al. 2006).

White sharks are commonly observed in proximity to seal colonies, particularly when juvenile seals are present, as they serve as a primary food source (CoA 2015). Their diet includes a variety of other prey including fish, other sharks and rays, marine mammals, squid, and crustaceans (CoA 2015). A recent study has found that the energy requirements of adult White Sharks may be several times higher than previously estimated, and that seasonal feeding on seal colonies is important in meeting these energy needs (CoA 2015).

Studies of White sharks sighted at pinniped colonies indicate the sharks appear to be largely transient with only a few long-term residents (Milankovic et al. 2021). The location of shark pupping areas in Australia is not known, however juveniles aggregate seasonally in certain areas such as Goolwa (SA), Corner Inlet-Lakes Entrance (Vic), Newcastle-Foster (NSW), Fraser Island (Qld) and Portland (Vic) (161 km northwest) (DoE 2014). White sharks appear to return to specific areas on a seasonal basis and show a degree of site fidelity (Bruce and Bradford 2008). They are known to make excursions into the open ocean and cross ocean basins with exchange between Australia and both South Africa and New Zealand recorded (CoA 2020b).

The South-West Commonwealth Marine Reserves Network Management Plan 2013 – 2023 (DNP 2013) recognises that White Sharks forage in the Apollo and Zeehan Commonwealth Marine Reserve. The known distribution of BIAs, highlights regions used by White Sharks during their movements between nursery habitats, particularly by juveniles during the autumn, winter, and spring seasons (DAWE 2020). The White

Shark may transit the Operational Area and EMBA to nursery and foraging locations during the planned activity.

Grey Nurse Shark (east coast population)

The Grey Nurse Shark (east coast population) (*Carcharias taurus*) is an EPBC protected species, listed as Critically Endangered and has been identified to exhibit biologically important behaviours within the EMBA (Figure 4-31). In Australia, there are two distinct Grey Nurse Shark populations; one on the west coast and the other on the east coast. The Grey Nurse Shark typically inhabits inshore coastal regions in cool temperate to sub-tropical waters on the continental shelf (CoA, 2014). The east coast population, whose distribution is overlapped by the EMBA, spans from the Capricornia coast, QLD to Narooma, NSW. Within this region, Grey Nurse Sharks undertake migratory movements along the coast, likely in response to changes in water temperature (DoE, 2023). These movements can vary depending on the sex of the individuals, with males commonly observed in southern Queensland during the winter months, while females are typically found off the central coast of New South Wales during the same season (DoE, 2023). The EMBA overlaps a portion of this migration BIA for the Grey Nurse Shark, along the southern NSW coastline.

Grey Nurse Sharks tend to aggregate in groups at specific locations along their coastal range. These aggregation sites are considered to be critical to the survival of the species in the Recovery Plan for the Grey Nurse Shark (2014). Key aggregation sites have been defined as locations where five or more Grey Nurse Sharks were consistently found throughout the year, 13 of which occur within NSW waters (Otway and Burke, 2004). It is thought that sites may play an important role in pupping and/or mating activities. The diet of the Grey Nurse Shark includes a variety of species, typically of commercial interest. This includes a wide range of fish, other sharks and rays, squids, and invertebrates (DoE, 2023). The EMBA overlaps a portion of the foraging BIA for the species along the southern NSW coastline.

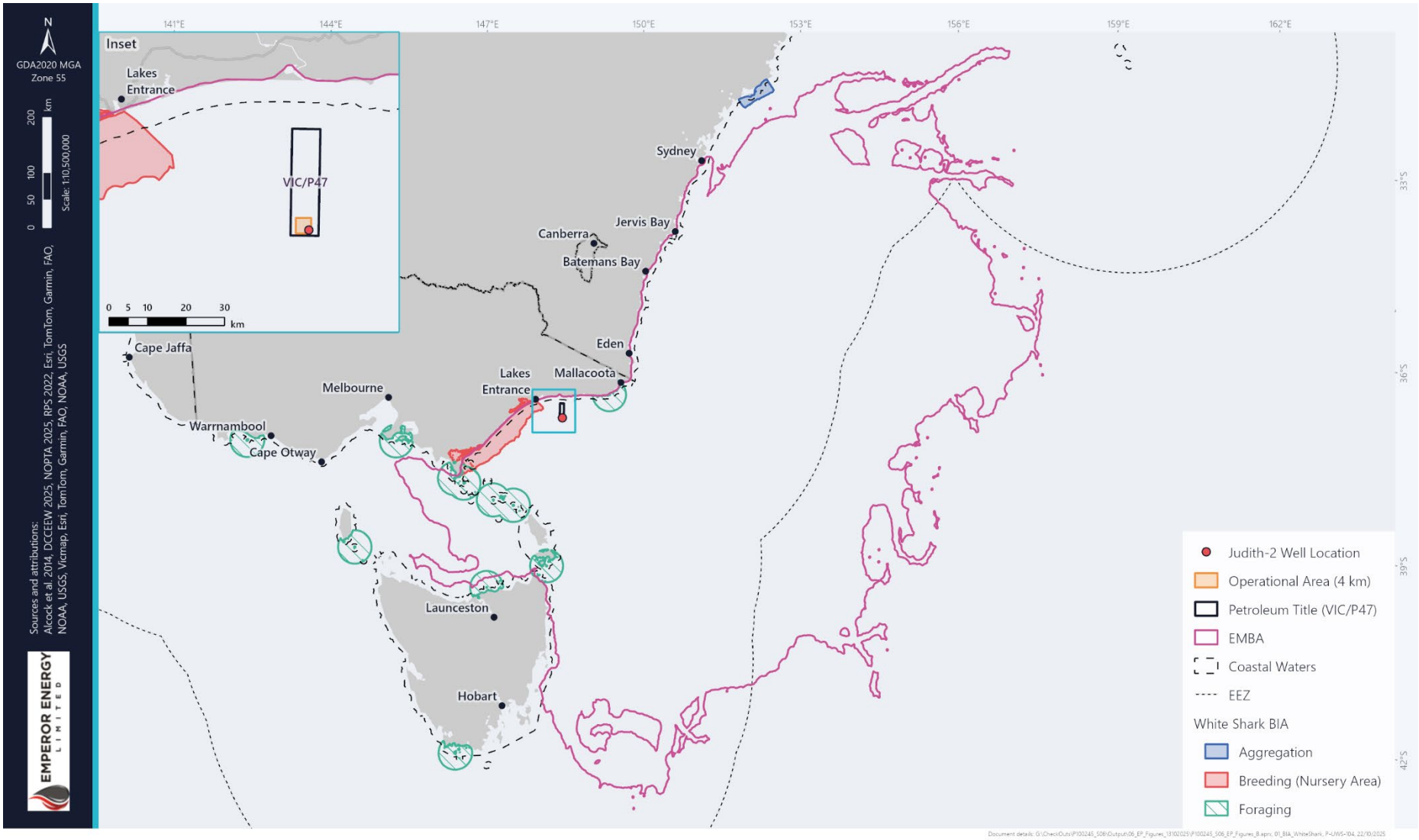


Figure 4-30: White Shark Biologically Important Areas within the EMBA

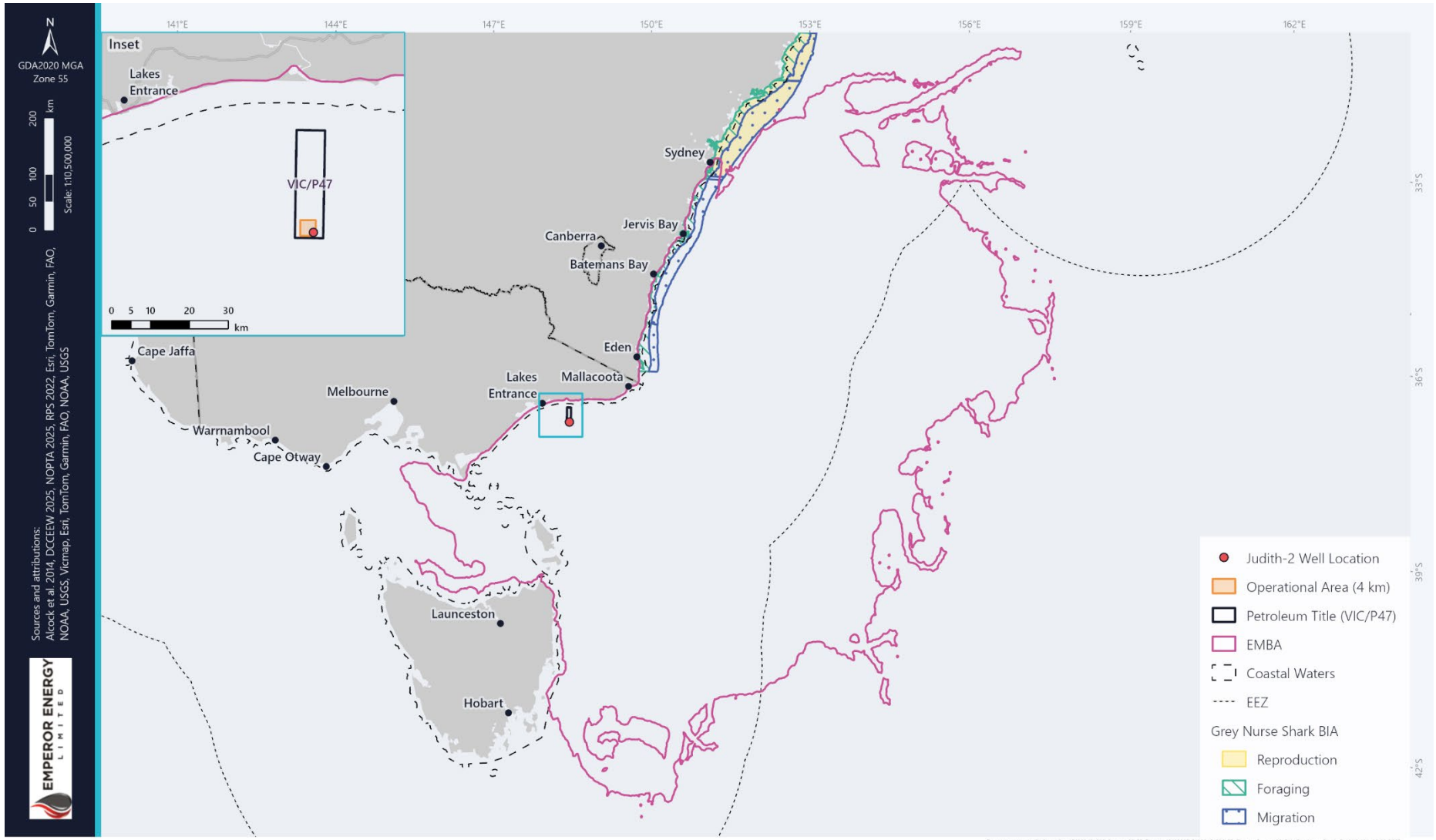


Figure 4-31: Grey Nurse Shark Biologically Important Areas within the EMBA

4.6.3.3. Eels

The shortfin eel (*Anguilla australis australis*) and longfin eel (*A. reinhardtii*) are both present in Victoria and represent the main species harvested by the Victorian Eel Fishery. Their habitats overlap across estuarine and freshwater systems located east and south of the Great Dividing Range (VFA 2022b) (Error! Reference source not found.).

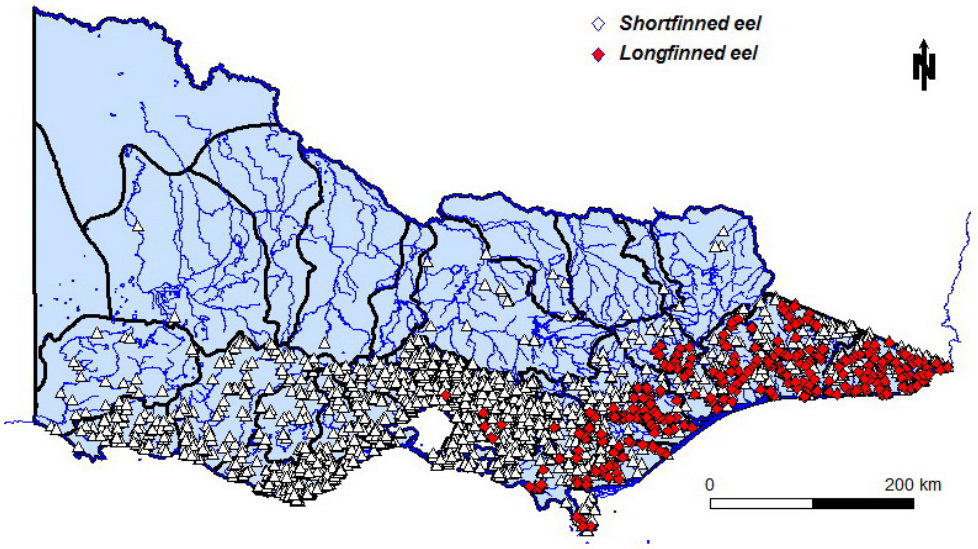


Figure 4-32: Distribution of Longfinned and Shortfinned Eels in Victoria (VFA 2017)

The shortfin eel occurs widely throughout southern Victoria and is occasionally recorded in northern waterways flowing into the Murray River. In contrast, the longfin eel's distribution is limited to south-eastern regions of the state (VFA, 2022a). Both species spend most of their lives in freshwater or estuarine environments before undertaking a single oceanic migration to spawn, after which they die (VFA, 2022a). The shortfin eel is listed as 'Near Threatened' on the IUCN Red List, with key threats including loss of freshwater habitat and impediments to riverine connectivity. Additional pressures such as altered ocean currents, shifts in primary productivity, and changes to thermal regimes may also influence migration, spawning, and recruitment success (Koster et al., 2021). The longfin eel is assessed as 'Least Concern' by the IUCN, and neither species is listed as threatened under the EPBC Act.

Both eel species are mainly carnivorous but are known to consume plant matter opportunistically (VFA, 2022a; 2022c). The diet of the shortfin eel includes fish, worms, insects, small crustaceans, molluscs, and aquatic vegetation, and individuals may reach lengths of up to 1.1 m and weights of approximately 6.8 kg (VFA, 2022a). The longfin eel primarily feeds on fish and insects and typically attains lengths around 1 m, though some individuals can grow to 2 m and weigh up to 16 kg (VFA, 2022c). Both species exhibit a seasonal feeding cycle, feeding most actively at night during spring and summer (VFA, 2022a; 2022c). Sex determination in both species is influenced by environmental and biological factors such as salinity, temperature, diet, and population density, with a tendency for lower population densities to result in a higher proportion of females (VFA, 2017).

Migration and Spawning

The life cycle of both eel species is extraordinary and still not fully understood, remaining one of nature's more complex migratory phenomena. Shortfin and longfin eels spend most of their lives in freshwater and estuarine environments before undertaking a single, large-scale oceanic migration of more than 3,000 km

to spawn (VFA, 2022b). Although the exact location of the spawning grounds are yet to be confirmed, it is generally believed that spawning occurs in the Coral Sea region near New Caledonia (VFA, 2022a). Migration begins once the eels reach sexual maturity, which is typically between 8 and 12 years for male shortfin eels and 10 to 20 years for females, while longfin eels may take up to twice as long to mature. This migration generally occurs from late summer through autumn, following a period of rapid feeding and growth during which the eels undergo notable physiological changes to prepare for their oceanic journey (VFA, 2022a).

When ready to spawn, the eels depart freshwater systems under the cover of darkness, moving northward against prevailing currents toward the Coral Sea. During the migration, their energy reserves are gradually depleted, which results in death occurring after spawning, completing their semelparous life cycle. The larvae begin life at unknown depths, which is estimated around 200 m, where they drift with ocean currents as transparent, leaf-shaped leptocephalus larvae. These pelagic larvae are transported southward by the East Australian Current and its associated flows, which extend past Tasmania before turning east toward New Zealand. During this drift phase, larvae feed on microscopic plankton and gradually develop into 'glass eels', which are small, transparent, eel-shaped juveniles. The glass eels then move toward coastal areas and estuaries, where they begin their upstream migration. Seasonal differences occur in timing, with shortfin glass eels typically migrating during winter and spring, and longfin glass eels during summer and autumn, although recruitment may occur throughout the year (VFA, 2017; VFA, 2022a).

Koster et al. (2021) documented the first tracking study of shortfin eel migration in Australia, tagging 16 eels from the Hopkins and Fitzroy River estuaries as they commenced their oceanward migration in 2019. Tagged eels were released at Warrnambool Harbour, the Hopkins River mouth, and Killarney Beach, with data successfully retrieved from 12 individuals. The study revealed diel vertical migration behaviour, with eels occupying surface waters at night and deeper waters during the day (Koster et al., 2021). A small number of tagged individuals completed their migration to the Coral Sea, while approximately 30% were lost to predation, likely by large fish or marine mammals. The study concluded that further investigation is required to determine precise spawning locations and timing, and to inform conservation and management strategies. Koster et al. (2021) also identified that construction and operation of marine energy developments have the potential to interact with eel migration pathways.

Victorian Eel Fishery

The Victorian Eel Fishery targets both the shortfin eel (*Anguilla australis australis*) and the longfin eel (*A. reinhardtii*). Commercial harvesting of eels in Victoria began in 1914, with early catches mainly used for bait until around 1950. The export of frozen shortfin eels to European markets commenced during the 1960s (VFA, 2022a). Eels are caught across coastal river basins located south of the Great Dividing Range, predominantly using fyke nets, and the Victorian fishery is limited to a maximum of 18 licences. Several waterways are closed to fishing to allow for natural escapement of mature eels for spawning purposes (VFA, 2022a). The shortfin eel remains the most abundant and commercially significant species, although fishery productivity is highly influenced by environmental variability, including seasonal changes and prolonged drought conditions (VFA 2017). The fishery operates across two sectors, the wild-catch sector and the culture (stock-enhanced) sector. The culture sector supports sustainable harvest by translocating juvenile eels from other parts of Victoria into designated lakes and impoundments in western inland regions, where they are grown out in controlled conditions (VFA, 2017). Fishing for glass eels has achieved limited success due to fluctuating natural abundance in Victorian waters. Most of the state's commercial eel catch consists of adult eels at varying stages of their migratory cycle. Cultural Significance of Eels Eels have long held cultural, social, and economic importance for many First Nations communities across Victoria. Prior to colonisation, eels were widely used for trade, barter, and communal gatherings, and they continue to be valued as a traditional food source at community events today (VFA 2017). Shortfin eels, in particular, are of

deep cultural significance to First Nations people. The Gunditjmara people of south-western Victoria developed and managed intricate aquaculture systems within the Budj Bim Cultural Landscape more than 7,000 years ago, designed to capture and manage eel migrations. These engineered systems supported a sustainable food source and provided the foundation for long-term social and economic stability within Gunditjmara society (Koster et al. 2021). The Budj Bim Cultural Landscape and Sea Country is located outside the EMBA.

4.6.3.4. Commercially Important Fish Species

Blue Warehou

The Blue Warehou (Seriolella brama) is a bentho-pelagic species that inhabits continental slope waters at depths of 50-300 m (AFMA 2024a) and is listed as Conservation Dependent under the EPBC Act. The Blue Warehou is a targeted species within the Southern and Eastern Scalefish and Shark Fishery (SESSF) Commonwealth Trawl and Scalefish Hook sectors. There are 2 separate stocks of the Blue Warehou: east and west. The eastern stock extends from southern New South Wales to southern Tasmania and the western stock extends offshore from western Tasmania northward to western Victoria (Bessell-Browne et al. 2021). Both the western and eastern stocks of the Blue Warehou are considered to be long-term overfished, showing no demonstrable recovery (Butler et al. 2024).

Eastern Gemfish

The Eastern Gemfish (*Rexea solandri*) is a bottom-dwelling species that inhabits temperate waters of Australia and New Zealand, typically in large schools at water depths of 100-800 m (AFMA 2024b) and is listed as Conservation Dependent under the EPBC Act. The Eastern Gemfish typically preys on bentho-pelagic fish such as grenadier in addition to squid and crustaceans (AFMA 2024b). Female Eastern Gemfish reach reproductive maturity at 4-6 years and males at 3-5 years, with spawning occurring in northern and central New South Wales during winter (AFMA 2024b). The species is incidentally caught in the SESSF Commonwealth Trawl sector and the Gillnet Hook and Trap sector. The Eastern Gemfish has been classified as overfished since 1992 and a rebuilding strategy established the eastern gemfish as an incidental catch-only species, which was implemented in 2008 (Butler et al. 2024).

Gummy Shark

Gummy Sharks (*Mustelus antarcticus*) are a demersal species that inhabits the continental shelf at depths of 80-350 m (AFMA 2024c). The species typically remains on or near the surface feeding on cephalopods, crustaceans and occasionally fish. Newborn and juvenile Gummy Sharks aggregate across southern Australia, with adults more widely distributed. Gummy Sharks reach reproductive maturity at 4-5 years of age, with males maturing at a smaller size. The females are ovoviviparous, producing litters of about 14-57 pups during the summer months after an 11–12-month gestation period (AFMA 2024c).

The Gummy Shark is a key targeted species within the SESSF Gillnet Hook and Trap sector, and incidentally caught in the Commonwealth Trawl Sector (Butler et al. 2024). The species is mainly caught in southern Australia, extending from Bunbury in Western Australia to Jervis Bay in New South Wales (White and Last 2008). As of 2024, the Gummy Shark is classified as not overfished (Butler et al. 2024).

Orange Roughy

Orange Roughy (*Hoplostethus atlanticus*) is listed as Conservation Dependent under the EPBC Act. The Orange Roughy is a deep-water species that inhabits waters over steep continental slopes and ocean ridges at water depths between 700-1,400 m (AFMA 2024d). The species usually aggregate 5-10 m above the seabed, with some extending over 50 m from the seafloor, and are associated with submerged hills or

pinnacles (AFMA 2024d). At these depths, Orange Roughy prey on benthopelagic and meso-pelagic fish such as viperfish, lanternfish, whiptails, squid, crustaceans, amphipods and mysids (AFMA 2024d). The Orange Roughy reaches reproductive maturity at 27-32 years of age with spawning aggregations occurring between mid-July and late August.

The Orange Roughy is targeted within the SESSF Commonwealth Trawl Sector and incidentally caught within the Great Australian Bight Trawl (Butler et al. 2023). The species has been historically targeted in aggregations around seamounts, mainly at depths from 600-1,300 m (Butler et al. 2023). The Orange Roughy is considered to be long-term overfished in the southern and western zones, showing no demonstrable recovery. However, the eastern zone Orange Roughy is not overfished or subject to overfishing and accounts for the second most valuable stock in the Commonwealth Trawl Sector and Scalefish Hook Sector of the SESSF (Butler et al. 2024).

School Shark

The School Shark (*Galeorhinus galeus*) is a temperate demersal species found on the continental shelf and slop at depths of 550 m (AFMA 2024e). The species undertakes long migrations of up to 1,400 km along the southern coast of Australia, which may be associated with mating and pupping grounds (AFMA 2024e). The School Shark reaches reproductive maturity at 8-15 years of age, with the females producing litters of 15-42 pups every 2-3 years (AFMA 2024e). Birth occurs in early summer after 12 months gestation period. The pups and juveniles tend to aggregate in shallower waters during the spring and summer.

School Sharks were historically the primary target species within the SESSF Shark Gillnet and Shark Hook sector. Assessments for the School Shark indicate that the stock has been overfished since approximately 1990 (Butler et al. 2024). Although overfished, the School Shark remains the second most economically important stock in the fishery (Butler et al. 2024).

Southern Bluefin Tuna

The Southern Bluefin Tuna (*Thunnus maccoyii)* is a highly migratory, pelagic species and is distributed throughout the Atlantic, Pacific and Indian Oceans. The species inhabits water depths of 500 m, feeding on fish, cephalopods, crustaceans and salps (AFMA 2024f). In Australia, the Southern Bluefin Tuna are mainly found in the Great Australian Bight and typically caught between December to April (AFMA 2024f). The species reaches reproductive maturity at 11-12 years of age, with spawning occurring in tropical waters during spring and summer (AFMA 2024f). Only one spawning ground has been identified, in the north-eastern Indian Ocean, south of Java (AFMA 2024f). The juveniles are generally associated with coastal and continental shelf waters.

The Southern Bluefin Tuna is a key targeted species within the Southern Bluefin Tuna Fishery and Eastern Tuna and Billfish Fishery. The species is not considered to be overfished (Butler et al. 2024).

4.6.4. Marine Mammals

Marine mammals are warm blooded, breathe air through lungs, produce milk to nurse their young and live in the marine environment for all or part of their life. Marine mammal taxonomic groups found in Australian waters include cetaceans (whales, dolphins, porpoises), pinnipeds (seals and sea lions,) and sirenians (dugongs). Some marine mammals are listed as threatened and/or migratory under the *Environment Protection and Biodiversity Conservation Act 1999*, and these are considered to be a matter of national environmental significance (MNES). Species may also be protected under state and territory environmental legislation. All EPBC Act listed threatened and migratory marine mammal species within the EMBA are listed in APPENDIX B .

Thirteen species of marine mammals have been listed in the PMST search, as having likely or known presence in the EMBA. and are discussed further below. Additionally, within the EMBA there are certain species that will exhibit biologically important behaviours, such as foraging, breeding or migrating which are crucial to the species success. Of these 13 species within the EMBA, four species including the Southern Right Whale, Pygmy Blue Whale and Humpback Whale, and the Indo-Pacific Bottlenose Dolphin have BIAs within the EMBA. Only the Southern Right Whale and Pygmy Blue Whale have BIAs overlapping the Operational Area, for migration and distribution/foraging behaviours respectively. These species are discussed further below (Table 4-6), and their BIAs are listed in Table 4-3.

Several species identified by the PMST to occur within the EMBA are terrestrial species and are not likely to inhabit coastlines or rely on the marine environment for breeding or foraging. These species are not considered to be credibly impacted by the activity and have been excluded from this section and impact assessment. These species are listed in APPENDIX B .

Table 4-6: Listed marine mammal species identified in the Operational and EMBAs

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	IMPULSIVE NOISE EMBA	CONTINUOUS NOISE EMBA	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Andrew's Beaked Whale	*Mesoplodon bowdoini*	-	-	-	MO	MO	MO	MO	MO	-
Antarctic Minke Whale	*Balaenoptera bonaerensis*	-	✓(M)	-	LO	LO	LO	LO	LO	-
Arnoux's Beaked Whale	*Berardius arnuxii*	-	-	-	MO	MO	MO	MO	MO	-
Australian Fur-seal	*Arctocephalus pusillus*	-	-	✓	MO	MO	MO	BKO	BKO	-
Blainville's Beaked Whale	*Mesoplodon densirostris*	-	-	-	MO	MO	MO	MO	MO	-
Blue Whale	*Balaenoptera musculus*	E	✓(M)	-	LO	LO	LO	LO	LO	Conservation Management Plan for the Blue Whale
Bottlenose Dolphin	*Tursiops truncatus s. str.*	-	-	-	MO	MO	MO	MO	MO	-
Bryde's Whale	*Balaenoptera edeni*	-	✓(M)	-	MO	MO	MO	LO	LO	-
Common Dolphin	*Delphinus delphis*	-	-	-	MO	MO	MO	MO	MO	-
Cuvier's Beaked Whale	*Ziphius cavirostris*	-	-	-	MO	MO	MO	MO	MO	-
Dugong	*Dugong dugon*	-	✓(M)	✓	-	-	-	MO	MO	-
Dusky Dolphin	*Lagenorhynchus obscurus*	-	✓(M)	-	LO	LO	LO	LO	LO	-
Dwarf Sperm Whale	*Kogia sima*	-	-	-	MO	MO	MO	MO	MO	-
False Killer Whale	*Pseudorca crassidens*	-	-	-	LO	LO	LO	LO	LO	-
Fin Whale	*Balaenoptera physalus*	V	✓(M)	-	FLO	FLO	FLO	FLO	FLO	Conservation Advice Balaenoptera physalus fin whale
Gingko-toothed Beaked Whale	*Mesoplodon ginkgodens*	-	-	-	-	-	-	MO	MO	-
Gray's Beaked Whale	*Mesoplodon grayi*	-	-	-	-	-	-	MO	MO	-
Hector's Beaked Whale	*Mesoplodon hectori*	-	-	-	MO	MO	MO	MO	MO	-
Humpback Whale	*Megaptera novaeangliae*	-	✓(M)	-	KO	KO	KO	FKO	FKO	-

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	IMPULSIVE NOISE EMBA	CONTINUOUS NOISE EMBA	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Indo-Pacific Spotted Bottlenose Dolphin	*Tursiops aduncus*	-	-	-	-	-	-	LO	LO	-
Killer Whale	*Orcinus orca*	-	✓(M)	-	LO	LO	LO	LO	LO	-
Long-finned Pilot Whale	*Globicephala melas*	-	-	-	MO	MO	MO	MO	MO	-
Long-nosed Fur-seal, New Zealand Fur-seal	*Arctocephalus forsteri*	-	-	✓	MO	MO	MO	MO	MO	-
Long-snouted Spinner Dolphin	*Stenella longirostris*	-	-	-	-	-	-		MO	-
Melon-headed Whale	*Peponocephala electra*	-	-	-	-	-	-	MO	MO	-
Minke Whale	*Balaenoptera acutorostrata*	-	-	-	MO	MO	MO	MO	MO	-
Pygmy Killer Whale	*Feresa attenuata*	-	-	-	-	-	-	MO	MO	-
Pygmy Right Whale	*Caperea marginata*	-	✓(M)	-	FLO	FLO	LO	FLO	FLO	-
Pygmy Sperm Whale	*Kogia breviceps*	-	-	-	MO	MO	MO	MO	MO	-
Risso's Dolphin	*Grampus griseus*	-	-	-	MO	MO	MO	MO	MO	-
Rough-toothed Dolphin	*Steno bredanensis*	-	-	-	-	-	-	MO	MO	-
Sei Whale	*Balaenoptera borealis*	V	✓(M)	-	FLO	FLO	FLO	FLO	FLO	Conservation Advice Balaenoptera borealis sei whale
Shepherd's Beaked Whale	*Tasmacetus shepherdi*	-	-	-	-	-	-	MO	MO	-
Short-finned Pilot Whale	*Globicephala macrorhynchus*	-	-	-	MO	MO	MO	MO	MO	-
Southern Bottlenose Whale	*Hyperoodon planifrons*	-	-	-	-	-	-	MO	MO	-
Southern Right Whale	*Eubalaena australis*	E	✓(M)	-	KO	KO	KO	BKO	BKO	National Recovery Plan for the Southern Right Whale (DCCEEW 2024)
Southern Right Whale Dolphin	*Lissodelphis peronii*	-	-	-	MO	MO	MO	MO	MO	-
Sperm Whale	*Physeter macrocephalus*	-	✓(M)	-	MO	MO	MO	MO	MO	-
Spotted Dolphin	*Stenella attenuata*	-	-	-	-	-	-		MO	-

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	IMPULSIVE NOISE EMBA	CONTINUOUS NOISE EMBA	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Strap-toothed Beaked Whale	*Mesoplodon layardii*	-	-	-	MO	MO	MO	MO	-	-
Striped Dolphin	*Stenella coeruleoalba*	-	-	-	-	-	-		MO	-
True's Beaked Whale	*Mesoplodon mirus*	-	-	-	MO	MO	MO	MO	MO	-

Threatened Species:

V – Vulnerable

E – Endangered

CE – Critically Endangered

CD – Conservation Dependent

Type of presence:

MO - Species or species habitat that may occur within the area

LO - Species or species habitat likely to occur within area

KO - Species or species habitat known to occur within area

FMO – Foraging may occur

FLO – Foraging likely to occur

FKO - Foraging known to occur

BKO – Breeding known to occur

RLO – Roosting likely to occur

RKO – Roosting known to occur

Migratory:

(M) – Migratory

(W) – Wetland

4.6.4.1. Whales

Southern Australia Whale Surveys

Whale surveys were undertaken in the off southern Australia between 2002 and 2013. Gill et al. (2015) summarised cetacean observations from 123 systematic aerial surveys conducted across western Bass Strait and the eastern Great Australian Bight between 2002 and 2013. These surveys did not include data for blue whales, which have been reported separately by Gill et al. (2011) (see the section on blue whales).

Across all surveys, 133 sightings of 15 cetacean species were recorded, including seven mysticete (baleen) whale species, eight odontocete (toothed) species, and 384 sightings of dolphins (Table 4-7 and Error! Reference source not found.). Survey effort was primarily focused on the upwelling season, corresponding to the seasonal occurrence of pygmy blue whales from November to April, with 103 of 123 surveys conducted during this period. Relatively little survey effort occurred between 2008 and 2011. The cetacean species recorded in the region are summarised in the sections below.

Southern right whales and humpback whales were most frequently observed from May to September, despite relatively low survey effort during these months. Southern right whales were not observed from October to May. Fin whales, sei whales, and pilot whales were sighted only during the upwelling season from November to May, although this may reflect both their natural scarcity and limited survey effort outside this period. Dolphins were observed more consistently across the survey years. Gill et al. (2015) noted that uneven seasonal survey effort and the rarity of most species limit the conclusions that can be drawn regarding temporal occurrence.

Table 4-7: Cetacean Species Recorded during Aerial Surveys 2002–2013 in Southern Australia (Gill et al., 2015)

TAXON	COMMON NAME	SPECIES GROUP*	SIGHTINGS	INDIVIDUAL	MEAN GROUP SIZE (+/- SD)
Baleen Whales					
Eubalaena australis	*Southern right whale*	*SRW*	*12*	*52*	*4.2 +/- 4.2*
Caperea marginata	*Pygmy right whale*		*1*	*100*	*100*
Balaenoptera physalus	*Fin and like fin whale*	*ROR*	*7*	*8*	*1.1 +/- 0.4*
B. borealis	*Sei and like sei whale*	*ROR*	*12*	*14*	*1.3 +/- 0.5*

TAXON	COMMON NAME	SPECIES GROUP*	SIGHTINGS	INDIVIDUAL	MEAN GROUP SIZE (+/- SD)
B. acutorostrata	*Dwarf minke whale*	*ROR*	*1*	*1*	*1*
B. bonaerensis	*like Antarctic minke whale*	*ROR*	*1*	*1*	*1*
Megaptera novaeangliae	*Humpback whale*	*ROR*	*10*	*18*	*1.8 +/- 1.0*
Toothed Whales					
Physeter macrocephalus	*Sperm whale*	*ODO*	*34*	*66*	*1.9 +/- 2.2*
Mesoplodon spp.	*Unidentified beaked whales*	*ODO*	*1*	*20*	*20*
Orcinus orca	*Killer whale*	*ODO*	*6*	*21*	*3.5 +/- 2.8*
Globicephala melas	*Longfinned pilot*	*ODO*	*40*	*1853*	*46.3 +/- 46.7*
Grampus griseus	*Risso's dolphin*	*ODO*	*1*	*40*	*40*
Lissodelphis peronii	*Southern right whale dolphin*	*ODO*	*1*	*120*	*120*
Tursiops spp.	*Bottlenose dolphin*	*DOL*	*4*	*363*	*90.8 +/- 140.1*
	Dolphins	*DOL*	*384*	*22169*	*58 +/- 129.6*
Unidentified large whales			*3*	*3*	*1*

TAXON	COMMON NAME	SPECIES GROUP*	SIGHTINGS	INDIVIDUAL	MEAN GROUP SIZE (+/- SD)
Unidentified small whales			*2*	*2*	*1*

SRW = southern right whales; ROR = rorquals; ODO = other odontocetes; DOL = dolphins.

Pygmy Blue Whale

The Pygmy Blue Whale (PBW) (*Balaenoptera musculus brevicauda*) is a subspecies of the blue whale. It is an EPBC protected species, listed as Endangered and has been identified to exhibit biologically important behaviours within the EMBA and Operational Area (Error! Reference source not found.). The blue whale is a cosmopolitan species found in all oceans except the Arctic, although it is absent from some enclosed seas such as the Mediterranean, Okhotsk, and Bering seas. Knowledge of breeding behaviour and mating grounds remains limited. Pygmy blue whales generally occur north of 55°S, while Antarctic blue whales are mostly sighted south of 60°S in Antarctic waters. Pygmy blue whales are particularly abundant in the southern Indian Ocean, including the Madagascar Plateau, and along the coasts of South Australia and Western Australia, forming a near-continuous distribution from Tasmania to Indonesia. The Otway region is an important area for migration and foraging, as shown by aerial surveys and passive acoustic monitoring (Gavrilov, 2012; McCauley et al., 2018; Gill et al., 2011 (Error! Reference source not found.)).

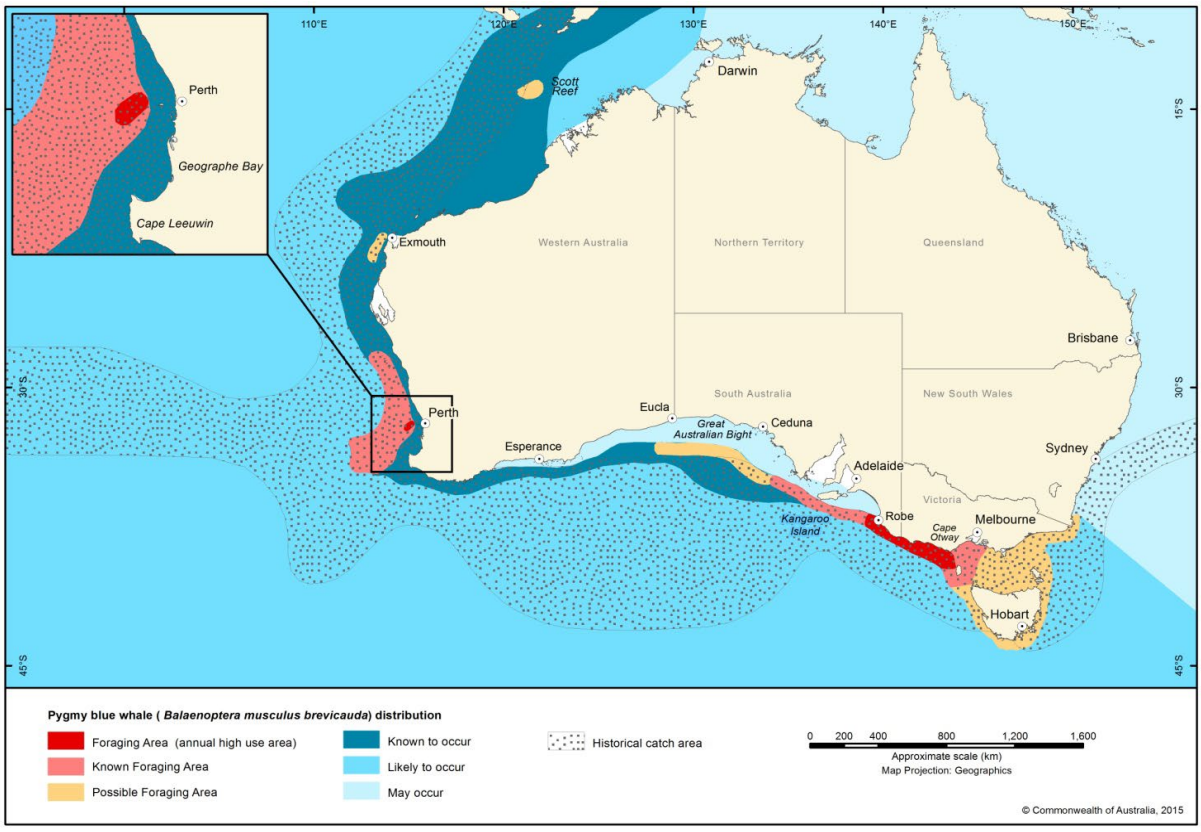


Figure 4-33: Pygmy Blue Whale distribution around Australia (CoA, 2015a)

The PBW has the highest known prey requirements of any predator, requiring foraging grounds to be areas of high productivity with sufficient densities of krill, such as oceanographic upwelling or frontal systems (CoA, 2015a). Within Australia, known areas of significance to this species coincide with seasonal foraging grounds, located at the Perth Canyon, WA and the Bonney Upwelling System, VIC and SA, both of which are outside of the EMBA (Error! Reference source not found.). Individuals' frequent locations between November and May in high densities. Outside of these seasonal feeding grounds the species is known to forage within the greater region around the Perth Canyon, off Exmouth and Scott Reef in WA, in the Bass Strait off Victoria and diving and presumably feeding off the west coast of Tasmania (CoA, 2015a).

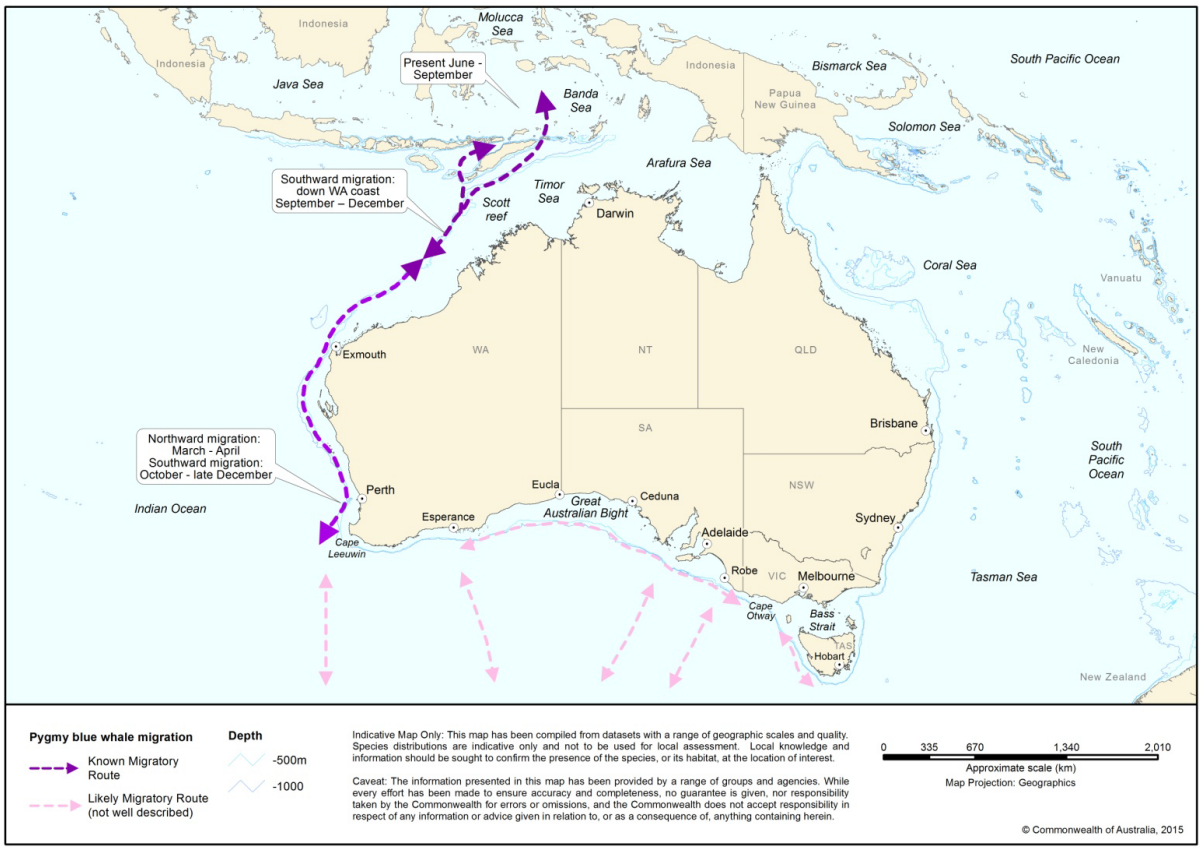


Figure 4-34: Pygmy Blue Whale migration routes (CoA, 2015a)

Blue whales are classified as "constant foragers," continuously searching for patchily distributed krill, preferentially targeting high-reward patches (Torres et al., 2020). While physically capable of rapid transit between distant foraging areas (Woodward et al., 2006), their search strategy within potential krill habitats involves area-restricted searches (ARS), characterized by zig-zagging movements (Abrahms et al., 2019). This pattern continues until prey is located or local resources are deemed insufficient, at which point the whales are presumed to relocate to other potential foraging grounds based on prior experience. Therefore, it is assumed that once feeding is complete, blue whales will depart the current feeding area to initiate a search for new resources.

Important foraging areas for blue whales include the Great Australian Bight in South Australia and waters off Portland, Victoria, where whales typically feed between December and June on krill associated with the inshore shelf break (Error! Reference source not found.). Seasonal arrival in eastern waters generally coincides with upwelling events along the coast, known as the Bonney Upwelling, which supports aggregations of krill (Gill and Morrice, 2003). The Bonney Upwelling usually begins in the eastern Great Australian Bight in November or December and progresses eastwards to the Otway Basin by February as

the southward migration of the subtropical high-pressure system generates upwelling-favourable winds. Blue whale sightings indicate that their distribution is strongly seasonal (Gill et al., 2011; McCauley et al., 2018).

Blue whale abundance varies annually and is influenced by climatic factors. Two key seasonal feeding aggregation areas are recognised in southern Australia: the Bonney Coast Upwelling KEF and adjacent waters off South Australia and Victoria, and the Perth Canyon KEF and surrounding waters in Western Australia. Pygmy blue whales typically forage in the Otway region between January and April and have also been recorded feeding in Bass Strait and off the west coast of Tasmania (DoE, 2015b). Acoustic studies indicate that pygmy blue whales predominantly occur west of Bass Strait, with detections off Portland, Victoria, closely linked to Bonney Coast upwelling events from late summer to autumn (February–April) (McCauley et al., 2018). Both pygmy and Antarctic blue whale call types have been recorded in central Bass Strait, sometimes simultaneously, with two call types more commonly detected across years (McCauley et al., 2018). Studies have documented the diving behaviour of blue whales while foraging at depth. Gill & Morris (2003) observed Blue Whales in the Otway region diving steeply for 1-4 minutes before resurfacing. More recently, the tagging of a PBW in the Perth Canyon (Owen et al., 2016) recorded an impressive 1,677 dives over a 7.6 day period. Dive times and behaviours observed were:

- Feeding - mean of 7.6 minutes, maximum of 17.5 minutes.
- Migratory – mean of 5.2 minutes, maximum of 26.7 minutes.
- Exploratory – mean of 8.6 minutes, maximum of 22.05 minutes.

McCauley et al. (2018) suggests that acoustic detection of PBWs indicate they predominantly occur west of Bass Strait, the detection of PBWs off Portland Victoria, indicate that their presence could be seasonally attributed to upwelling indicators in the Bonney coast upwelling (~600 km from the Operational Area) in late summer to autumn (February-April). Tagging studies of PBW in the Bonney upwelling (Möller et al., 2015) revealed that while these whales primarily engaged in shallow, short dives consistent with area-restricted searching (likely foraging), they exhibited deeper dives at night. These dives were mostly square-shaped, reaching a maximum depth of 492 m (mean 59.5 m) and a maximum duration of 112 minutes (mean 6.1 minutes). Despite the maximum recorded dive time, the average dive duration of just over 6 minutes suggests that typical dives are likely less than 30 minutes. Although the EMBA does not overlap with known significant foraging areas it does overlap with foraging grounds within the Bass Strait and off the Tasmanian coast (Error! Reference source not found.).

Similar to other baleen whales the Blue Whale migrates between (low-latitude) breeding grounds in the winter to (high-latitude) foraging grounds in the summer. PBW undertake three distinct migratory phases around Australia. The "southbound migration", occurring predominantly between October and December (occasionally extending into January), during which whales travel from Indonesian waters to the Western Australian coast. This is followed by the "southern Australian stage", spanning January to June, where whales disperse across southern Australian waters. Finally, the "northbound migration" takes place between April and August, as whales return to Indonesian waters.

Acoustic monitoring programs have detected calls from both Antarctic and pygmy blue whales in the South Australian region. Antarctic blue whales are recorded along the southern Australian coastline but are considered rare in the Otway Basin (Gavrilov, 2012; McCauley et al., 2018). Pygmy and Antarctic blue whales were acoustically detected by Origin Energy between February and October 2011 east of the Thylacine-A wellhead platform. Recent acoustic studies indicate an increase in blue whale abundance off Portland, Victoria, with Antarctic blue whale calls recorded south of Portland from 2009 to 2016. Peak chorus levels

occurred between late February and late June, with increases recorded across the years (McCauley et al., 2018).

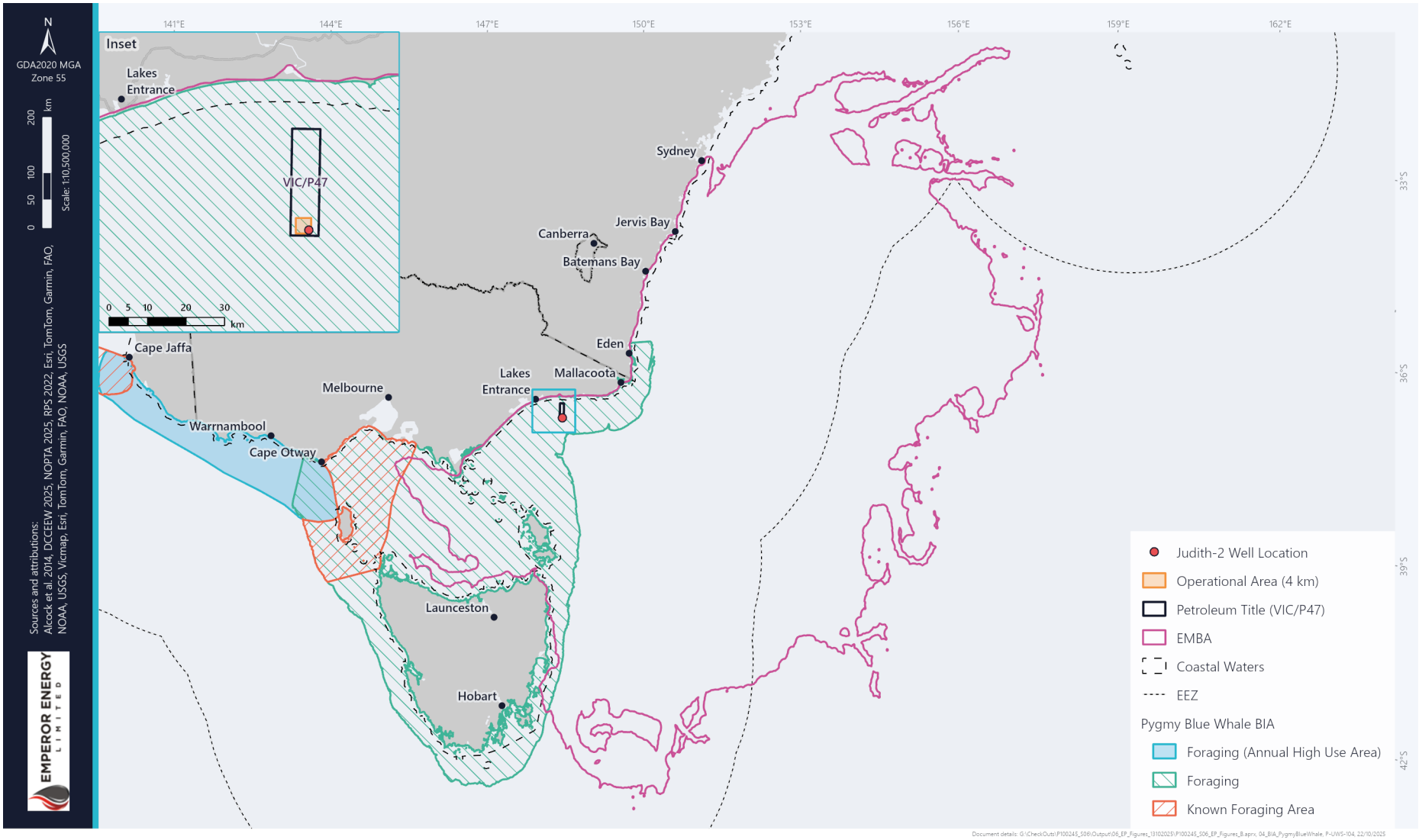


Figure 4-35: Pygmy Blue Whale Biologically Important Areas within the EMBA

Pygmy blue whales undertake three migratory stages around Australia. The southbound migration occurs from October to December, with whales moving from Indonesian waters to the Western Australian coast. The southern Australian stage occurs between January and June, during which whales spread across southern Australian waters to forage. The northbound migration occurs between April and August as whales return to Indonesian waters. Presence at Portland is strongly associated with prey availability and the Bonney Coast upwelling (McCauley et al., 2018). Passive acoustic monitoring between 2000 and 2017 captured variations in distribution and population parameters for both blue whale subspecies. At Portland, recordings from 2009 to early 2017 show variability in arrival timing, with pygmy blue whales present from November to mid-June in some years, although arrivals occurred later in other years. Acoustic monitoring east of the Thylacine platform in 2011 detected pygmy blue whales from February to early June, with peak abundance between March and mid-May.

The strength and persistence of the Bonney Coast upwelling, measured through integrated water temperature, strongly correlates with seasonal whale presence, explaining 83 percent of variability in whale calling across seasons. When corrected for population growth at 4.3% per year, the correlation increases to 90 percent (McCauley et al., 2018). Year-to-year increases in the number of pygmy blue whales calling at Portland are expected to reflect overall population growth.

Photo identification, genetic studies, and telemetry provide insight into blue whale movements and connectivity between feeding areas. Population exchange occurs between the Bonney Coast Upwelling and the Perth Canyon (Attard et al., 2018). Telemetry data from a pygmy blue whale tagged in 2014 north of the Perth Canyon recorded travel of 506.3 km in 7.6 days, illustrating the extensive distances these whales can cover in short periods (Owen et al., 2016). The whale made near-surface dives during migration, which likely reduces energy expenditure but may increase risk of ship strike during longer periods than previously assumed. Overall numbers of blue whales are expected to be low in the Gippsland region at any time of year with Gippsland being outside of predominant feeding grounds for any population of blue whales (Barlow et al., 2023). Known and likely migratory paths of the PBW are not overlapped by the EMBA.

Beach Energy Surveys (2019 – 2022)

Beach Energy conducted surveys for blue whales throughout their seabed survey and various drilling activities between 2019 and 2022, as published in Beach's Well Completions, Well Interventions, Plugging and Abandonment Activities EP (2025b). Four sightings of blue whales were recorded within 3.5 km of the Thylacine Platform in November 2019 and one sighting approximately 1 km from the Artisan 1 well location in January 2020, all of which were identified as swimming.

JASCO completed a monitoring study in relation to Beach Energy exploration drilling activities at Artisan 1 from 1 February to 6 April 2021 (McPherson et al. 2021). Songs of pygmy blue whales were detected sporadically through February and the first half of March. By the end of March, the signals were present in almost every hour of recording. This pattern of occurrence was reflected across all recording stations.

Nine aerial surveys were also undertaken from February to May 2021 during drilling activities at Artisan 1 and Geographe to monitor blue whale presence and krill surface swarms within and outside of Beach Energy's project area which found:

- There were 34 blue whale sightings consisting of 43 individuals
- The highest number of blue whale sightings was on 7 April 2021, with 19 blue whales sighted
- The first blue whale was sighted 25 February 2021 and the final blue whale was sighted 7 April 2021
- Blue whales and krill surface swarms were distributed throughout the area surveyed

Marine Fauna Observers (MFOs) were also employed from January 2021 to April 2022 to ensure compliance with whale management procedures. They collected data of blue whale presence during various MODU activities at the following intervals of distance from the MODU: 0-500 m, 501-1,500 m, 1,501-2,000 m, 2,001-3,000 m, 3,000 m. Blue whales were observed regularly, in each month except for July, August and October. A total of 324 blue whales were recorded and presence peaked in March with 102 blue whales observed.

A review of data collected between 2 February 2021 and 31 March 2022 found 127 blue whales recorded, summarised as:

- 62 whales detected between 1,501-3,000 m of the MODU
- 32 whales detected within 1,500 m of the MODU
- 33 whales first observed beyond 3 km from the MODU before moving towards it.

Of these, a total of 70 blue whales (55%) were observed as moving towards the MODU and 57 blue whales (45%) were observed as moving away from the MODU following their first detection (Table 4-8). The calculated abundance of blue whales observed was 2.7x higher in the 0-1,500 m zone (7.8 whales/km^2) than in the 1,501-3,000 m zone (2.9 whales/km^2).

Table 4-8: Blue whale observations during Beach Energy drilling operations in the Otway Basin (February 2021 – March 2022)

MODU activity	First detection – distance (m) from MODU					Total	Moving towards MODU	Moving away from MODU
	0-500	501-1,500	1,501-2,000	2,001-3,000	>3,000			
Drilling	-	7	3	8	7	25	13	12
Resupply	2	3	6	5	9	25	16	9
Drilling and Resupply	-	3	3	4	4	14	10	4
In Transit	-		1	5	2	8	4	4
At Standby	4	13	13	14	11	55	27	28
TOTAL	**6**	**26**	**26**	**36**	**33**	**127**	**70**	**57**

Observation area (km^2)	0.76	6.31	5.50	15.70
Observed whales/km^2	7.1	4.1	4.7	2.3
	0-1,500		**1,501-3,000**	
TOTAL	32		62	
Area (km^2)	7.07		21.21	
Blue whales/km^2	7.8		2.9	

If underwater noise was not displacing blue whales from the area, it would be expected that the number of blue whales per km^2 in all zones would be equivalent. Additionally, if blue whales are being displaced by underwater noise, it would be expected that the number of blue whales per km^2 would increase with increasing distance from the MODU. The apparent increased density of blue whales within 1,500 m of the MODU (Table 4-8) can be partially explained by the fact that it is more difficult to detect whales at greater distances (i.e., the probability of detection is inversely related to distance). To correct for this, surrogate detection functions were applied to the data based on Williams et al. (2016) vessel-based observation study on humpback whales based on visibility conditions and group size (Table 4-9). The Lead MFO for the Otway

drilling program advised whales were only able to be detected beyond 3 km on 25% of occasions, matching the detection function for the '4+ group size' scenario from Williams et al. (2016).

The resulting adjusted data for all scenarios show similar expected densities for the 0-1,500 m zone, with no increase in expected densities between the 0-500 m zone and 501-1,500 m zone (Table 4-10; Figure 4-36). This implies that blue whales were not being displaced within 1,500 m of the MODU. Additionally, the '4+ group size' scenario implies that there is no displacement of blue whales within 3,000 m of the MODU.

Table 4-9: Detection probabilities derived from Williams et al. (2016)

	Derived detection probabilities		
Distance	4+ group size	Excellent visibility	All data
0	1	1	1
500	1	0.98	0.94
1,000	0.97	0.59	0.5
1,500	0.78	0.31	0.25
2,000	0.57	0.18	0.15
2,500	0.4	0.12	0.09
3,000	0.29	0.08	0.07

Table 4-10: Estimated blue whale abundance and density based on Beach Energy MFO data from February 2021 – March 2022.

	First detection – distance (m) from MODU			
	0-500	501-1,500	1,501-2,000	2,001-3,000
Area (km^2) (a)	0.76	6.31	5.50	15.70
From Table 5-22				
Observed numbers (b)	6	26	26	36
Blue whales/km^2	7.1	4.1	4.7	2.3
Mean detection probability (c)				
4+ group size	1.00	0.92	0.68	0.42
Excellent visibility	0.99	0.63	0.25	0.13
All data	0.97	0.56	0.20	0.10
Expected numbers (b ÷ c)				
4+ group size	6.0	28.4	38.5	85.7
Excellent visibility	6.1	41.5	106.1	284.2
All data	6.2	46.2	130.0	348.4
Expected density (whales/km^2) (b ÷ c ÷ a)				
4+ group size	7.89	4.50	7.00	5.46
Excellent visibility	7.97	6.58	19.29	18.10
All data	8.14	7.31	23.64	22.19

*Note that the reference to Table 5-22 is Table 4-8 within this EP.

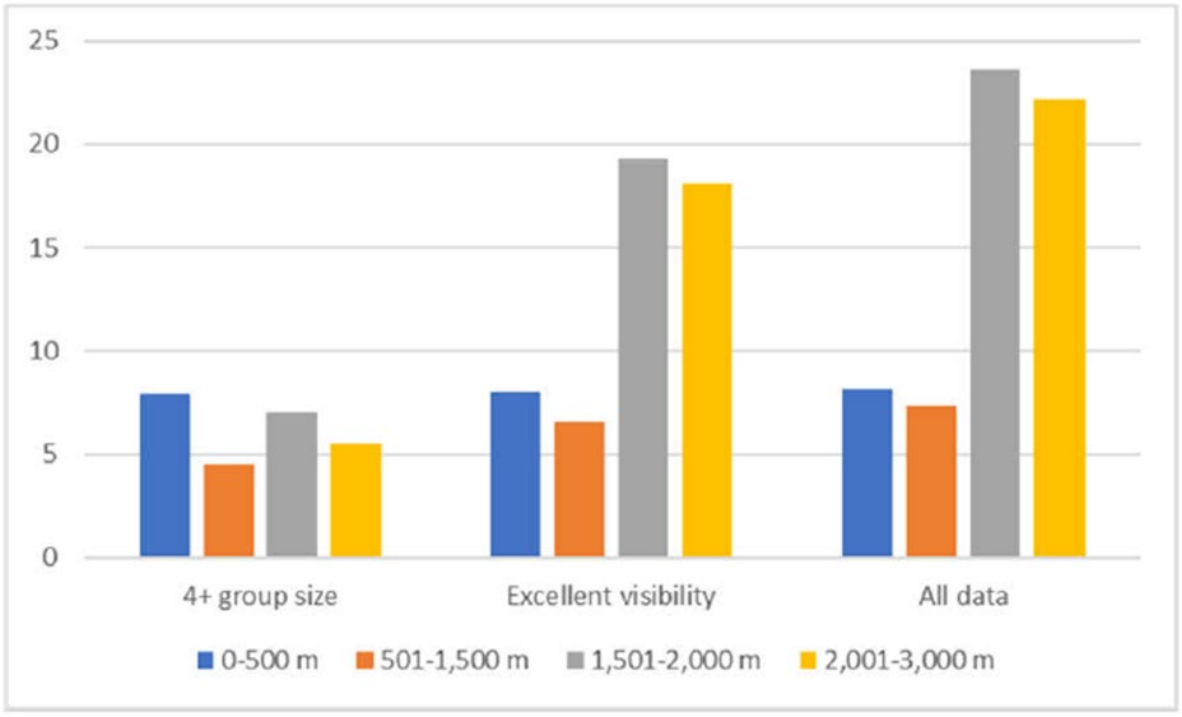


Figure 4-36: Expected density (blue whales/km^2) for each management zone.

Information from the Beach Energy Otway Basin whale survey programme has been incorporated to provide an empirical basis for understanding cetacean behavioural responses to offshore operational activities and associated underwater noise.

Observations from this programme indicate that whales, including blue whales and southern right whales, have been recorded transiting through and foraging within areas where offshore drilling and vessel operations were occurring. These observations suggest that complete avoidance of areas subject to continuous operational noise does not necessarily occur.

The Otway Basin dataset is considered relevant to the Judith-2 environment due to:

- comparable offshore temperate shelf conditions
- overlapping species assemblages, including blue and southern right whales
- similar types of continuous noise sources, including drilling rig and support vessel operations

While recognising site-specific variability and environmental differences, these observations provide a relevant empirical analogue for the Judith-2 Operational Area and are used to inform interpretation of potential behavioural responses to underwater noise.

Southern Right Whale

The Southern Right Whale (SRW) (*Eubalaena australis*) is an EPBC protected species, listed as Endangered and has been identified to exhibit biologically important behaviours within the Operational Area and EMBA (Figure 4-37). In Australia, the SRW is present seasonally between April and October and can be found within coastal waters of all state waters (DCCEEW, 2024c). They occur in Australian coastal waters along the southern coastline, from Exmouth, Western Australia to Hervey Bay, Queensland, including Tasmania (Smith et al., 2024). Southern Right Whales in Australian waters, primarily occupy shallow waters (<10 m) within 1 km of the shoreline, occurring in aggregations where they calve and nurse their young from May through October (Smith et al., 2022). The Operational Area overlaps the migratory BIA for the SRW, and the reproduction BIA (at the Victorian coast) ~33 km from the Northern boundary of the Operational Area.

Within the reproduction BIA, the SRW exhibits a high degree of long-term site fidelity with individuals returning to the same breeding site each year. Migratory BIAs are areas known, or likely to be used for movement between regions that support biologically important behaviours (e.g. foraging and reproduction).

Southern right whales have a circumpolar distribution across the Southern Hemisphere, occurring between approximately 16°S and at least 65°S. They migrate from sub-Antarctic feeding grounds to coastal waters off Australia between May and November to calve, mate, and rest (Bannister et al. 1996; DCCEEW, 2022). Along the Australian coastline, they are found from southern mainland and Tasmanian waters and generally extend as far north as Sydney on the east coast and Perth on the west coast, with occasional sightings further north at locations such as Hervey Bay and Exmouth (DSEWPaC, 2012a).

The largest established calving areas in Australia include Head of Bight in South Australia and Doubtful Island Bay and Israelite Bay in Western Australia. Smaller aggregation areas regularly used by southern right whales include Yokinup Bay in WA, Fowlers Bay in SA, and Warrnambool and Portland in Victoria. Emerging aggregation areas where whales are increasingly observed include Flinders Bay, Hassell Beach, Cheyne/Wray Bays, and Twilight Cove in WA, while sporadically occupied areas include Encounter Bay in SA (DSEWPaC 2012a). Southern right whales generally occupy shallow, sheltered bays within 2 km of the shore and in water depths less than 20 m (Charlton et al., 2019). Additional emerging areas, particularly relevant to the south-eastern population, include coastal waters off Peterborough, Port Campbell, Port Fairy, and Portland in Victoria, where small but growing numbers of non-calving whales regularly aggregate for short periods (DSEWPaC, 2012a).

Annual abundance along the Australian coast varies in part due to three-year calving cycles (Charlton 2017). Female and calf pairs typically remain within calving areas for two to three months (Burnell, 2001). Peak mating periods in Australian coastal waters occur from mid-July through August (DSEWPaC, 2012a). Pregnant females generally arrive from late May to early June, and calving and nursery grounds are occupied until October, although activity has been recorded as early as April and as late as December (Charlton et al., 2019). Stamation et al. (2020) reported that although there has been an increase in breeding females sighted in south-eastern Australia between 1985 and 2017, there is no evidence of a corresponding increase in the annual number of mother-calf pairs.

Southern right whales are highly mobile and migrate thousands of kilometres between habitats used for feeding, calving, mating, and resting. While movements along the Australian coast are reasonably well understood, information on offshore movements, non-coastal migration routes, and exact approaches to and departures from the Australian coastline remains limited (DSEWPaC, 2012a). Victorian and Tasmanian coastal waters are known to provide migratory habitat, with whales arriving along the south-eastern Australian coastline and moving westward toward established aggregation areas in South Australia, including the Head of the Great Australian Bight (Watson et al., 2021). The only established calving ground

for mother and calf pairs in south-eastern Australia is located at Logans Beach, Warrnambool, Victoria (Watson et al. 2021). Long-range photo-identification studies indicate a predominance of westward movements, suggesting seasonal westward migration along the coast (Burnell, 2001). Satellite telemetry studies have also recorded direct approaches to and departures from the coast (Mackay et al., 2015). Aerial surveys of western Bass Strait and the eastern Great Australian Bight conducted by Gill et al. (2015) detected southern right whales between May and September. No southern right whales were recorded during the Enterprise 3D seismic survey conducted by Origin in November 2014, nor during pre-survey spotter flights in late October 2014 (RPS, 2014). Aerial surveys conducted between Ceduna, SA, and Sydney, NSW, including Tasmania, in August 2013 and 2014 recorded 34 southern right whale individuals (17 breeding females) in 2013 and 39 individuals (11 breeding females) in 2014, respectively (Watson et al., 2015).

Beach Energy reported that MFOs stationed at their Otway Development Area from January 2021 to April 2022 recorded 4 southern right whales: a single individual in June and August, and two in July (Beach, 2025b).According to the National Recovery Plan for the Southern Right Whale (DCCEEW 2024), threats that may impact individuals or populations southern right whales include entanglement in fishing gear, habitat degradation from coastal and offshore developments, anthropogenic underwater noise, vessel interactions and disturbance, whaling, prey depletion and pollution as well as cumulative impacts from these threats.

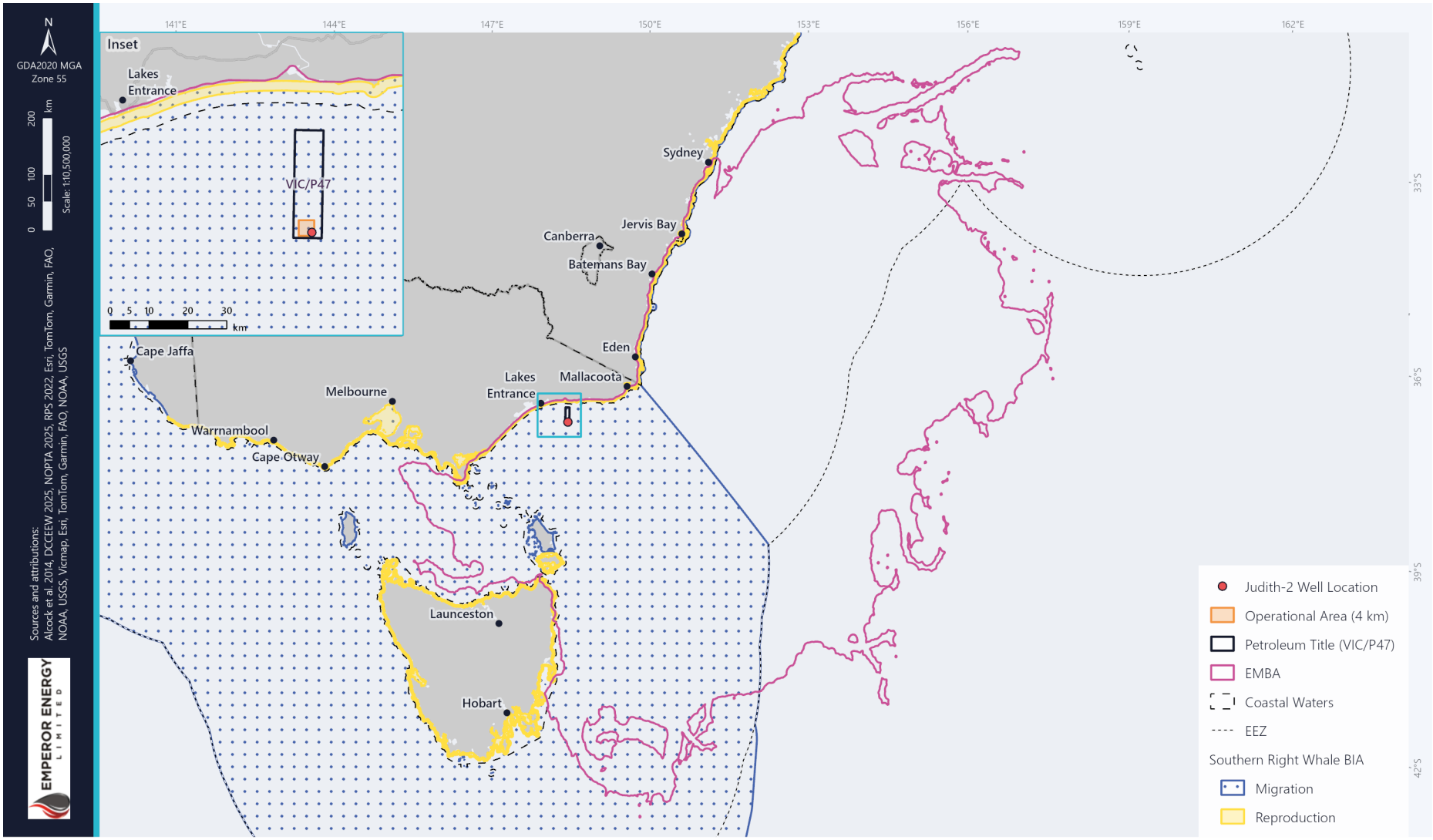


Figure 4-37: Southern Right Whale Biologically Important Areas within the EMBA

Humpback Whale

The Humpback Whale (*Megaptera novaeangliae*) is an EPBC protected species which has been identified to exhibit biologically important behaviours within the EMBA (Figure 4-38). In Australia, two distinct populations of Humpback Whales, east coast and west coast, undertake annual migrations along their respective coastlines each year. Humpback whales are present around the Australian coast in winter and spring and undertake an annual migration between summer feeding grounds in Antarctica and winter breeding and calving grounds in northern tropical waters (DAWE, 2022b). Along the south-east coast of Australia, the northern migration starts in April and May while the southern migration peaks around November and December. A discrete population has been observed to migrate along the west coast of Tasmania and through Bass Strait, and these animals may pass through the EMBA. The timing of migration varies annually with changes in water temperature, sea-ice extent, prey availability, and location of feeding grounds (DAWE, 2022b). (TSSC, 2015d).

The migratory route of the eastern Humpback Whale includes other BIAs such as resting areas (outside the EMBA) and feeding areas (within the EMBA) that are essential for the species during migration (Figure 4-39). Further, there is likely to be considerable individual site fidelity in migratory routes, and changes in usage of migratory routes may be dependent on yearly changes in primary productivity at feeding aggregations (TSSC, 2015d). The EMBA overlaps a migration BIA for the eastern Humpback Whale running along the southern NSW coastline.

Humpback whales' satellite-tagged off Australia's east coast were tracked during three austral summers (2008/2009–2010/2011), revealing that 21 of 30 tagged whales migrated south through Bass Strait during October before continuing along the east and west coasts of Tasmania to Antarctic feeding grounds. Modelling showed both search and transit behaviour, revealing new temperate feeding grounds in Bass Strait, the east coast of Tasmania and the eastern Tasman Sea (Andrews-Goff et al., 2018). The nearest BIA to the Project which is important foraging habitat for migrating humpback whales is at Twofold Bay, a resting area off the NSW coast (DAWE, 2022b). This BIA overlaps the northern extent of the EMBA.

Humpback whales primarily feed during the summer months in Antarctic waters, where krill (particularly *Euphausia superba*) constitutes a major component of their diet (Chittleborough, 1965). Feeding occurs where krill density is high, primarily in Southern Ocean waters south of 55°S (DAWE, 2022b).

The recovery of humpback whale populations following whaling has been rapid. The Australian east coast population, once hunted to near-extinction, had increased to approximately 7,090 ± 660 whales by 2004, with an annual growth rate of 10.6 ± 0.5 % between 1987 and 2004 (Noad et al., 2011). The global population exceeds 60,000 individuals and is currently listed as Least Concern on the IUCN Red List. The EMBA overlaps a migration BIA for the eastern Humpback Whale population as shown in Figure 4-38.

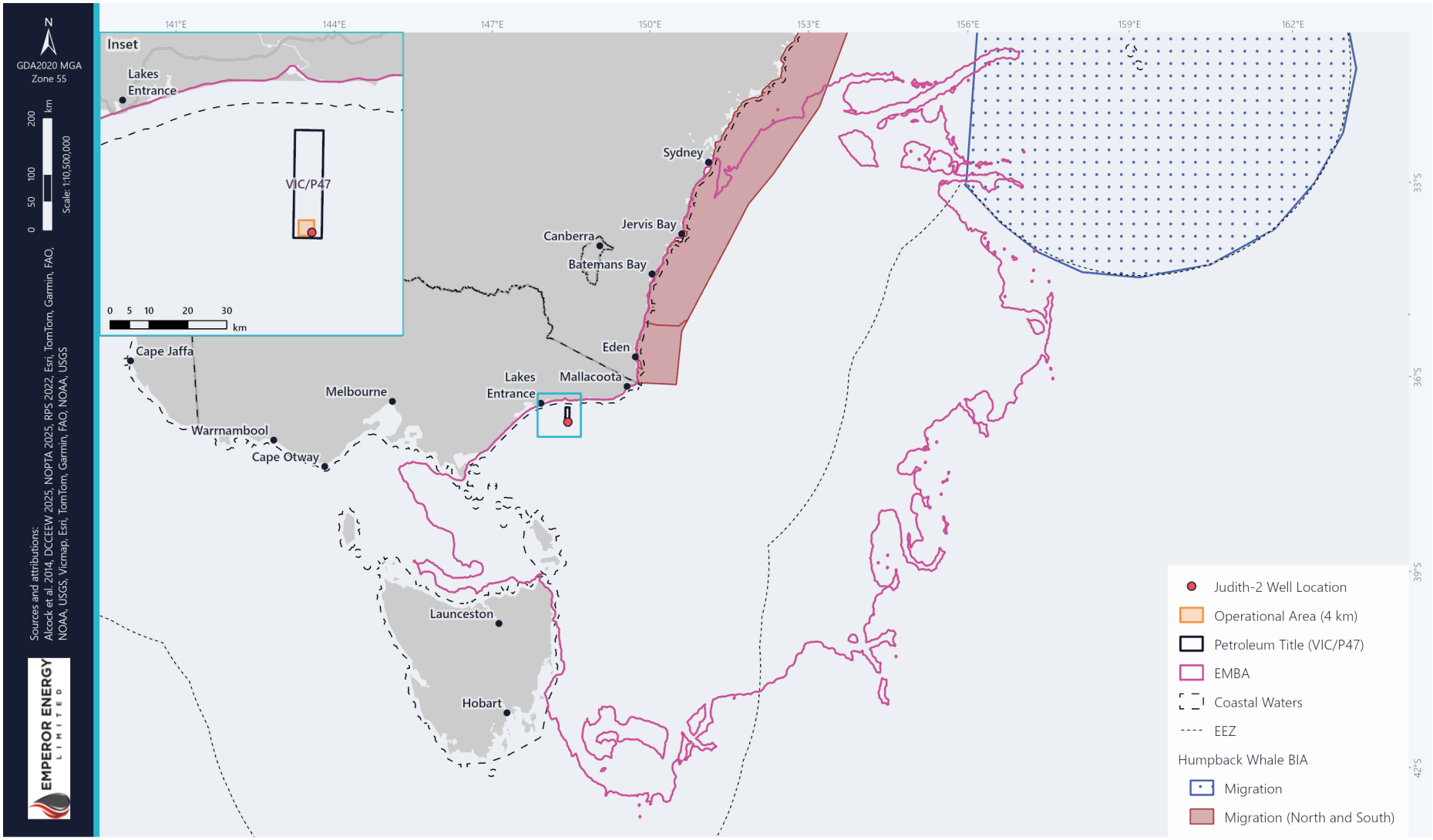


Figure 4-38: Humpback Whale Biologically Important Areas within the EMBA

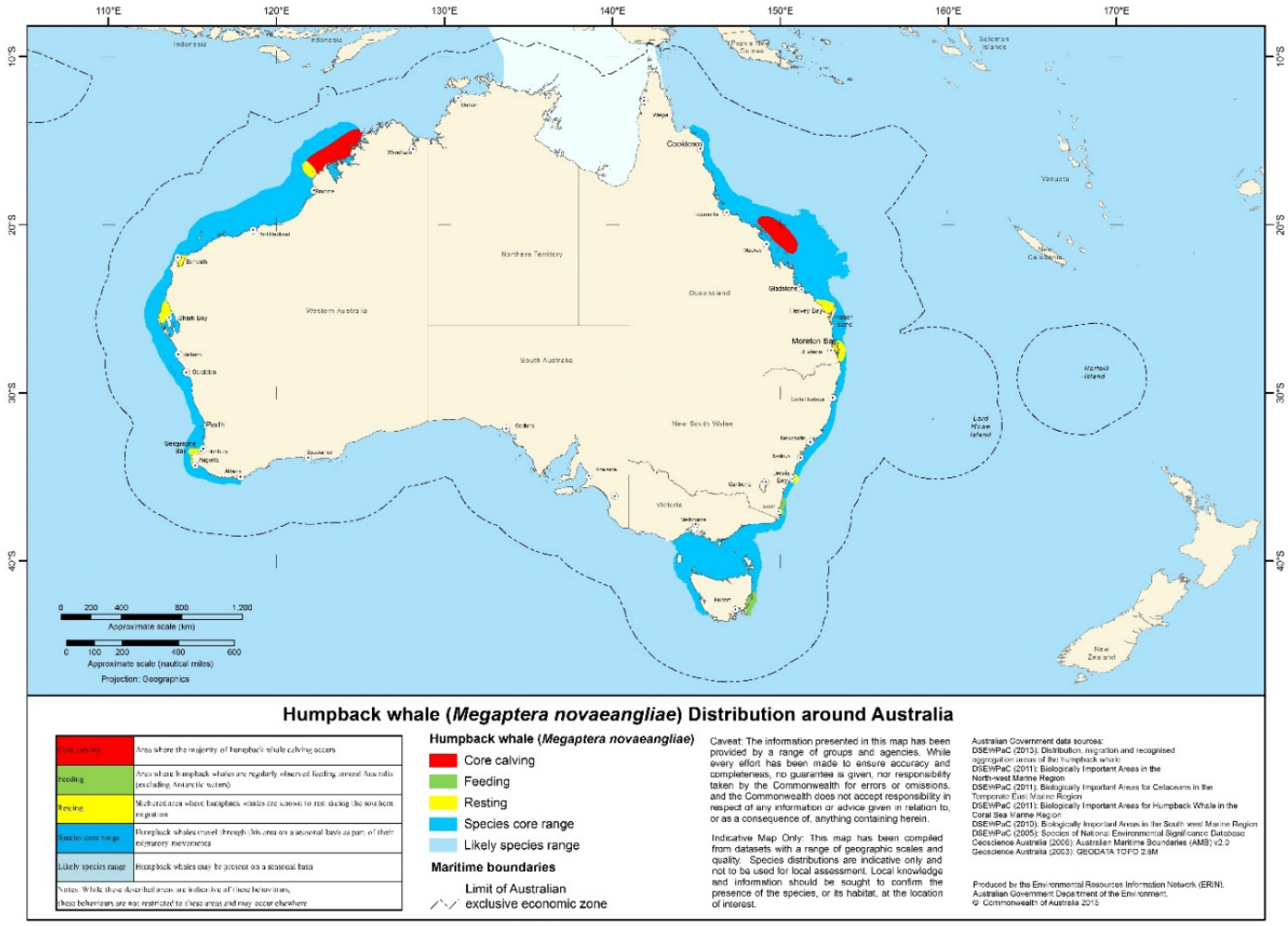


Figure 4-39: Distribution of the Humpback Whale in waters off the Australian Mainland (TSSC, 2015d)

Antarctic Minke Whales

The Antarctic Minke Whale (*Balaenoptera bonaerensis*) is an EPBC protected species, listed as migratory. While no BIAs or critical habitats were identified, the PMST identified that the Antarctic Minke Whale was likely to occur within the EMBA. The Antarctic Minke Whale has been found in all state waters except the Northern Territory and is observed to occupy temperate to Antarctic offshore and pelagic habitats (Bannister et al. 1996). These whales are typically not social and tend to swim alone or in pairs, although large feeding groups of up to 400 individuals can form in higher latitudes (DoE 2024c). In summer the Antarctic Minke Whale is typically found in pelagic waters. In winter, the species retreats to breeding grounds located in oceanic regions beyond the continental shelf break, occupying waters deeper than 600 metres (DoE 2024c). Mating occurs from June through December, and calving occurs during late May and early June in warmer waters north of the Antarctic Convergence (DoE 2024c). The species primarily feeds in the Antarctic during summer on Antarctic krill (DoE 2024c).

Bryde's Whale

The Bryde's Whale (*Balaenoptera edeni*) is an EPBC protected species, listed as migratory. While no BIAs or critical habitats were identified, the PMST identified that the Bryde's Whale may occur within the EMBA. Bryde's Whales are distributed throughout tropical and temperate Australian waters, except for the Northern Territory (Bannister J. L., 1996). There are no population estimates for Bryde's Whales, in Australia or globally, and no documented migration patterns throughout Australian waters (DoE, 2018). Bryde's Whales are considered to be opportunistic feeders, with coastal and offshore populations being distinguished by their prey preferences. The smaller coastal form typically feeds on schooling fish, such as pilchard, anchovy, sardine, mackerel, herring and others. While larger offshore form feeds on small crustaceans, such as euphausiids, copepods, pelagic red crabs and cephalopods (DoE, 2018).

False Killer Whale

The False Killer Whale (*Pseudorca crassidens*) is an EPBC protected species. While no BIAs or critical habitats were identified, the PMST identified that the False Killer Whale is likely to occur within the EMBA. False Killer Whales are widely recorded and distributed throughout Australia, in each of the coastal states. No population estimates are available for False Killer Whales in Australian waters, however, they occur in low abundance (Reeves et al. 2003). These whales show a preference for tropical to temperate oceanic waters. Considering the extensive distribution of False Killer Whales, and the large variety of habitats that they use for foraging, these species would exhibit adaptable foraging behaviours. The movement patterns of these whales in Australia are primarily inferred from stranding patterns. Stranding trends suggest a seasonal inshore movement or migration along the continental shelf, particularly along the southern and south-eastern coasts of Australia (Bannister et al. 1996; Nicol 1987).

Fin Whale

The Fin Whale (*Balaenoptera physalus)* is an EPBC protected species, listed as migratory and vulnerable. While no BIAs or critical habitats were identified, the PMST identified that foraging behaviours are likely to occur within the EMBA. Fin whales are considered a cosmopolitan species and occur from polar to tropical waters and are rarely in inshore waters. They show well-defined migratory movements between polar, temperate and tropical waters, with movements essentially north–south and little longitudinal dispersion (Bannister et al. 1996). Fin whales regularly enter polar waters and, unlike blue whales and minke whales, are rarely seen close to ice, although recent sightings have occurred near the ice edge of Antarctica.

Fin Whales are distributed across a wide range of latitudes, from polar to tropical waters, and are rarely observed in inshore environments. They follow well-defined migratory routes. Unlike Blue and Minke

Whales, Fin Whales are rarely seen close to ice, although recent sightings have occurred near the ice edge of Antarctica (TSSC, 2015b). There are stranding records of this species from most state waters, but they are still considered rare around Australia (Bannister et al. 1996).

The fin whale has been infrequently recorded between November and February during aerial surveys in the region (Gill et al., 2015). Fin whales have been sighted inshore in the proximity of the Bonney Coast Upwelling, Victoria, along the continental shelf in summer and autumn months (Gill, 2002), and are sometimes seen in the vicinity of blue whales and sei whales. Fin whales were sighted and feeding was observed between November–May (upwelling season) during aerial surveys conducted between 2002–2013 in South Australia (Gill et al., 2015). This represents one of the first documented records of these whales feeding in Australian waters, suggesting that the region may be used for opportunistic baleen whale feeding.

Fin Whales have been sighted in the proximity of the Bonney coast upwelling, Victoria, along the continental shelf in summer and autumn months (Gill et. al, 2015). Fin Whales typically lunge or skim feed, at or near the water's surface, on planktonic crustacea, fish and cephalopods (TSSC, 2015b). They have also been acoustically detected south of Portland, Victoria (Erbe et al., 2016), and Aulich et al. (2019) recorded infrequent presence of fin whales in Portland between 2009 and 2016. This suggests that the area may not be a defined migratory route; however, calls recorded in July may be from whales migrating northward towards the east coast of NSW, while calls detected in late August and September may indicate whales on their southbound migration back to Antarctic waters. These whales have also been detected acoustically south of Portland, Victoria (Erbe et al., 2016). While the area may not be a defined migratory route, calls recorded in July may be from whales migrating northward towards the east coast of NSW. Calls detected in late August and September may be indication of the presence of whales on their migration route back to Antarctic waters (Aulich et al. 2019).

The sighting of a cow and calf in the Bonney Coast Upwelling in April 2000 and the stranding of two fin whale calves in South Australia suggest that this area may be important to the species' reproduction, perhaps as a provisioning area for cows with calves (Morrice et al. 2004). The record of a Fin Whale calf during the Bonney coast upwelling in April 2000 and the stranding of two calves in South Australia suggest that this area may be important to the species' reproduction (Morrice et al. 2004). However, there are no mating or calving areas defined in Australia waters.

Pygmy Right Whale

The Pygmy Right Whale (*Caperea marginata*) is an EPBC protected species, listed as migratory and vulnerable. While no BIAs or critical habitats were identified, the PMST identified that foraging behaviours are likely to occur within the EMBA. These whales are found in temperate and sub-Antarctic oceanic and inshore waters. Distribution appears limited by the surface water temperature as they are typically found in waters with temperatures ranging from 5° to 20°C (Baker 1985), remaining north of the Antarctic Convergence. There are few confirmed sightings of Pygmy Right Whales (Reilly et al. 2008), with the largest reported group sighted (100+) just south-west of Portland in 2007 (Gill et al. 2008). Areas of coastal upwelling appear to be an important component that regulates Pygmy Right Whale distribution (DoE, 2023). Key locations include south-east Tasmania, Kangaroo Island (SA) and southern Eyre Peninsula (SA) close to upwelling habitats rich in marine life and zooplankton upon which it feeds (Bannister et al. 1996).

Sei Whale

Sei Whales (*Balaenoptera borealis*) is an EPBC protected species, listed as migratory and vulnerable. While no BIAs or critical habitats were identified, the PMST identified that foraging behaviours are likely to occur within the EMBA. These whales range from polar to tropical waters, although they are typically found more

offshore than other large whales. Sei Whales have a well-defined migratory route, that runs north to south with little longitudinal dispersion (Horwood 1987). Sei Whales migrate between Australian waters to Antarctic and subantarctic feeding areas, and their tropical and subtropical breeding areas (TSSC, 2015e). They feed between the Antarctic and subtropical convergences, on planktonic crustaceans, particularly copepods and amphipods. After the Antarctic convergency they feed on Antarctic krill (*Euphausia superba*) (TSSC, 2015e). In Australian waters, Sei Whales occur within Antarctic Australian Territory waters and Commonwealth waters. They have been infrequently recorded off Tasmania, NSW, Queensland, the Great Australian Bite, Northern Territory and Western Australia (Parker 1978; Bannister et al. 1996).

4.6.4.2. Seals

Australian Fur Seal

Australian Fur-seals (*A. pusillus*) EPBC protected species, listed as marine. While no BIAs or critical habitats were identified, the PMST identified that the Australian Fur-seals may occur within the Operational Area and breeding behaviour is known to occur within the EMBA. Australian Fur-seals are endemic to south-eastern Australian waters and they are distributed throughout waters off the coasts of South Australia, Tasmania, Victoria, and NSW. Australian Fur-seals are present in these regions all year, with breeding taking place during November and December, on offshore islands in the Bass Strait. Population numbers of this species are believed to be increasing as the population recovers from historical hunting activities (Hofmeyr et al. 2008). During the summer months, Australian Fur-seals travel between the northern Bass Strait islands and southern Tasmanian waters, however, lactating female fur-seals and some territorial males are restricted to foraging ranges within Bass Strait waters. Lactating female Australian Fur-seals forage primarily within the shallow continental shelf of the Bass Strait and the Otway at depths of between 60–80 m, within 100–200 km of the breeding colony. Male Australian Fur-seals are bound to their colonies during the breeding season, outside of this time they forage at further distances and are away for longer periods (Kirkwood et al. 2009; Hume et al. 2004). Figure 4-40 details haul out sites and colonies within the EMBA.

New Zealand Fur Seal

New Zealand Fur-seals (*A. forsteri*) EPBC protected species, listed as marine and listed as Rare under Tasmanian legislation. While no BIAs or critical habitats were identified, the PMST identified that the New Zealand Fur-seal may occur within the Operational Area and EMBA. New Zealand Fur-seals are found in the coastal waters and offshore islands of South Australia, Western Australia, Victoria, NSW and New Zealand. Population studies for the New Zealand Fur-seal in Australia carried out in 1990 estimated an increasing population of about 35,000. The species breeds in southern Australia at the Pages Islands and Kangaroo Island, which produces about 75% of the total pups in Australia which is situated outside of the EMBA. Breeding colonies are typically found in rocky habitat with jumbled boulders. Colonies are typically occupied year-round, with greater activity during breeding seasons. Pups are born from mid-November to January, with most pups born in December (Goldsworthy 2008). Figure 4-40 details the New Zealand Fur-seal breeding sites within the EMBA.

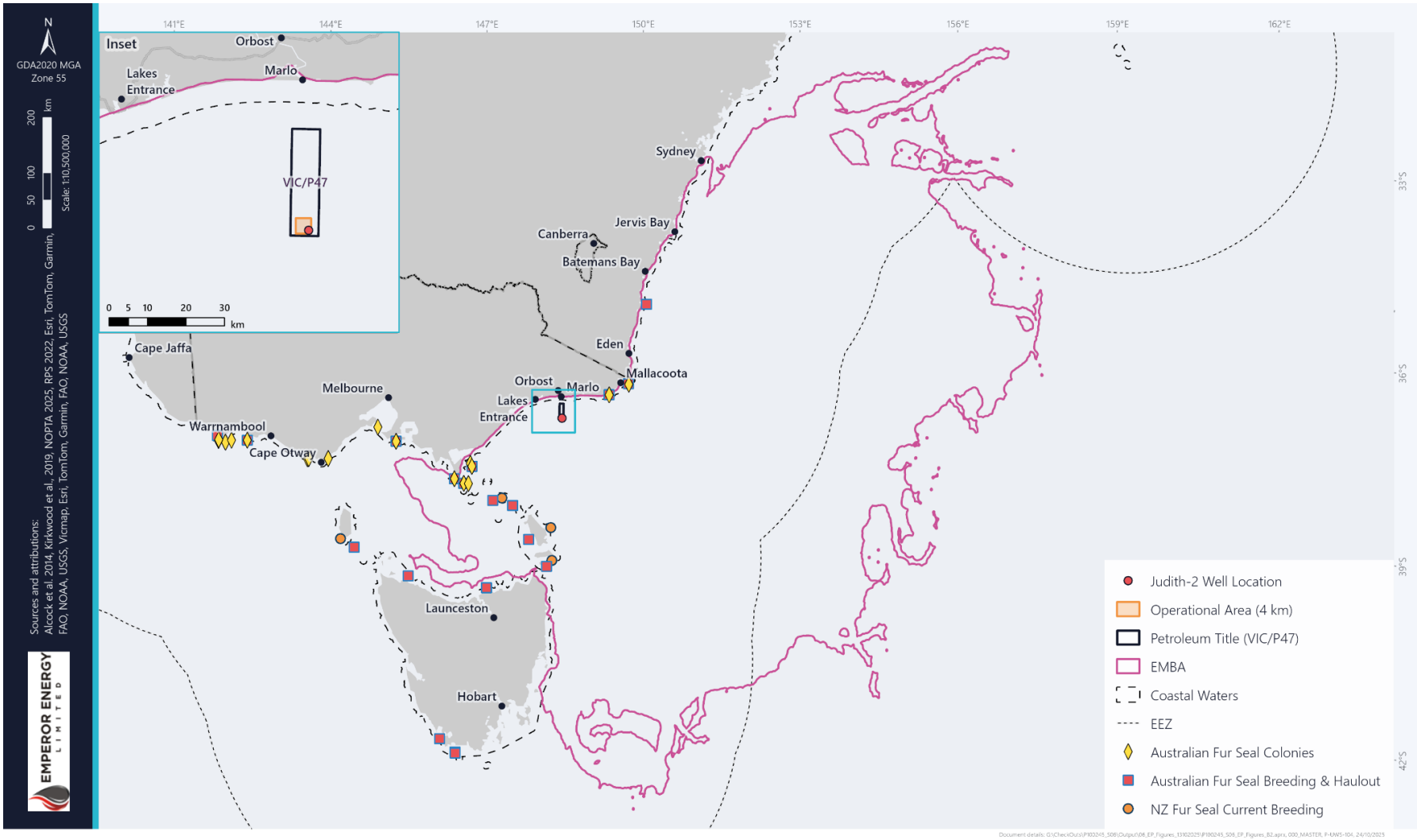


Figure 4-40: Australian and New Zealand Fur Seal Colonies and Breeding sites within the EMBA

4.6.4.3. Dolphins

Indo-Pacific Spotted Bottlenose Dolphin

The Indo-Pacific Spotted Bottlenose Dolphin is an EPBC protected species has been identified to exhibit biologically important behaviours within the EMBA. In Australia, this species is known to occur within estuarine and coastal waters of the eastern Indian Ocean, Tasman Sea, Coral Sea and the Arafura/Timor Sea (DoE, 2023). The Indo-Pacific Spotted Bottlenose Dolphin exhibits a seasonal migration that is likely associated with the movement of prey. Breeding occurs between spring and autumn months and gestation lasts for 12 months (DoE, 2023). The EMBA overlaps a portion of a breeding BIA for the species along the southern NSW coastline (Figure 4-41).

Dusky Dolphin

The Dusky Dolphin (*Lagenorhynchus obscurus*) is an EPBC protected species, listed as migratory. While no BIAs or critical habitats were identified, the PMST identified that the Dusky Dolphin is likely to occur within the EMBA. They are considered to be primarily an inshore species, although they can also be oceanic when cold currents are present (Gill P. R., 2000). This dolphin occurs across southern Australia from Western Australia to Tasmania. No key localities or critical habitats in Australian waters have been identified (Bannister J. L., 1996, DoE 2024a).

Killer Whale

The Killer Whale (*Orcinus orca*) is an EPBC protected species, listed as migratory. While no BIAs or critical habitats were identified, the PMST identified that the Killer Whale is likely to occur within the EMBA. The Killer Whale is the largest member of the dolphin family, it is thought to be the most cosmopolitan of all marine mammals. They occur more commonly in cold, deeper waters, although they often been observed along the continental slope and shelf, particularly near seal colonies (Bannister J. L., 1996). The Killer Whale is widely distributed from polar to equatorial regions and has been recorded in all Australian waters with concentrations around Tasmania. The habitat of Killer Whales includes oceanic, pelagic and neritic, in both warm and cold waters (DoE 2024b). Their breeding season is variable, and the species moves seasonally to areas of food supply (Bannister J. L., 1996) (Morrice M., 2004).

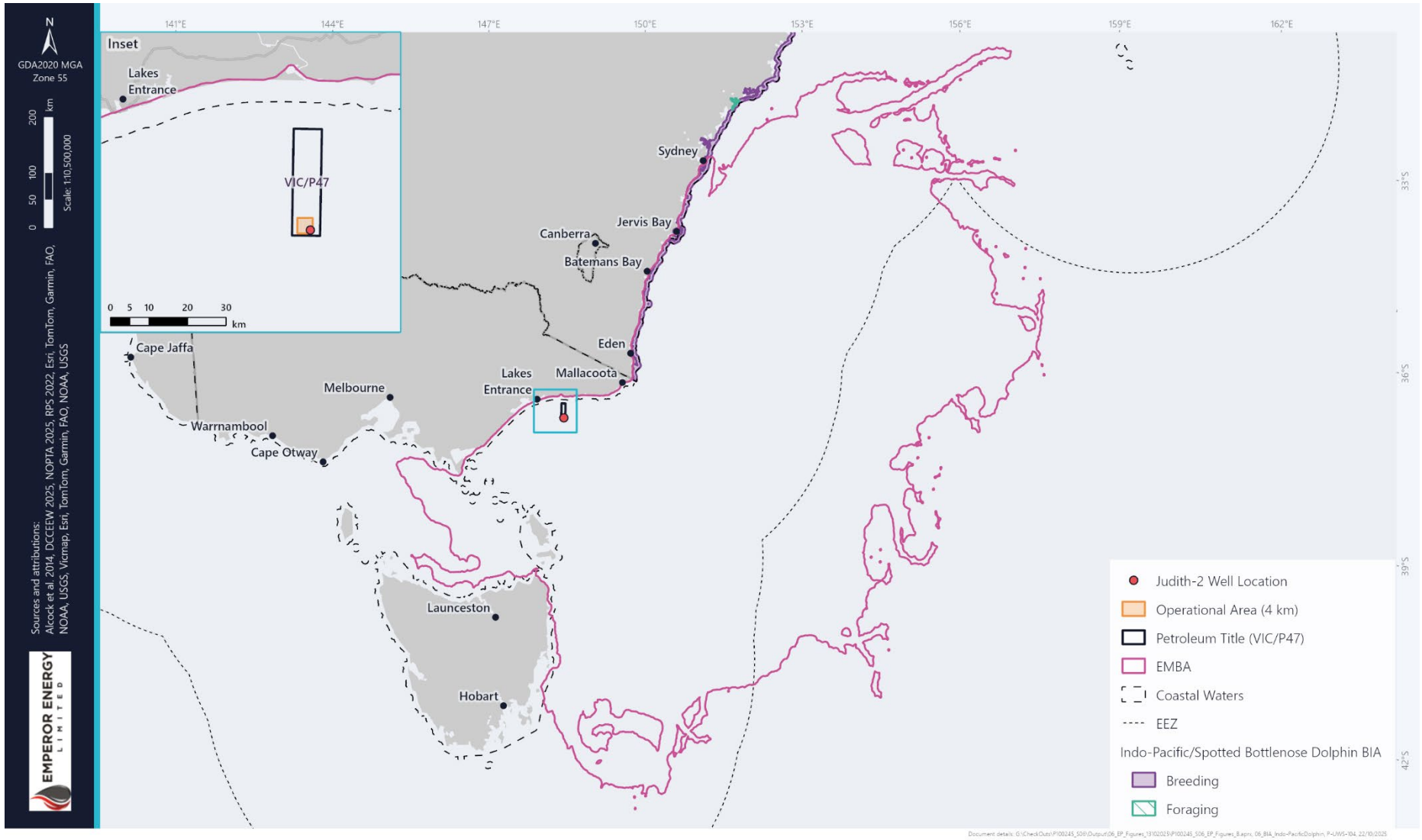


Figure 4-41: Indo Pacific Spotted Dolphin Biologically Important Areas within the EMBA

4.6.5. Marine Reptiles

Marine reptiles are a group of reptiles that have become secondarily adapted to life wholly or partially in the marine environment. Species from three marine reptile groups (marine turtles, sea snakes, saltwater crocodiles) are found in Australian waters. Some reptile species are listed as threatened and/or migratory under the EPBC Act, and these are considered a matter of national environmental significance (MNES). Species may also be protected under state and territory environmental legislation. No threatened or migratory marine reptiles have been identified to have BIAs overlapping the Operational Area or EMBA.

Five species of marine reptile have been listed in the PMST search (Table 4-11), as having likely or known presence in the Operational Area and EMBA and are discussed in this section. No marine reptile was identified as having designated BIAs within the Operational Area or EMBA.

Several species identified by the PMST to occur within the EMBA are terrestrial species and are not likely to inhabit coastlines or rely on the marine environment for breeding or foraging. These species are not considered to be credibly impacted by the activity and have been excluded from this section and impact assessment. These species are listed in APPENDIX B .

Table 4-11: Listed reptile species identified in the Operational and EMBAs

COMMON NAME	SCIENTIFIC NAME	THREATENED STATUS	MIGRATORY	MARINE	OPERATIONAL AREA	IMPULSIVE NOISE EMBA	CONTINUOUS NOISE EMBA	LIGHT EMBA	FLARING EMBA	MDO EMBA	EMBA	EPBC MANAGEMENT PLAN
Flatback Turtle	*Natator depressus*	V	✓(M)	✓	-	-	-	-	-	FKO	FKO	Recovery Plan for Marine Turtles in Australia 2017-2027
Elegant Sea snake	*Hydrophis elegans*	V	-	✓	-	-	-	-	-		MO	-
Green Turtle	*Chelonia mydas*	V	✓(M)	✓	MO	MO	MO	MO	KO	FKO	FKO	Recovery Plan for Marine Turtles in Australia 2017-2027
Hawksbill Turtle	*Eretmochelys imbricata*	V	✓(M)	✓	-	-	-	-	BLO	FKO	FKO	Recovery Plan for Marine Turtles in Australia 2017-2027
Leatherback Turtle	*Dermochelys coriacea*	E	✓(M)	✓	LO	LO	LO	LO	BLO	FKO	FKO	Approved Conservation Advice for Dermochelys coriacea (Leatherback Turtle) Recovery Plan for Marine Turtles in Australia 2017-2027 Commonwealth Listing Advice on Dermochelys coriacea
Loggerhead Turtle	*Caretta caretta*	E	✓(M)	✓	LO	LO	LO	LO	BLO	KO	FKO	Recovery Plan for Marine Turtles in Australia 2017-2027
Yellow-bellied sea snake	*Pelamis platurus*	-	-	✓	-	-	-	-	-		MO	-

Threatened Species:
V – Vulnerable
E – Endangered
CE – Critically Endangered
CD – Conservation Dependent

Type of presence:
MO - Species or species habitat that may occur within the area
LO - Species or species habitat likely to occur within area
KO - Species or species habitat known to occur within area
FMO – Foraging may occur
FLO – Foraging likely to occur
FKO - Foraging known to occur
BLO – Breeding likely to occur
BKO – Breeding known to occur

Migratory:
(M) – Migratory
(W) – Wetland

4.6.5.1. Marine Turtles

Flatback Turtle

The Flatback Turtle (*Natator depressus*) is an EPBC protected species, listed as vulnerable. Although no nesting or internesting, critical habitat, or BIAs, have been identified for the Flatback Turtle within the EMBA, foraging behaviours are known to occur within the EMBA. Flatback turtles are found in the tropical waters of northern Australia and is one of only two species of sea turtle that is not distributed globally (DoE, 2023d). All known nesting locations for this species are within Australia (DoE, 2023d). Flatback Turtles are primarily carnivorous, feeding on soft bodied carnivorous and soft-bodies invertebrates, with juveniles feeding on gastropods, molluscs, squid and siphonophores. There is limited data to indicate that their diet includes cuttlefish, hydroids, soft corals, crinoids, molluscs and jellyfish (DoE, 2023d).

Green Turtle

Green Turtles (*Chelonia mydas*) are an EPBC protected species, listed as migratory and vulnerable. Although no nesting or internesting, critical habitat, or BIAs, have been identified for the Green Turtle within the EMBA, the species may occur within the Operational area and foraging behaviour is known to occur within the EMBA. Green turtles are distributed across tropical northern Australian waters. They usually occur between the 20°C isotherms, although individuals can stray into temperate waters (Limpus 2008; CoA 2017a). The Australian population of Green turtles is approximately 70,000 individuals, predominantly found off the Northern Territory, Queensland, and Western Australian coastlines, with limited numbers in NSW, Victoria and South Australia. Green Turtles spend their first 5-10 years drifting on ocean currents. During this pelagic phase, they are often found in association with drift lines and floating rafts of sargassum. Adult Green Turtles mainly feed on seagrass and algae, although they will occasionally eat mangroves, fish-egg cases, jellyfish, and sponges; juvenile green turtles are typically more carnivorous and will also consume plankton during their pelagic stage (DoE, 2008).

Hawksbill Turtle

The Hawksbill Turtle (*Eretmochelys imbricata*) is an EPBC protected species, listed as migratory and vulnerable. Although no nesting or internesting, critical habitat, or BIAs, have been identified for the Hawksbill turtle within the EMBA, foraging behaviours are known to occur within the EMBA. Hawksbill Turtles are found in tropical, subtropical and temperate waters globally (DoE, 2017). Hawksbill turtles are omnivorous, typically feeding on sponges, hydroids, cephalopods, gastropods, cnidarians, seagrass and algae (CoA, 2017a; DoE, 2017). During their pelagic phase, juvenile Hawksbill Turtles feed on plankton (DoE, 2017). Hawksbill turtles that forage on the Great Barrier Reef migrate and neighbouring countries including Papua New Guinea, Vanuatu, and the Solomon Islands (CoA, 2017a).

Leatherback Turtle

The Leatherback Turtle (*Dermochelys coriacea*) is an EPBC protected species, listed as migratory and endangered. Although no critical habitat, or BIAs, have been identified for the Leatherback Turtle, foraging behaviours are known to occur, and breeding is likely to occur within the EMBA. Leatherback turtles are widely distributed throughout the tropical, sub-tropical and temperate waters of Australia (CoA, 2017a; Limpus, 2008). The Leatherback Turtle is most commonly reported foraging along the coastal waters of central eastern Australia, south-east Australia, southwestern WA and along the east coast and in Bass Strait (CoA, 2017a; Limpus, 2008). Leatherbacks feed on soft-bodied invertebrates, including jellyfish (Limpus, 2008). No major nesting has been recorded in Victoria or Tasmania, with isolated nesting recorded in the Northern Territory, Queensland, and northern NSW (CoA, 2017a).

Loggerhead Turtle

The Loggerhead Turtle (*Caretta caretta*) is an EPBC protected species, listed as migratory and endangered. Although no critical habitat, or BIAs, have been identified for the Loggerhead Turtle, foraging behaviours are known to occur, and breeding is likely to occur within the EMBA. Loggerhead turtles are globally distributed throughout tropical, sub-tropical and temperate waters. In Australia they typically occur in the waters of coral and rocky reefs, seagrass beds, or muddy bays throughout eastern, northern, and western Australia (DoE, 2016). The main Australian breeding areas for Loggerhead turtles are typically confined to southern Queensland and WA (Cogger et al. 1993). Loggerhead turtles are carnivorous and feed predominantly on benthic invertebrates up to 55 m offshore. They forage in all coastal states and the Northern Territory, but are uncommon in South Australia, Victoria, and Tasmania (CoA, 2017a). Although Loggerhead turtles will migrate over distances in excess of 1,000 km, they show a strong preference to their feeding and breeding areas (Limpus, 2008). While the species has a broad foraging range throughout Australian waters, nesting is known to occur on sandy beaches on the central western and eastern coasts (DoE, 2016).

4.6.1. Species Recovery Plans and Conservation Advice

Table 4-12 details recovery plans, threat abatement plans and species conservation advice which are relevant to Judith-2 Exploration Drilling EP and details the relevant threats which have been considered in both the impact and risk assessment section.

Table 4-12: Recovery Plans, Threat Abatement Plans and Species Conservation Advice relevant to Judith-2 Exploration Drilling EP

SPECIES or GROUP	RELEVANT PLAN / CONSERVATION ADVICE	OPERATIONAL AREA	EMBA	RELEVANT THREATS	RELEVANT CONSERVATION ACTION	ADDRESSED IN THE EP
All vertebrate fauna	Threat Abatement Plan for the impacts of Marine Debris on Vertebrate Wildlife of Australia's Coasts and Oceans (DoEE, 2018)	✓	✓	Ship-sourced marine debris as a risk to vertebrate marine life through entanglement or ingestion	No explicit management actions for non-fisheries related industries (note that management actions in the plan relate largely to management of fishing waste (for example 'ghost' gear), and State and Commonwealth management through regulation.	Section 5.2.2
SEABIRD AND SHOREBIRD						
Seabirds and migratory shorebirds	National Light Pollution Guidelines for Wildlife, including Marine Turtles, Seabirds and Migratory Shorebirds (DCCEEW, 2023b))	✓	✓	Light Pollution	Best practice lighting design incorporates the following design principles: Start with natural darkness and only add light for specific purposes. Use adaptive light controls to manage light timing, intensity and colour. Light only the object or area intended – keep lights close to the ground, directed and shielded to avoid light spill. Use the lowest intensity lighting appropriate for the task. Use non-reflective, dark-coloured surfaces. Use lights with reduced or filtered blue, violet and ultra-violet wavelengths.	Section 5.5
All Migratory Shorebirds	Wildlife Conservation Plan for Migratory Shorebirds (DoE, 2015a)	✓	✓	Habitat degradation and modification	No explicit relevant management actions; habitat degradation identified as a threat.	Section 5.5 Section 5.9
				Anthropogenic disturbance	Investigate the significance of cumulative impacts on migratory shorebird habitat and populations in Australia. Ensure all areas important to migratory shorebirds in Australia continue to be considered in development assessment processes (specifically for coastal developments).	Section 5.5 Section 5.9
All Seabirds	Wildlife Conservation Plan for Seabirds (CoA, 2020c)	✓	✓	Pollution (marine debris, light, water)	Enhance contingency plans to prevent and / or respond to environmental emergencies that have an impact on seabirds and their habitats.	Section 5.5 Section 5.6 Section 5.9
				Habitat loss and degradation from pollution	No explicit relevant management actions; identified as a threat.	Section 5.5 Section 5.6 Section 5.9
				Anthropogenic disturbance	Ensure all areas of important habitat for seabirds are considered in the development assessment process. Manage the effects of anthropogenic disturbance to seabird breeding and roosting areas.	Section 5.5 Section 5.6 Section 5.9
				Invasive species	Ensure seabirds are protected from the adverse effects of invasive species.	Section 5.2.2
All threatened Albatrosses and Giant Petrels	National Recovery Plan for Threatened Albatrosses and Giant Petrels (CoA, 2022)	✓	✓	Marine pollution	Where feasible, population monitoring programs also monitor, in a standardised manner, the incidence of oiled birds at the nest.	Section 5.2.1 Section 5.2.2 Section 5.9

SPECIES or GROUP	RELEVANT PLAN / CONSERVATION ADVICE	OPERATIONAL AREA	EMBA	RELEVANT THREATS	RELEVANT CONSERVATION ACTION	ADDRESSED IN THE EP
				Parasites and disease	No explicit management actions; parasites and disease recognised as a threat.	Section 5.2.2
Orange-bellied Parrot	National Recovery Plan for the Orange-bellied Parrot, *Neophema chrysogaster* (DELWP, 2016)	-	✓	Light Pollution	Assess development proposals for illuminated structures and vessels that may disrupt migratory flight paths. Investigate and monitor the risk from artificial lighting and other visual barriers along migration routes. Implement mitigation measures where risk ratings warrant action, including modifying or restricting lighting near critical habitats. Coordinate translocation strategies to reduce exposure to light pollution during sensitive life stages.	Section 5.5
FISH AND SHARK						
Australian Grayling	Conservation Advice Australian Grayling *Prototroctes maraena* (TSSC 2021)	✓	✓	Introduced species, disease and parasites	No explicit relevant management actions; introduced species, disease and pathogens identified as threats.	Section 5.2.2
Grey Nurse Shark	Recovery Plan for the Grey Nurse Shark (*Carcharias taurus*)		✓	Habitat modification	No explicit relevant management actions to Petroleum activities	Section 5.2.1 Section 5.2.2 Section 5.9
Red Handfish; Ziebell's Handfish	Australian National Recovery Plan for Three Handfish Species: spotted handfish (*Brachionichthys hirsutus*), red handfish (*Thymichthys politus*) and Ziebell's handfish (*Brachiopsilus ziebelli*) (DoEE, 2015)		✓		No explicit relevant management actions to Petroleum activities	-
Whale Shark	Approved Conservation Advice for *Rhincodon typus* (whale shark) (2015)	✓	✓	Boat strike	Minimise offshore developments and transit time of large vessels in areas close to marine features likely to correlate with Whale Shark aggregations along the northward migration route that follows the northern Western Australian coastline along the 200 m isobath (as set out in the Conservation Values Atlas, DoE, 2014).	Section 5.2.2 Section 5.4
				Habitat disruption from mineral exploration, production and transportation	Implement measures to reduce adverse impacts of habitat degradation and/or modification.	Section 5.2.1 Section 5.2.2 Section 5.4 Section 5.9
				Marine debris	No explicit relevant management actions; marine debris identified as a threat.	Section 5.2.2 Section 5.4 Section 5.9
White Shark	Recovery Plan for the White Shark (*Carcharodon carcharias*) (2013)	✓	✓	Habitat modification	No explicit relevant management actions; habitat modification identified as threats.	Section 5.2.1 Section 5.2.2 Section 5.4 Section 5.9
MARINE MAMMALS						

SPECIES or GROUP	RELEVANT PLAN / CONSERVATION ADVICE	OPERATIONAL AREA	EMBA	RELEVANT THREATS	RELEVANT CONSERVATION ACTION	ADDRESSED IN THE EP
Blue Whale	Conservation Management Plan for the Blue Whale	✓	✓	Noise interference	Assess the effect of anthropogenic noise on the blue whale; and anthropogenic noise is managed such that any blue whale continues to utilise the area without injury and is not displaced from a foraging area.	Section 4.6.4.1 Section 5.7 Section 5.8
				Habitat modification from marine debris or chemical discharge	No explicit relevant management actions; identified as a threat.	Section 5.2.1 Section 5.2.2 Section 5.9
				Vessel strike	Any vessel strikes are reported in the National Vessel Strike Database; and ensure the risk of vessel strikes on blue whales is considered when assessing actions that increase vessel traffic in areas where blue whales occur and, if required, appropriate mitigation measures are implemented.	Section 5.2.2
Fin Whale	Conservation Advice for *Balaenoptera physalus* (fin whale)			Noise interference	Evaluate risk of noise impacts to cetaceans and if required, implement appropriate mitigation measures.	Section 5.7 Section 5.8
				Pollution (persistent toxic pollutants)	No explicit relevant management actions; identified as a threat.	Section 5.2.1 Section 5.2.2 Section 5.9
				Vessel strike	Any vessel strikes are reported in the National Vessel Strike Database	Section 5.2.2
Sei Whale	Conservation Advice for *Balaenoptera borealis* (sei whale)	✓	✓	Noise interference	Evaluate risk of noise impacts to cetaceans and if required, implement appropriate mitigation measures.	Section 5.7 Section 5.8
				Habitat modification from marine debris or chemical discharge	No explicit relevant management actions; identified as a threat.	Section 5.2.1 Section 5.2.2 Section 5.9
				Pollution (persistent toxic pollutants)	No explicit relevant management actions; identified as a threat.	Section 5.2.1 Section 5.2.2 Section 5.9
				Vessel strike	Any vessel strikes are reported in the National Vessel Strike Database	Section 5.2.2
Southern Right Whale	National Recovery Plan for the Southern Right Whale (DCCEEW 2024)	✓	✓	Vessel strike	Manage, minimise and mitigate the threat of vessel strike	Section 5.2.2
				Vessel disturbance	Evaluate risk of vessel strikes and, if required, appropriate mitigation measures are implemented.	Section 5.2.2
				Anthropogenic underwater noise/noise interference	Evaluate risk of noise impacts to cetaceans and, if required, appropriate mitigation measures are implemented.	Section 5.7 Section 5.8
				Habitat degradation from coastal and offshore development	Address habitat degradation impacts from coastal and offshore marine infrastructure developments	Section 5.2.2

SPECIES or GROUP	RELEVANT PLAN / CONSERVATION ADVICE	OPERATIONAL AREA	EMBA	RELEVANT THREATS	RELEVANT CONSERVATION ACTION	ADDRESSED IN THE EP
MARINE REPTILES						
All marine turtle species	Recovery Plan for Marine Turtles in Australia, 2017-2027	✓	✓	Marine debris	No explicit relevant management actions; identified as a threat.	Section 5.2.2
				Chemical discharge	Ensure spill risk strategies and response programs adequately include management for marine turtles and their habitats, particularly in reference to 'slow to recover habitats'; and quantify the accumulation and effects of anthropogenic toxins in marine turtles, their foraging habitats and subsequent stock viability.	Section 5.2.1 Section 5.2.2 Section 5.9
				Light pollution	Artificial light within or adjacent to habitat critical to the survival of marine turtles will be managed such that marine turtles are not displaced from these habitats; and identify the cumulative impact on turtles from multiple sources of onshore and offshore light pollution.	Section 5.5
				Habitat modification	No explicit relevant management actions; identified as a threat.	Section 5.2.1 Section 5.2.2 Section 5.9
				Vessel disturbance	No explicit relevant management actions; identified as a threat.	Section 5.2.2
				Noise interference	No explicit relevant management actions; identified as a threat.	Section 5.7 Section 5.8
Leatherback Turtle	Approved Conservation Advice for Dermochelys coriacea (Leatherback Turtle)	✓	✓	As above	As above	As above

4.7.Conservation Values and Sensitivities

4.7.1. Protected Marine Areas

4.7.1.1. Australian Marine Parks

Australian Marine Parks (AMPs) are managed by the Commonwealth Government and have been established to conserve marine habitats and the species that live within and rely on these habitats. There are 62 Australian Marine Parks (AMP) located around Australia. No AMPs are located within the Operational Area, however, there are seven AMPs identified within the EMBA which are detailed in Table 4-13 and displayed in Figure 4-42.

Table 4-13: Australian Marine Parks intersected by the EMBA

AMP	MARINE REGION	ZONE	KEY VALUES	DISTANCE TO OPERATIONAL AREA
Beagle	South east	Multiple Use zone (VI) National Park Zone (IUCN Zone II)	Protects 2,928 km^2 Waters in the park are quite shallow (50-70 m) and support many rocky reef habitats. The AMP is an important foraging area for seabirds that breed on the Bass Strait islands The park was once dry land which made up part of the land bridge connecting Tasmania to mainland Australia. First Nations people lived on this land and have a strong connection to it despite the sea level rise There are two known shipwrecks located within the AMP: *SS Cambridge* (1940) and the *Eliza Davies* (1924) The shelf rocky reefs and hard substrate KEF includes mesophotic reefs between the Kent Group and Hogan Island Group within this AMP	160 km southwest
Flinders	South east	National Park (II) Multiple Use zone (VI) Habitat Protection Zone (IUCN IV)	Protects 27,043 km^2 The park spans from the coastal waters off Tasmanians offshore islands out into the deep sea. Seafloor features located within the park include a steep slope, canyons, rocky outcrops and a large seamount The seafloor of the western area of the park was part of the submerged land bridge, a culturally significant area for First Nations people The AMP is an important foraging location for species such as orcas, the white shark and a variety of albatross and petrel species	244 km south
East Gippsland	South east	Multiple Use zone (VI)	Protects 4,137 km^2	134 km east

AMP	MARINE REGION	ZONE	KEY VALUES	DISTANCE TO OPERATIONAL AREA
			The park is located off the Victorian coast and is within the Upwelling East of Eden KEF. Seafloor features located within the park include the continental shelf, canyons and escarpments The AMP is an important foraging location for oceanic seabirds such as the wandering albatross and overlapped by the Humpback Whale migration route	
Jervis	Temperate east	Habitat Protection zone (IV) Special Purpose zone (VI)	Protects 2,473 km^2 The park is located 20 km from the coast in NSW. Seafloor features located within the park include rocky reefs and a shallow continental shelf which links to the deep sea within the protected area The East Australian Current influences ecosystems within the park and created important foraging habitat for the humpback whale, grey nurse shark and a variety of seabird species The Traditional Custodians of the Jervis Bay region are the Koori people of the Wreck Bay Aboriginal Community who have relied on the resources of the coast and ocean for centuries There is one known shipwreck located within the AMP: *HMAS Tattoo* (1939)	376 km northeast
Freycinet	South east	National Park (II) Habitat Protection zone (IV) Recreational Use zone (IV) Multiple Use Zone (IUCN VI)	Protects 57,942 km^2 The park spans from the continental shelf out to the deep sea. Seafloor features located within the park include seamounts, canyons, granite reefs and deep-sea plains The AMP is an important foraging site for a variety of seabirds as well as resting habitat for Southern Right Whale during its migration	393 km south
Hunter	Temperate east	Habitat Protection zone (IV)	Protects 6,257 km^2 The park extends from shallow shelf waters out to the deep sea. Seafloor features located within the park include shelf rocky reefs and canyons	692 km southeast

AMP	MARINE REGION	ZONE	KEY VALUES	DISTANCE TO OPERATIONAL AREA
			The AMP is home to ~50 endemic fish species and is a known foraging ground for the humpback whale and grey nurse shark The Worimi people are the Traditional Custodians of the Port Stephens area and have strong cultural ties to the Sea Country within the AMP There is one known shipwreck located within the AMP: *India* (1884)	
Central Eastern	Temperate east	Habitat Protection zone (IV	Protects 70, 054 km^2 The park links the continental shelf to the Tasmantid Seamounts which are an offshore chain of undersea volcanoes. Seafloor features located within the park include deep seafloor plains, undersea canyons, slopes and pinnacles The AMP is an important foraging ground for seabirds and is within known migration pathways for a variety of whales and the grey nurse shark Currently there is limited information on the cultural significance of this AMP however Sea Country is a value for First Nations peoples cultural identify, heritage and wellbeing There are two known shipwrecks located within the AMP: *Amelia* (1816) and *Illagong* (1872)	825 km northeast

Source: Parks Australia 2023; DNP 2018; DNP, 2013; DNP, 2025

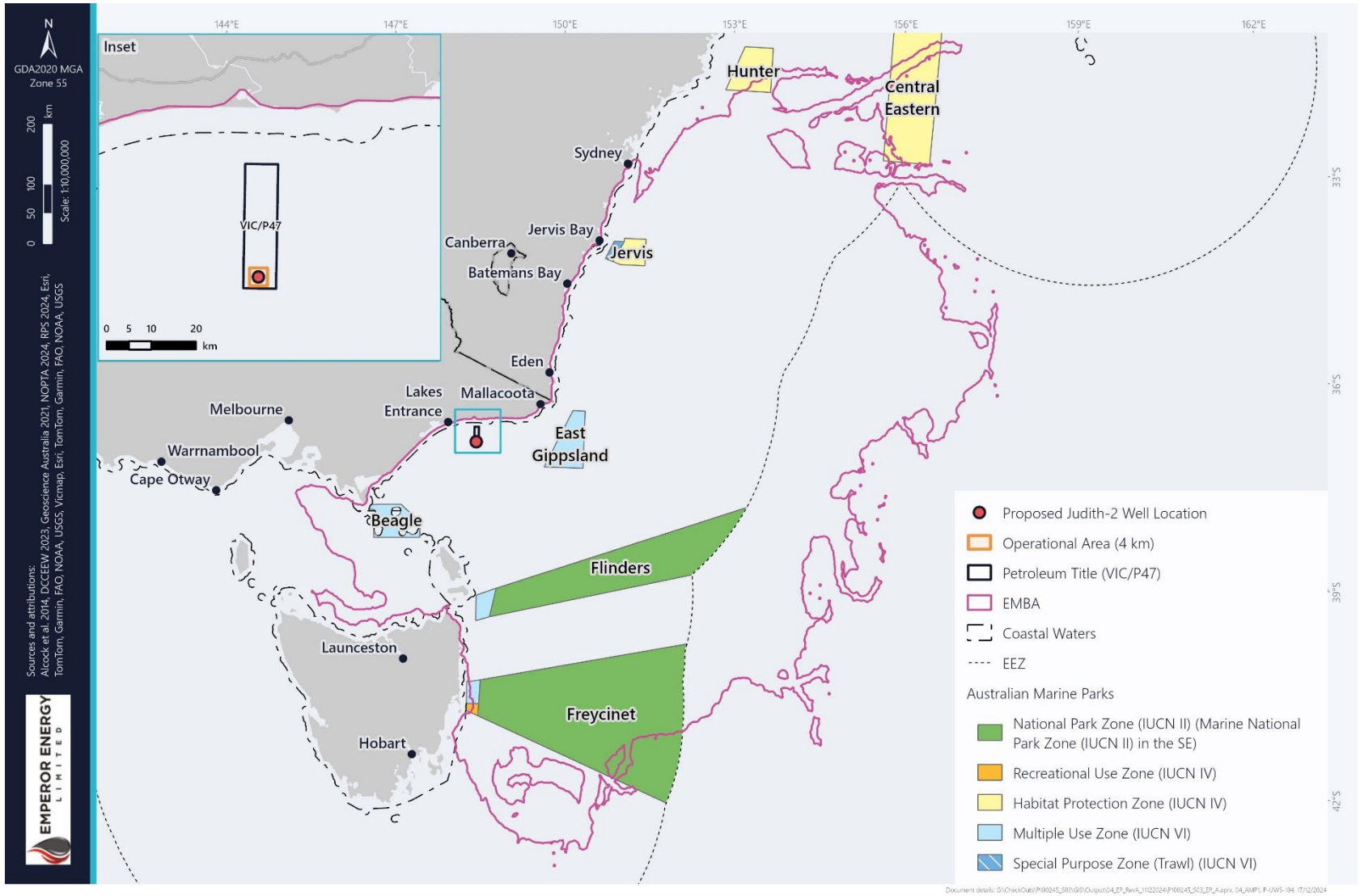


Figure 4-42: Australian Marine Parks within the EMBA

4.7.1.2. State Marine Protected Areas

In addition to Commonwealth protected marine areas, individual states have the ability to protect and manage offshore areas of biological and ecological importance through state governments, however there are no state protected marine areas identified within the Operational Area. However, there are multiple sites located within the EMBA which are detailed in Table 4-14.

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Table 4-14: State Marine Protected Areas within the EMBA

MPA	STATE	PROTECTION STATUS	KEY VALUES
North Sydney Harbour	NSW	Aquatic Reserve (IV)	• Protects ~260 ha, with habitats including rocky shores, sandy beaches, nearshore reefs, sandy seabed and harbour waters up to around 20 m deep • Seagrass habitats and nearshore reefs support kelp habitats that are used by many species, including seahorses and sea dragons
Bronte-Coogee	NSW	Aquatic Reserve (IV)	• Protects ~40 ha, extending 100 m offshore and 4,000 m across the coastline • Habitats include extensive rocky shores and nearshore reefs which support a variety of invertebrate and fish species
Cape Banks	NSW	Aquatic Reserve (IV)	• Protects ~20 ha and extends 100 m offshore from the mean low water mark • Habitats include rocky intertidal like platforms, crevices and rock pools resulting in a diversity of intertidal marine plant and animal communities
Towra Point	NSW	Aquatic Reserve (IV)	• Protects ~1,400 ha and is divided into two zone types, a refuge zone and a sanctuary zone • It is one of the largest and most diverse wetland complexes remaining in the Sydney region • Important nursery area for fish and invertebrates and provides important habitat for migratory seabirds
Boat Harbour	NSW	Aquatic Reserve (IV)	• Protects ~ 70 ha and extends 100 m offshore from the mean low water mark • Habitats include subtidal reefs interspersed with areas of sandy seabed • Important feeding ground form a number of shorebird species
Batemans	NSW	Marine Park (IV)	• Protects ~85,000 ha extending from the three-nautical-mile offshore limit of NSW waters to the mean high-water mark

MPA	STATE	PROTECTION STATUS	KEY VALUES
			• Habitats include rocky shores, offshore rocky reefs, kelp beds, seagrasses, mangroves, sponge gardens, sandy beaches, estuaries and open waters • Important breeding place for many seabirds as well a nesting location for the Little Penguin
Jervis Bay	NSW	Marine Park (IV)	• Protects ~21,500 ha and includes over 100 km of coastline and adjacent oceanic, embayment and estuarine waters • The area experiences periodic upwellings of cold, nutrient-rich waters from the nearby Continental Shelf, completely flushing it every couple week resulting in the clear waters • Habitats include deep water cliffs, exposed and sheltered sandy beaches, rock platforms, rocky reefs, soft-sediment bottoms, kelp forests, small estuaries, expansive seagrass meadows, mangrove forests and open ocean
Cape Howe	VIC	Marine National Park (II)	• Protects ~4,060 ha, with habitats including shallow and deep subtidal reefs interspersed with large areas of soft sediment • Unique due to the assortment of warm and cool water fish species • Located within a humpback whale migration route between the tropics and Antarctic waters
Point Hicks	VIC	Marine National Park (II)	• Protects ~4,000 ha, with habitats including granite subtidal reef, intertidal rock platforms and offshore sands • Is the furthest western range for many species, as the water becomes too cold to the west • A popular location for recreational divers, with two shipwrecks located within its boundaries
Beware Reef	VIC	Marine Sanctuary (II)	• Protects ~220 ha and extends ~500 m from the edge of the exposed reef • A known haul-out site for Australian and New Zealand Fur-seals.

MPA	STATE	PROTECTION STATUS	KEY VALUES
			• Forests of Bull kelp, seahorses, leafy sea dragons and the remains of a shipwreck also occur within the sanctuary
Ninety Mile Beach	VIC	Marine National Park (II)	• Protects ~2750 ha of vast sand plains with few ribbons of reef • Has one of the highest species diversity on Earth, with 860 species found within 10 m^2 • A popular location for swimming, snorkelling and diving
Nooramunga Marine and Coastal Park	VIC	National Parks Act (VI)	• Protects ~30,170 ha, with habitats including isolated granite islands, intertidal mudflats and a complex of sand barrier islands • A popular location for fishing, boating and camping
Wilsons Promontory	VIC	Marine National Park (II) National Parks Act (VI)	• Protects ~15,500 ha, with habitats including sea caves, rock ledges and kelp forests • Offshore islands support colonies of Australian and New Zealand Fur-seals and many oceanic birds • A popular location for nature viewing, snorkelling and diving
Kent Group	TAS	Marine National Park (II)	• Protects a group of islands and islets (~31,257 ha) within the Bass Strait • Convergence of three ocean currents brings a richness of nutrients and diversity of marine life • Over 20 recorded shipwrecks surround the shallow waters of the Islands
Marriott Reef	TAS	Conservation Area (VI)	• Protects ~12 ha and is composed of a small group of islands off the coast of Flinders Island which belongs to the Furneaux island group within the Bass Strait
Arthur Bay	TAS	Conservation Area (VI)	• Protects ~733 ha and is located on Flinders Island which belongs to the Furneaux island group within the Bass Strait

MPA	STATE	PROTECTION STATUS	KEY VALUES
Chappell Islands	TAS	Nature Reserve (IA)	• Protects ~200 km and is part of the Furneaux island group within the Bass Strait • Important habitat for a variety of seabirds
Moriarty Rocks	TAS	Nature Reserve (IA)	• Protects ~2km of rock and reef formations within the Bass Strait • Breeding colony for the Australian Fur seal

Source: Parks Victoria 2023; Tasmanian Parks and Wildlife Service 2022; DPI 2023

4.7.2. Threatened Ecological Communities

Ecological communities are naturally occurring groups of flora, fauna and other organisms which interact in a unique habitat. Threatened Ecological Features (TECs) are communities at the risk of extinction due to a depletion of natural composition and function across the full range. No TECs are located within the Operational Area. However, there are multiple sites located within the EMBA. Of these sites only those with coastal features which are located within the EMBA are detailed in Table 4-15 and displayed in Figure 4-43.

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Table 4-15: Threatened Ecological Communities within the EMBA

COMMUNITY	THREATENED STATUS	KEY VALUES
Giant kelp Marine Forests of South East Australia	Endangered	• Within Australia giant kelp forests are found in temperate south eastern waters on rocky reefs where conditions are cool and nutrient rich. • This TEC is defined by giant kelp that grows at depths >8 m below sea level on rocky substrate, forming a closed or semi-closed surface or sub-surface canopy. • Provides valuable habitat for a range of marine species by providing vertical habitat to the water column. • Particularly important as settlement habitat for juvenile life stages of many commercially important species.
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria	Endangered	• Located along the western and central coastlines of Victoria between the SA border and South Point of Wilsons Promontory. • This TEC is defined by the dynamic salt-wedge estuary systems that occur within the temperate climate microtidal regime (<2 m), high wave energy coastline. • The dynamic nature of the TEC results in unique physical and chemical parameters which in turn results in unique biological and ecological functions. • Taxa within the TEC may be coastal, estuarine, brackish or freshwater.
Posidonia australis Seagrass Meadows of the Manning-Hawkesbury ecoregion	Endangered	• Located within sheltered environments of permanently open estuaries along the warm temperate NSW coastline. • This TEC is defined by *Posidonia australis* which is a sub-tidal meadow-forming seagrass species that can be found in depths between <1 m to 10 m on sand and silt mud substrate. • Provides habitat, shelter and food resources for a variety of fauna species.

COMMUNITY	THREATENED STATUS	KEY VALUES
Eastern Suburbs Banksia Scrub of the Sydney region	Critically Endangered	• Located along the coastline of Sydney's eastern and south-eastern suburbs on low nutrient sands. • This TEC is defined by temperate heath and shrubland on headlands, sandplains or dunes near the coast. • Provides habitat and a range of food resource for fauna, including seeds and nectar.
Coastal swamp sclerophyll forest of New South Wales and South East Queensland	Endangered	• Located in low-lying coastal areas on mainland Australia in NSW and south QLD and islands surrounding. • This TEC is defined by forested palustrine wetlands or swamp forests in coastal valleys. • Provides feeding, breeding and roosting habitat for water-dependent, arboreal and ground dwelling species.
Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland	Endangered	• Located within the sub-tropical, sub-humid and temperate zones from Cutis Island (QLD) to near Bermagui (NSW), primarily within 30 km of the coast. • This TEC is characterised by low-lying coastal flat, floodplains, estuarine fringes and drainage lines with soils derived from unconsolidated sediments and dominated by Casuarina glauca (Swamp Oak). • Provides importance habitat for threatened mammals, reptiles. Amphibians and birds, with older trees offering hollows and crevices with ground cover supporting ground dwelling species.
Coastal Upland Swamps in the Sydney Basin Bioregion	Endangered	• Located within the Sydney Basin Bioregion, from Somersby district in the north to the Robertson district in the south, typically between 200-450 m in elevation • This TEC is characterised by periodically waterlogged acidic sold on sandstone plateaux, supporting open graminoid health, sedgeland, tall scrub and highly organic peat soils. • Provides diverse habitat for over 200 vascular plant species, with structural forms ranging from closed heath and sedgeland to tall open and closed scrub communities.
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	• Located within the subtropical and temperate climatic zones south of the South-east QLD IBRA bioregion.

COMMUNITY	THREATENED STATUS	KEY VALUES
		• This TEC is characterised by soft substrate shore of estuaries and embayment's as well as some open, low wave energy coasts. • Provides important nursery habitat for fish and prawn species with benthic invertebrates being the dominant marine residents.
River-flat Eucalypt Forest on Coastal Floodplains of Southern New South Wales and East Victoria	Critically Endangered	• Located on alluvial landforms associated with coastal floodplains in southern NSW and eastern Victoria. • This TEC is characterised by tall forest, woodland structure with canopy dominated by eucalypts. • Provides a variety of habitats suitable for fauna species exhibiting important behaviour such as foraging, nesting and roosting.
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	• Located within the South East Coastal Plain IBRA bioregion of Victoria, on poorly drained, heavy grey silty-loamy soils. • The TEC is characterised by a grassland to open grassy woodland structure with scattered trees, dominated by tussock grasses and seasonal forbs. • Provides habitat for moisture-dependant flora and fauna, with species composition influenced by seasonal water development.
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia		• Located within tropical, subtropical and warm temperate zones, typically within two km of the east coast or adjacent to large saltwater bodies such as estuaries. • This TEC is characterised by closed-canopy rainforest and vine thickets on coastal dunes, headlands and sea cliffs. • Provides habitat for over 70 threatened species and buffers against coastal erosion and salt-laden winds.

Source: DoE 2023c

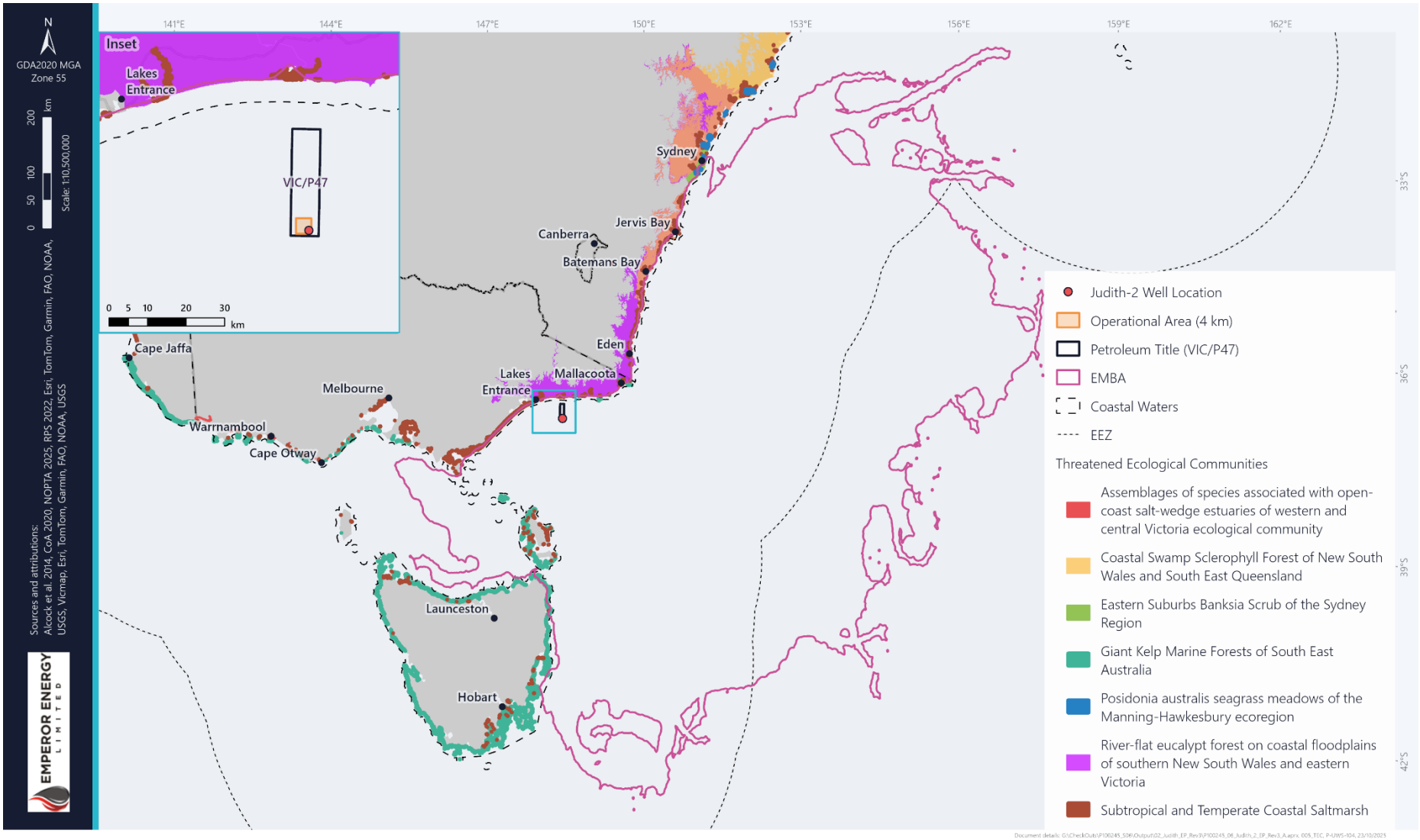


Figure 4-43: Threated Ecological Communities within the EMBA

4.7.3. Key Ecological Features

Key Ecological Features (KEFs) are elements of the marine environment, based on current scientific understanding, are considered to be of regional importance for either the region's biodiversity or ecosystem function and integrity of a Commonwealth Marine Area. There is one KEF, the Upwelling East of Eden, overlapped by the Operational Area and an additional seven located within the EMBA which are detailed in and Table 4-16 displayed in Figure 4-44.

Table 4-16: Key Ecological Features within the EMBA

KEF	Marine Region	KEY VALUES
Upwelling East of Eden	South east	• This KEF is located within the Operational Area and extends from the southern coast of NSW towards the south eastern coast of Victoria. • Considered an area of high productivity and aggregations of marine life due to the interaction between the East Australian Current and the continental shelf and headlands which result in periodic events of productivity. • The upwelling supports regionally productivity in turn supporting fisheries, top order predators, marine mammals, and seabirds. • This area is one of two feeding areas for blue whales and humpback whales, known to arrive when significant krill aggregations form.
Seamounts South and East of Tasmania	South east	• Located approximately 200 km from the southern and eastern shores of Tasmania. • A chain of seamounts rising from the abyssal plain, continental rise or plateau. • Considered an area of high productivity and aggregations of marine life due to their ability to influence currents, creating localised upwelling and turbulent mixing. • Hard substrates provide attachment points for sessile invertebrates.
Big Horseshoe Canyon	South east	• Located off the southern coast of eastern Victoria. • Is the eastern most arm of the Bass Canyon Systems and is composed of steep and rocky slopes. • Considered an area of high productivity and aggregations of marine life due to the hard substrate habitat provided for fauna species. • Sponges and other habitat forming species provide structural refuges for benthic fishes, including the commercially important species.

KEF	Marine Region	KEY VALUES
Canyons on the Eastern Continental Slope	Temperate east	• Subsea canyons are located around Australia however, the eastern continental slope feature a significant number of canyons. • Considered a unique seafloor feature with enhanced ecological functioning and integrity and biodiversity due to their ability to influence currents, creating localised upwelling and turbulent mixing. • Support a diverse range of benthic, demersal and pelagic species as well as a high degree of endemism
Shelf Rocky Reefs	Temperate east	• Located along the continental shelf, south of the Great Barrier Reef • Species distributions strongly influenced by the East Australian Current. • Considered a unique seafloor feature which is associated with ecological properties of regional significance due to the overlap of temperate and tropical species. • Hard substrate provides a range of complex benthic habitats which in turn support diverse communities
Tasman Front and Eddy Field	Temperate east	• The front is located across the southern portion of the Temperate East Marine Region, separating the Coral Sea and Tasman Sea • Formed by a current located between 27° S and 33° S that moves to the north in winter and to the south in summer. • Considered an area of high productivity and biodiversity, endemism and aggregations of marine life due to the dynamic oceanographic process which result in transient patches of enhanced productivity and in turn attract aggregations of species. • Increased productivity is important for species such as turtles and top fish predators
Tasmantid Seamount Chain		• The Tasmantid seamount chain runs north–south along ~155° E in the Temperate East Marine Region, extending into the Tasman Basin. • Features rise from depths of 1400–900 m in the south to 400–150 m in the north, with some forming islands. • Supports diverse habitats including sponge gardens and tropical coral reefs, with high biodiversity and endemism. • Important feeding and breeding grounds for species such as billfish, marine turtles and marine mammals.

Source: DoE 2023b

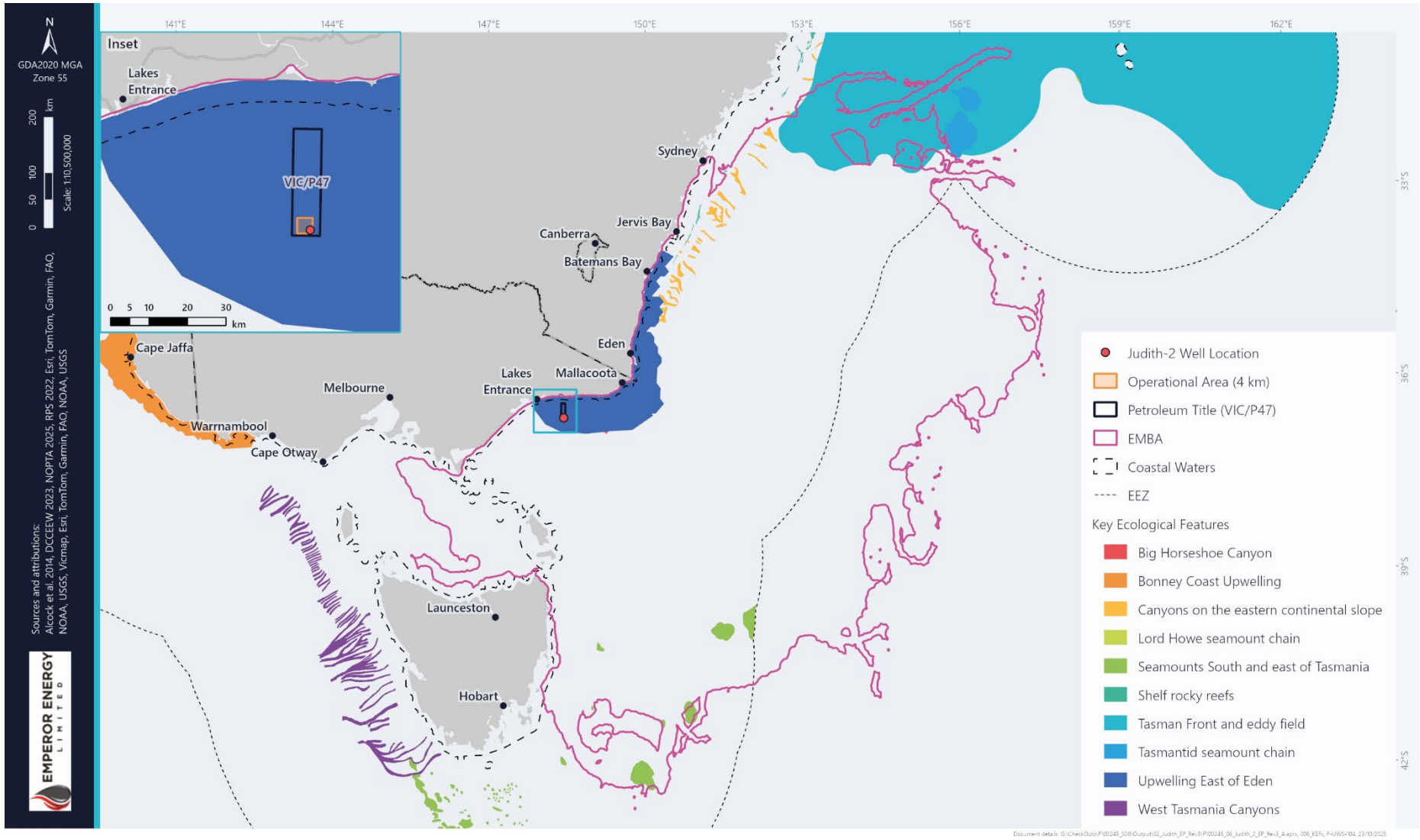


Figure 4-44: Key Ecological Features overlapping the Operational Area and within the EMBA

4.7.4. Wetlands of International Importance

Wetlands of International Importance are identified as Ramsar-listed wetlands which are representative, rare or unique or are important for conserving biological diversity. There are no Wetlands of International Importance within the Operational Area. However, there are five sites located within the EMBA which are detailed in Table 4-17 and displayed in Error! Reference source not found..

Table 4-17: Ramsar-listed wetlands within the EMBA

RAMSAR	STATE	KEY VALUES
Corner Inlet	Victoria	Protects 67,186 ha on the south-east Gippsland coast in Victoria Composed of a series of barrier islands and sand splits separates by narrow entrances to the marine environment. Coastal island vegetation is composed of mangroves, and saltmarsh Species of significance which utilised this ecosystem include the Orange-bellied Parrot, Australian Grayling and the Swift Parrot
Gippsland Lakes	Victoria	Protects 60,015 ha on the south-east coastal plain bioregion of the Gippsland coast in Victoria. Separated from the ocean by sand dunes the Gippsland Lakes form the largest navigable inland waterway in Australia, and create a distinctive regional landscape of wetlands and flat coastal plains. Brackish wetland vegetation is dominated by various saltmarsh communities. Species of significance which utilised this ecosystem include the Red Knot, Curlew Sandpiper and the Shy Albatross.
Logan Lagoon	Tasmania	Protects 2,257 ha on the south-east corner of Flinders Island in the Bass Strait, Tasmania. A low lying coastal estuarine wetland system with the water table very close to the soil surface. Dominant vegetation communities include saline aquatic herbland, saline sedgeland and rush land as well as coastal grass and scrub. Species of significance which utilised this ecosystem include the Eastern Curlew, Bar-tailed Godwit and the Little Tern.
East Coast Cape Barron Island Lagoon	Tasmania	Protects 4,473 ha on the east coast of Cape Barren Island, one of the Furneaux Group of islands in the Bass Strait, Tasmania. The site is composed of a complex of freshwater, brackish and sometimes hypersaline lagoons, wetlands and estuaries. 13 different wetland vegetation communities. Vegetation includes coastal wattle, aquatic herbland, saline sedgeland / rushland. Species of significance which utilised this ecosystem include the Hooded Plover and the White-bellied Sea Eagle.

RAMSAR	STATE	KEY VALUES
Towra Point Nature Reserve	NSW	Protects 603.7 ha on the northern coast of the Kurnell Peninsula, forming the southern and eastern shores of Botany Bay. The site is an estuarine complex composed of a mixture of spits, bars, mudflats, dunes and beaches. The site is composed of a variety of vegetation communities, including, seagrass meadows, mangroves and saltmarsh. Species of significance which utilised this ecosystem include the Eastern Curlew and the Little Tern.

Source: CoA 2023a

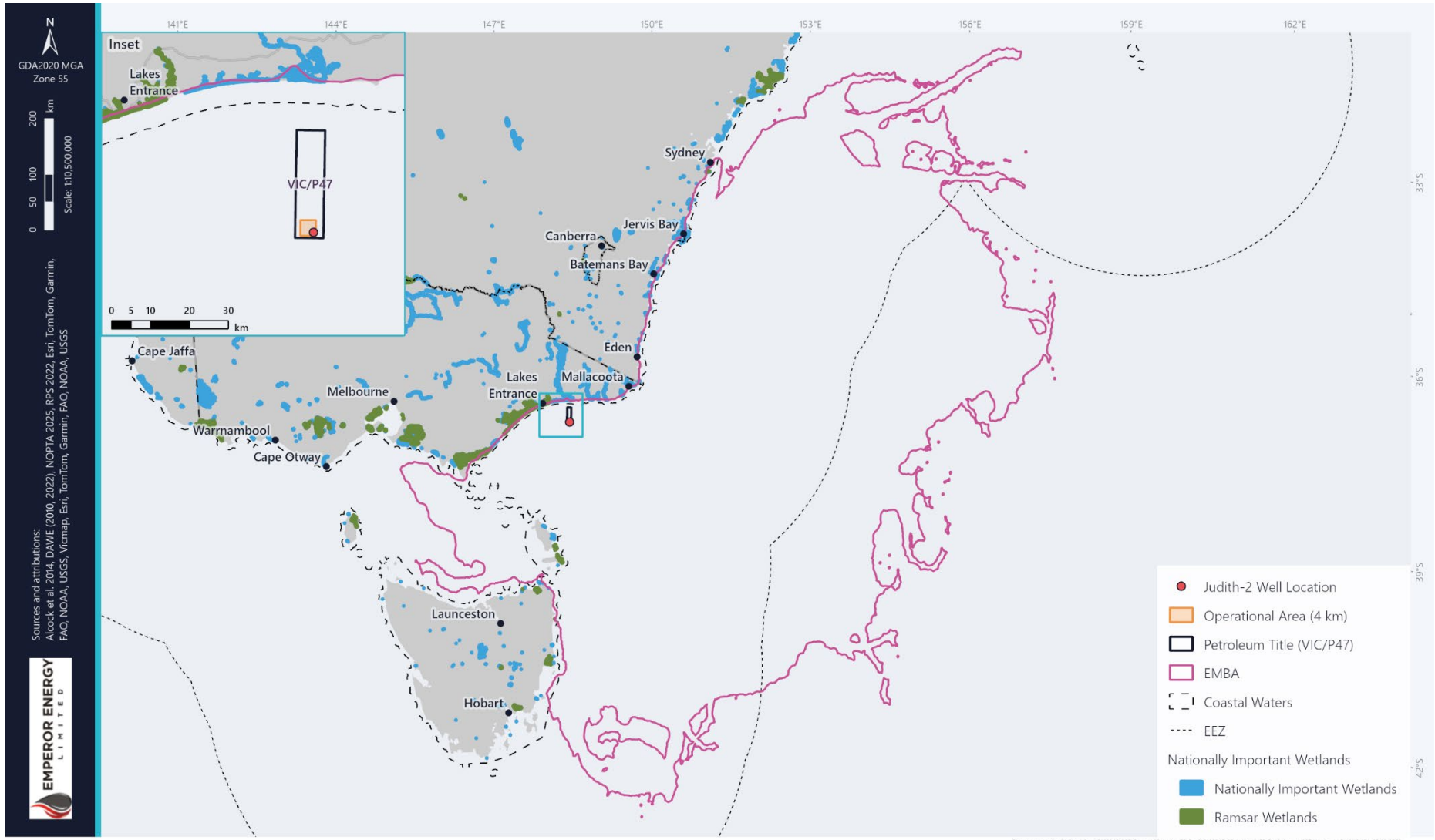


Figure 4-45: Listed Wetlands within the EMBA

4.7.4.1. Wetlands of National Importance

Wetlands of National importance are wetlands that are a good example of a wetland type, provide important habitat for native species, or are of outstanding heritage or cultural significance. There are no Wetlands of National Importance within the Operational Area. The closest are the Ewing's Marsh (Morass) and the Lower Snowy River wetlands systems, both approximately 40 km from the Operational Area. Sites located within the EMBA are displayed in Table 4-18 and Error! Reference source not found..

Table 4-18: Nationally Important Wetlands within the EMBA.

NATIONALLY IMPORTANT WETLAND	STATE	COASTAL COMPONENT
Beecroft Peninsula	NSW	✓
Benedore River	Victoria	✓
Bondi Lake	NSW	✓
Botany Wetlands	NSW	✓
Clyde River Estuary	NSW	✓
Coomaditchy Lagoon	NSW	✓
Cormorant Beach	NSW	✓
Corner Inlet	Victoria	✓
Cullendulla Creek and Embayment	NSW	✓
Durras Lake	NSW	✓
Ewing's Marsh (Morass)	Victoria	-
Fergusons Lagoon	Tasmania	✓
Five Islands Nature Reserve	NSW	✓
Flyover Lagoon 1	Tasmania	-
Flyover Lagoon 2	Tasmania	-
Hogans Lagoon	Tasmania	-
Jack Smith Lake State Game Reserve	Victoria	✓
Jervis Bay	NSW	✓
Jervis Bay Sea Cliffs	NSW	✓
Killalea Lagoon	NSW	✓
Lagoon Head	NSW	-

NATIONALLY IMPORTANT WETLAND	STATE	COASTAL COMPONENT
Lake Bunga	Victoria	✓
Lake Illawarra	NSW	✓
Lake King Wetlands	Victoria	✓
Lake Tyers	Victoria	✓
Little Thirsty Lagoon	Tasmania	-
Logan Lagoon	Tasmania	✓
Lower Snowy River Wetlands System	Victoria	✓
Mallacoota Inlet Wetlands	Victoria	✓
Merimbula Lake	NSW	✓
Meroo Lake Wetland Complex	NSW	✓
Minnamurra River Estuary	NSW	✓
Moruya River Estuary Saltmarshes	NSW	✓
Nadgee Lake and tributary wetlands	NSW	✓
Nargal Lake	NSW	-
Nelson Lagoon	NSW	✓
Pambula Estuarine Wetlands	NSW	✓
Sellars Lagoon	Tasmania	-
Shoalhaven/Crookhaven Estuary	NSW	✓
Snowy River	Victoria	✓
St Georges Basin	NSW	✓
Stans Lagoon	Tasmania	-
Swan Lagoon	NSW	✓
Sydenham Inlet Wetlands	Victoria	✓
Syndicate Lagoon	Tasmania	-
Tabourie Lake	NSW	✓
Tamboon Inlet Wetlands	Victoria	✓

NATIONALLY IMPORTANT WETLAND	STATE	COASTAL COMPONENT
Termeil Lake Wetland Complex	NSW	✓
Thompsons Lagoon	Tasmania	-
Thurra River	Victoria	✓
Towra Point Estuarine Wetlands	NSW	✓
Tuross River Estuary	NSW	✓
Twofold Bay	NSW	✓
Unnamed Wetland	Tasmania	-
Unnamed Wetland	Tasmania	-
Unnamed Wetland	Tasmania	-
Unnamed Wetland	Tasmania	✓
Wallaga Lake	NSW	✓
Wallagoot Lagoon (Wallagoot Lake)	NSW	✓

4.7.5. Heritage Places

4.7.5.1. World

No World Heritage places are overlapped by the Operational Area or the EMBA (Figure 4-46). However, there are a number of onshore sites, Sydney Opera House, Australian Convict Sites (Cockatoo Island Convict Site, Darlington Probation Station and Hyde Park Barracks) within 10 km of the EMBA.

4.7.5.2. National

No National Heritage places are located with the Operational Area. However, there are multiple sites located within the EMBA and various others within 10 km of the EMBA (Figure 4-46). Of these sites only those with coastal features which are located within the EMBA are detailed below (CoA 2023b):

- Royal National Park and Garawarra State Conservation area – contains more than one thousand species making it one of the highest concentrations of plant species in temperate Australia. The Royal National Park was the second National Park to be established in the world and is one of only four coastal national parks in NSW which protect land below the high-water mark and associated estuarine habitats.
- Kamay Botany Bay: botanical collection sites – the location where Sir Joseph Banks and Dr Daniel Solander first collect plant specimens in 1770 as part of the first landing. The collection included a large number of iconic plant species and represent the symbolic and integration of Australian flora into western science.
- Kurnell Peninsula Headland – the peninsula is known to be the first recorded site of contact in eastern Australia between First Nations people and the Europeans in 1770. There is strong evidence of First Nations people's occupation and value at the watering place and the landing stage.
- Bondi Beach and Surf Pavilion – significant in Australia's cultural history as the site of Australia's first recognised surf lifesaving club. Bondi Beach is now one of the most famous beaches in the world and draws thousands of visitors each year.
- North Head Sydney – played an important role in the cultural and military of NSW as the northern expression of the seaward entrance to Sydney Harbour. There is further association of North Head with the establishment of a Quarantine Station which was essential in Australia's development as an island-nation.

4.7.5.3. Commonwealth

Commonwealth Heritage Listed Places include Indigenous, historic and natural heritage places owned or controlled by the Australian Government. No Commonwealth Heritage places are located with the Operational Area. However, there are multiple sites located within the EMBA and various others within 10 km of the EMBA (Figure 4-46). Of these sites only those with coastal features which are located within the EMBA are detailed below (CoA 2023b):

- Malabar Headland – contains two remanent bushland sections of significance (coastal and western) which support over seven distinct plant communities. The Headland contains rare coastal communities which grow on Pleistocene sand deposits and includes the Eastern Suburbs Banksia Scrub TEC.
- Beecroft Peninsula – contains the best example of a Permian cliffed coast in the state which supports a high diversity of vegetation communities such as mangroves, saltmarshes, swamp and rainforest.
- Crocodile Head Area – an indigenous listing which encompasses approximately 20 ha and is located on Beecroft Peninsular near Crocodile Head. Limited information is available on the listing.

- Barracks Group HMAS Watson – comprised of four historic buildings (Cliff house, Buildings 33 A and B, a barracks mess, and building 25). Originally built from 1876 to 1903, serving as an officer's mess, enlisted barracks and later a naval accommodation and recreational facilities. The buildings are the remnants of the early defence activities as the site, which later became the Navy's premier maritime warfare training establishment.
- Cape St George Lighthouse Ruins and Curtilage – significant for their role in the early development of coastal navigation aids and their link to the 1856 Lighthouse Commission, which established Australia's first inter-colonial agreement on lighthouse provision.
- Macquarie Island Lighthouse and Surrounding Wall – reflects Australia's historical reliance on sea navigation, with well-preserved Victorian-era structures, remnants of the original 1816 lighthouse, and archaeological features that span over 170 years of settlement. The site also holds cultural and architectural value through its association with early colonial figures and evolving lighthouse technologies.
- Point Perpendicular Lightstation – comprises of a group of intact Victorian lighthouse buildings, which were constructed using pre-cast concrete blocks. Reflects the evolution of coastal navigational aids in New South Wales as well as the architectural legacy of Public Works Department designer Charles Assinder Harding.
- Swan Island Lighthouse - represents one of Tasmania's earliest lighthouse constructions, built with convict labour and featuring a distinctive rendered rubble base with freestone capital, while its remote coastal setting and intact 1930s buildings reflect its long operational history and continued development as part of Bass Strait's mid-nineteenth century navigation network.
- Swan Island Lighthouse - represents one of Tasmania's earliest lighthouse constructions, built with convict labour and featuring a distinctive rendered rubble base with freestone capital, while its remote coastal setting and intact 1930s buildings reflect its long operational history and continued development as part of Bass Strait's mid-nineteenth century navigation network.
- Wilsons Promontory Lighthouse - features a rock-faced granite tower and a cohesive group of historic buildings arranged in a linear formation, reflecting nineteenth-century lighthouse design and isolated coastal living, with the site's remote location and rugged landscape reinforcing its role as a southernmost navigational aid on the Australian mainland.
- Jervis Bay Territory - supports a high number of indigenous plant species as well as well-preserved vegetation communities of mangrove, saltmarsh and rainforest. The territory has strong cultural ties to the Koori people of Wreck Bay which is evident in the number of prehistoric First Nations sites and the ancestral and creation stories relating to the area.

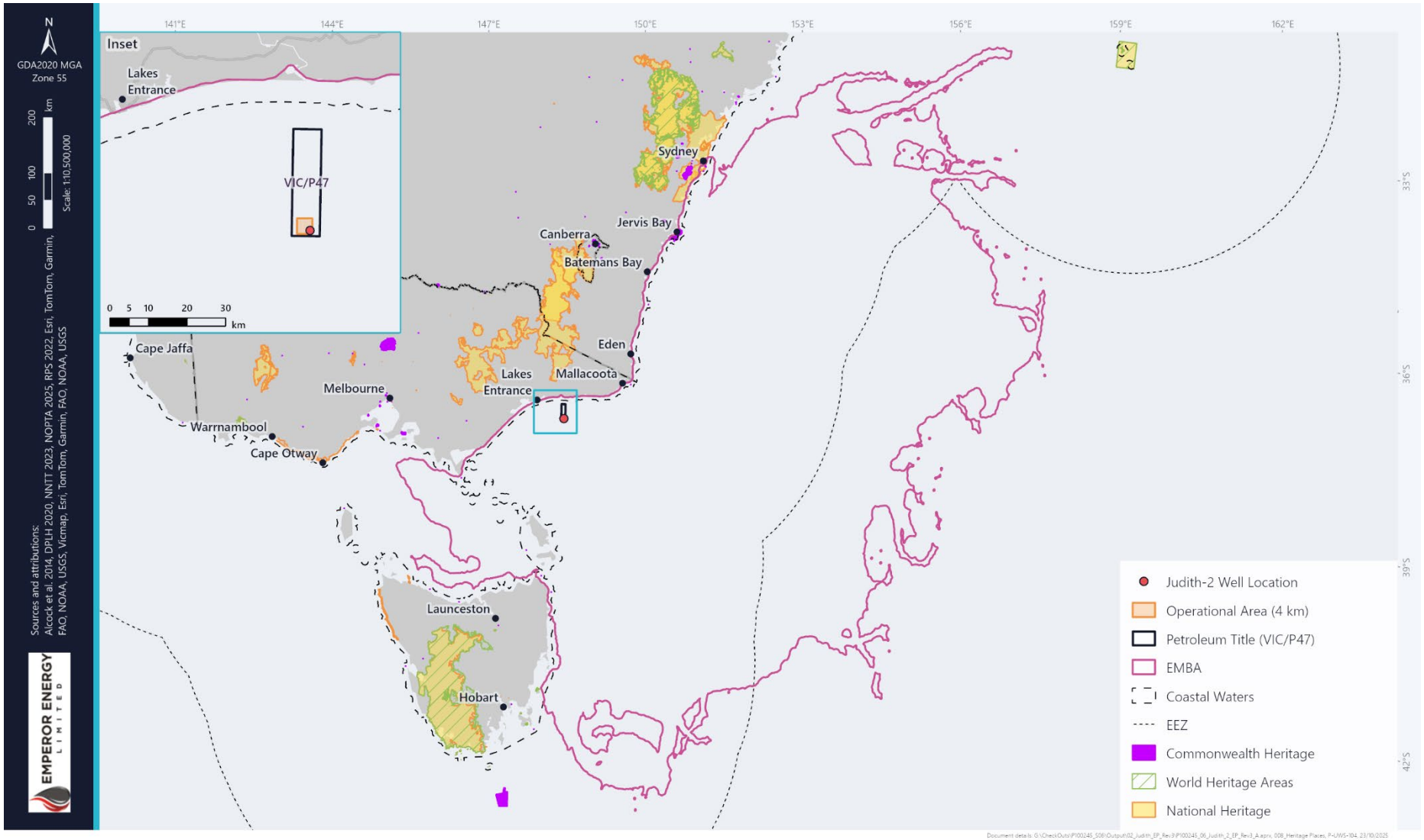


Figure 4-46: Heritage Listed Places within the EMBA

4.8.Socio-Economic Environment

4.8.1. Commonwealth-managed Commercial Fisheries

Commonwealth fisheries are managed by the Australian Fisheries Management Authority (AFMA) under the *Fisheries Management Act 1991* (Cth). AFMA jurisdiction covers the area of ocean from 3 nm from the coast out to the 200 nm limit (the Australian Fishing Zone (AFZ)).

Ten Commonwealth-managed fisheries have management areas that intersect the Operational Area and the EMBA. To identify Commonwealth-managed fisheries that could be potentially impacted by the activities under this EP, a review of fisheries data accessed from the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) and data collected by the Australian Fisheries Management Authority (AMFA) was conducted. This review identified three Commonwealth-managed fisheries with activity within the Operational Area between 2016 to 2022. An additional seven fisheries within the EMBA are described in Table 4-19. Those considered active within the Operational Area and therefore having a potential to interact with planned activities include the:

- Southern and Eastern Scalefish and Shark Fishery (SESSF) – Gillnet Hook and Trap Sector (Shark Gillnet sub-sector).
- Southern and Eastern Scalefish and Shark Fishery (SESSF) – Commonwealth Trawl Sector (Otter-board trawl sub-sector).
- Southern and Eastern Scalefish and Shark Fishery (SESSF) – Commonwealth Trawl Sector (Danish-seine sub-sector).

The Eastern Skipjack Tuna Fishery has been inactive since the 2008-2009 fishing season and is not discussed further.

Table 4-19: Description of Commonwealth-managed Fisheries with management areas overlapping Operational Area and EMBA

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
Commonwealth Managed Fisheries[1]							
Bass Strait Central Zone Scallop Fishery	Commercial scallop (*Pecten fumatus*)	Operates in the Bass Strait above Tasmania and extends from the Victoria / New South Wales border, around southern Australia to the Victoria / South Australia border.	Method: Towed dredges. Licences: 37 permits for 2024 and 35 in 2023 season and individual transferrable quotas. Season: 6 July to 31 December.	There were eight active vessels in the 2024 fishing season and nine active vessels in the fishery in the 2023 season with fishing concentrated on beds in both the eastern and western Bass Strait.	✓	✓	✗ Although there is potential for overlap of fishing activity within the Operational Area, reported fishing intensity between 2016-2020 has been concentrated on the eastern sides of King Island and Flinders Island (Figure 4-47).
Eastern Tuna and Billfish Fishery	Striped marlin (*Kajikia audax*), south-west Pacific Swordfish (*Xiphias gladius*), south-west Pacific Albacore (*Thunnus alalunga*), south Pacific Bigeye tuna (*Thunnus obesus*), western and central Pacific Yellowfin tuna (*Thunnus albacares*), western and central Pacific	Operates in the Exclusive Economic Zone and adjacent high seas, from Cape York to the Victoria – South Australia border, including waters around Tasmania and the high seas of the Pacific Ocean.	Method: mostly longlines but minor line permitted. Licences: 79 longline boat permits and 83 minor line boat permits in 2024. In 2023 there were 79 longline boat permits and 83 minor line permits. Season: 12 months beginning 1 January.	There were 46 active vessels in the 2024 fishing season and 46 active vessels in the 2023 season.	✓	✓	✗ No overlap of fishing activity is expected within the Operational Area as effort is concentrated along the eastern states. However, the EMBA overlaps an area of low to high fishing intensity recorded between 2017-2022 (Figure 4-48).
Small Pelagic Fishery	Australian sardine (*Sardinops sagax*) Blue mackerel, east (*Scomber australasicus*) Blue mackerel, west (*Scomber australasicus*) Jack mackerel, east (*Trachurus declivis*) Jack mackerel, west (*Trachurus declivis*) Redbait, east (*Emmelichthys nitidus*) Redbait, west (*Emmelichthys nitidus*)	Extends from southern Queensland to southern Western Australia. The fishery has 3 subareas (east, west and sardine), each with separate stock-level total allowable catches.	Method: purse-seine and midwater trawl. Licences: 33 entities in 2022-23 season and 28 entities in 2023-24 season. Season: 12 months beginning 1 May	There were eight active vessels in the 2023-2024 season and six active vessels in the 2022-2023 season.	✓	✓	✗ No overlap of fishing activity is expected within the Operational Area as effort is concentrated along the eastern coastline of Tasmania and NSW (Figure 4-49).
SESSF – Gillnet Hook and Trap Sector	Elephantfish (*Callorhinchus milii*) Gummy shark (*Mustelus antarcticus*)	Most fishing using nets occurs in Bass Strait, while most fishing using hooks occurs off South Australia.	Method: demersal gillnet, demersal longline, and auto-longline. Licenses: 60 gillnet permits, and 13 shark hook permits during	There were 31 gillnet and 68 shark hook vessels active in the 2023-24 season and 30 gillnet and 57 shark hook vessels active in the 2022-23 season.	✓	✓	✓ Shark Gillnet sub-sector The Operational Area overlaps an area of reported low to medium fishing intensity (Figure 4-50).

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
	Sawsharks (*Pristiophorus cirratus, P. nudipinnis*) School shark (*Galeorhinus galeus*)		both the 2022-23 and the 2023-24 seasons. Season: 12 months beginning 1 May.				× Shark Hook sub-sector Although there is potential for overlap of fishing activity within the Operational Area reported fishing intensity between 2016-2020 has been concentrated around the Furneaux Island group in Tasmania (Figure 4-51).
SESSF – Commonwealth Trawl and Scalefish Hook sectors	Blue-eye trevalla (*Hyperoglyphe antarctica*) Blue warehou (*Seriolella brama*) Deepwater sharks, eastern zone (up to 18 species) Eastern school whiting (*Sillago flindersi*) Flathead (*Neoplatycephalus richardsoni* and 4 other species) Gemfish, eastern zone (*Rexea solandri*) Gulper sharks (*Centrophorus harrissoni, C. moluccensis, C. zeehaani*) Jackass morwong, eastern zone (*Nemadactylus macropterus*) John dory (*Zeus faber*) Mirror dory (*Zenopsis nebulosa*) Ocean jacket (*Nelusetta ayraud*) Ocean perch (*Helicolenus barathri, H. percoides*) Orange roughy (*Hoplostethus atlanticus*) Smooth oreodory, (*Pseudocyttus maculatus*) Other oreodories (*Allocyttus niger, Neocyttus rhomboidalis, A. verrucosus, Neocyttus spp.*)	The Commonwealth trawl sector extends south from Barrenjoey Point in northern New South Wales to east of Kangaroo Island off of South Australia. The Scalefish Hook sector extends around south-eastern Australia to the border between South Australia and Western Australia.	Method: otter-board trawl, Danish-seine, hook (dropline, demersal longline), trap (minor). Licences: 57 trawl and 37 scalefish hook fishing rights permissible in the 2022-23 season and 36 trawl and 37 scalefish hook fishing rights permissible in the 2023-24 season. Season: 12 months beginning 1 May.	There were 24 trawl, 18 Danish-seine, and 13 scalefish hook vessels active during the 2023-24 season and then 30 trawl, 18 Danish-seine, and 21 scalefish hook vessels active during the 2022-23 season.	✓	✓	✓ Commonwealth Trawl Sector The Operational Area overlaps an area of reported low to medium fishing intensity for the otter-board trawl sub-sector (Figure 4-52). The Operational Area overlaps an area of reported high fishing intensity for the danish-seine sub-sector (Figure 4-53) × Scalefish Hook Sector Although there is potential for overlap of fishing activity within the Operational Area reported fishing intensity between 2016-2020 has been concentrated off the eastern coast of Tasmania (Figure 4-54).

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
	Pink ling (*Genypterus blacodes*) Redfish (*Centroberyx affinis*) Ribaldo (*Mora moro*) Royal red prawn (*Haliporoides sibogae*) Silver trevally (*Pseudocaranx georgianus*) Silver warehou (*Seriolella punctata*)						
Southern Bluefin Tuna Fishery	Southern bluefin tuna (*Thunnus maccoyii*)	Spans the Australian Fishing Zone.	Method: purse-seine and longline. Licences: 85 permits for the 2022-23 season and 83 permits for the 2023-24 season. Season: 12 months beginning 1 December.	There were six active purse-seine vessels and 24 longline vessels active in the 2023-24 season. There were six purse-seine vessels and 22 longline vessels active in the 2022-23 season.	✓	✓	× No overlap of fishing activity is expected as effort is concentrated along the eastern states. However, the EMBA overlaps an area of low to high fishing intensity recorded between 2017-2022 (Figure 4-55).
Southern Squid Jig Fishery	Gould's squid (*Nototodarus gouldi*)	Located off New South Wales, Victoria, Tasmania and South Australia, and in a small area of oceanic waters off southern Queensland.	Method: Squid jig with high-powered lamps set to attract squid. Vessels typically operate at night in continental-shelf waters between depths of 60 m and 120 m. Licences: No detail on licences. Season: 12 months beginning 1 January.	There were 10 active vessels in the 2024 season and eight active vessels in the 2023 season.	✓	✓	× Although there is potential for overlap of fishing activity within the Operational Area reported fishing intensity between 2016-2020 has been concentrated off the eastern coast of Tasmania and south of Warrnambool (Figure 4-56)

[1] ABARES 2025 and AFMA 2022

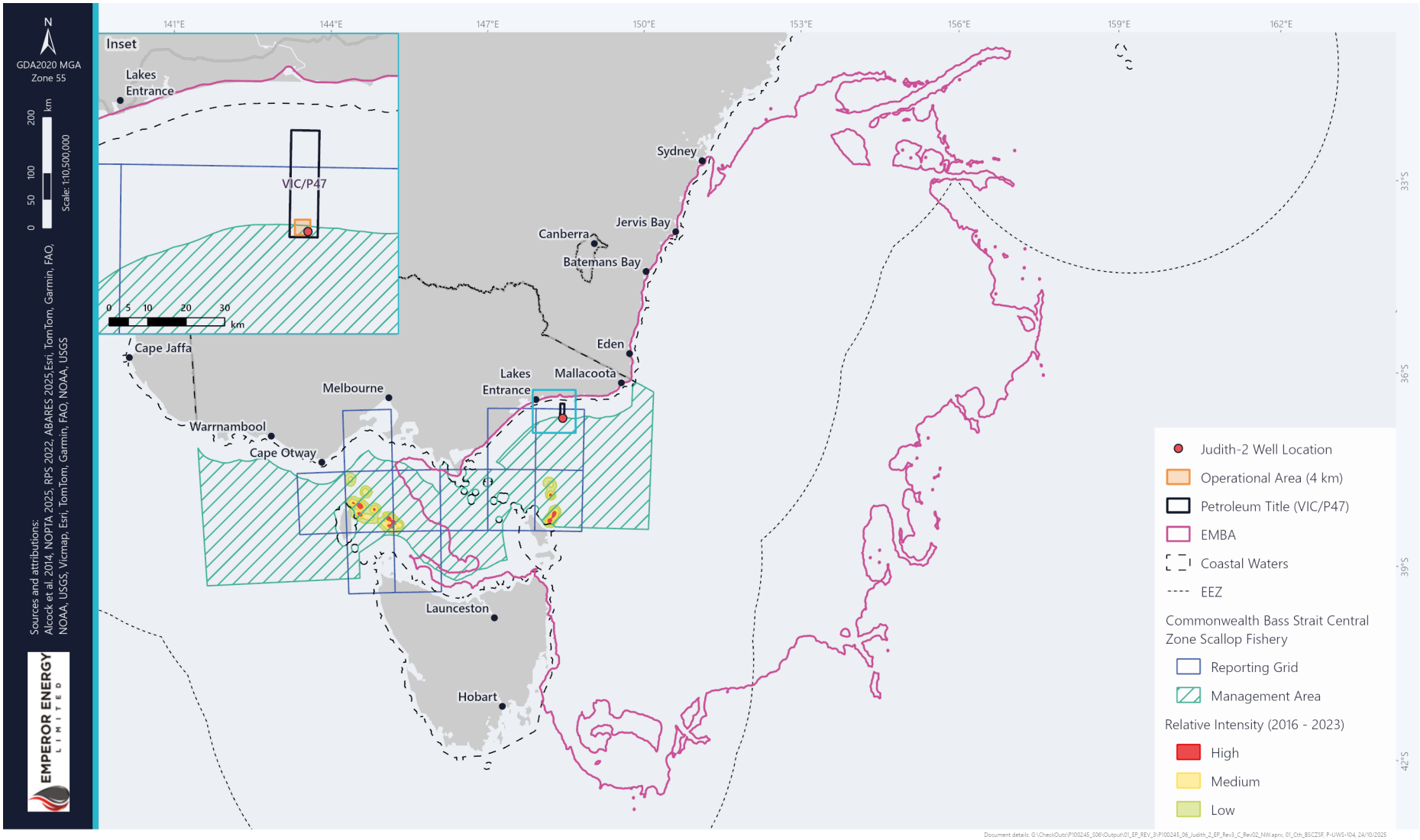


Figure 4-47: Management area and relative fishing intensity of the Bass Strait Central Zone Scallop Fishery within the EMBA

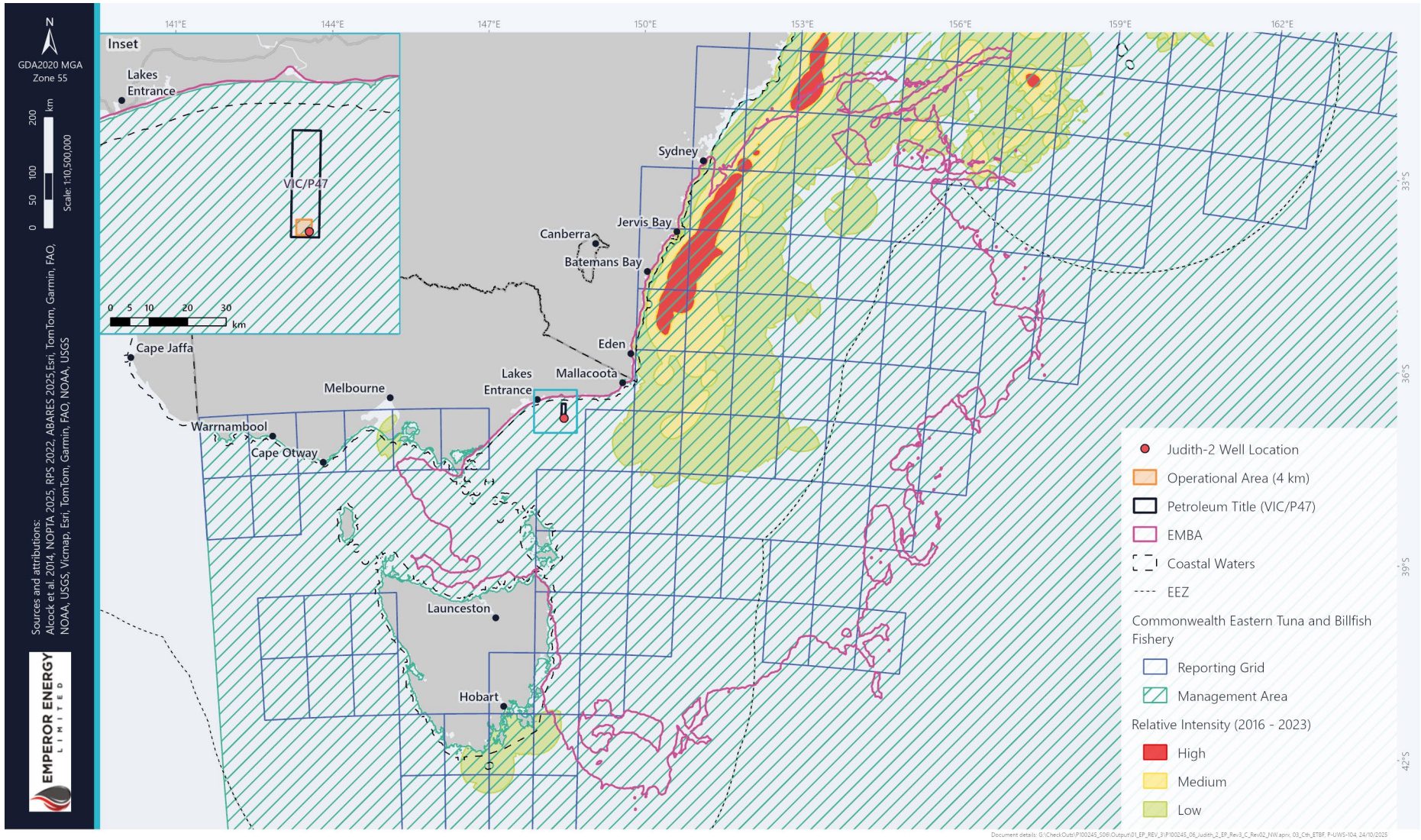


Figure 4-48: Management area and relative fishing intensity of the Eastern Tuna and Billfish Fishery within the EMBA

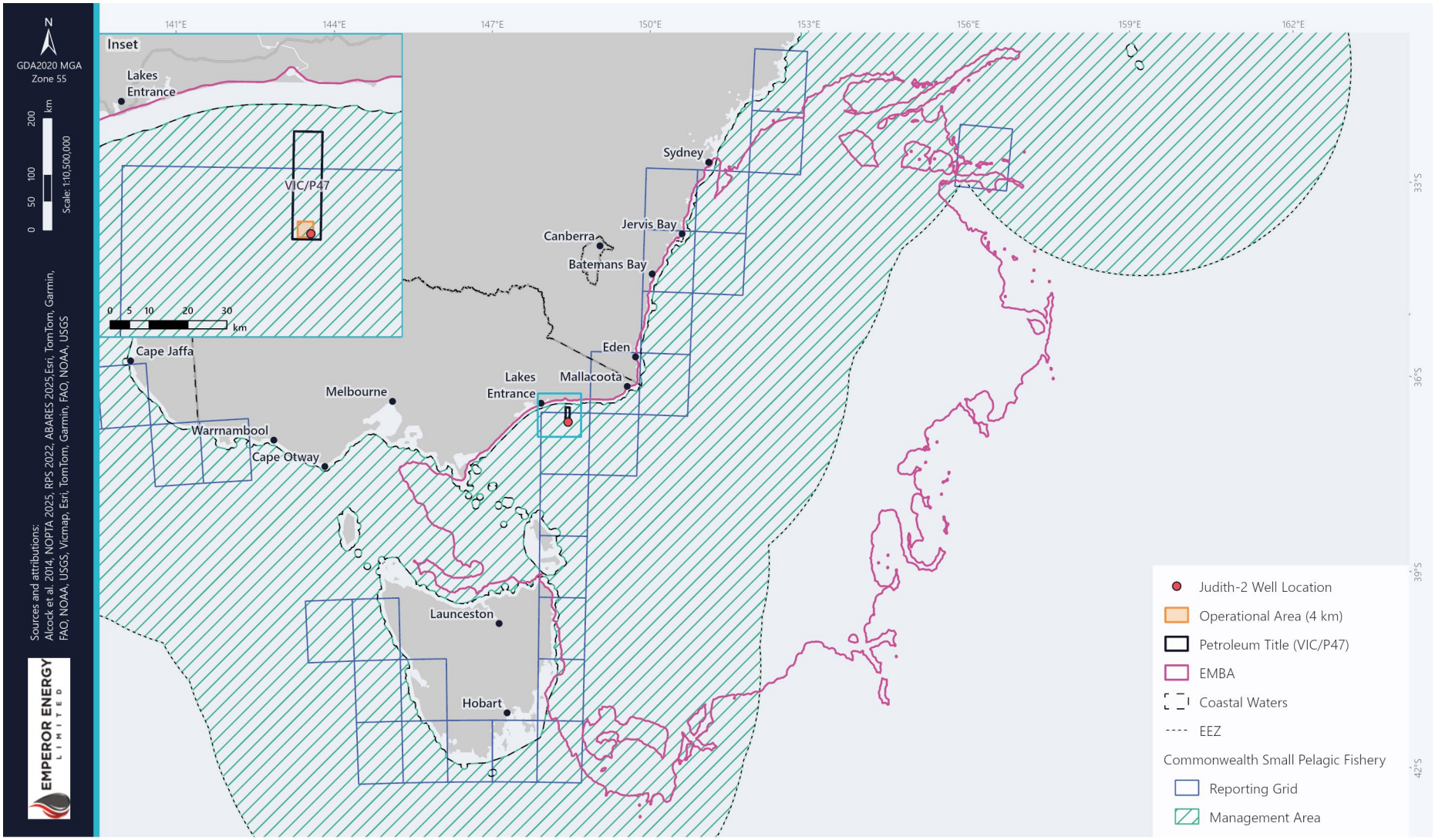


Figure 4-49: Management area and relative fishing intensity of the Small Pelagic Fishery within the EMBA

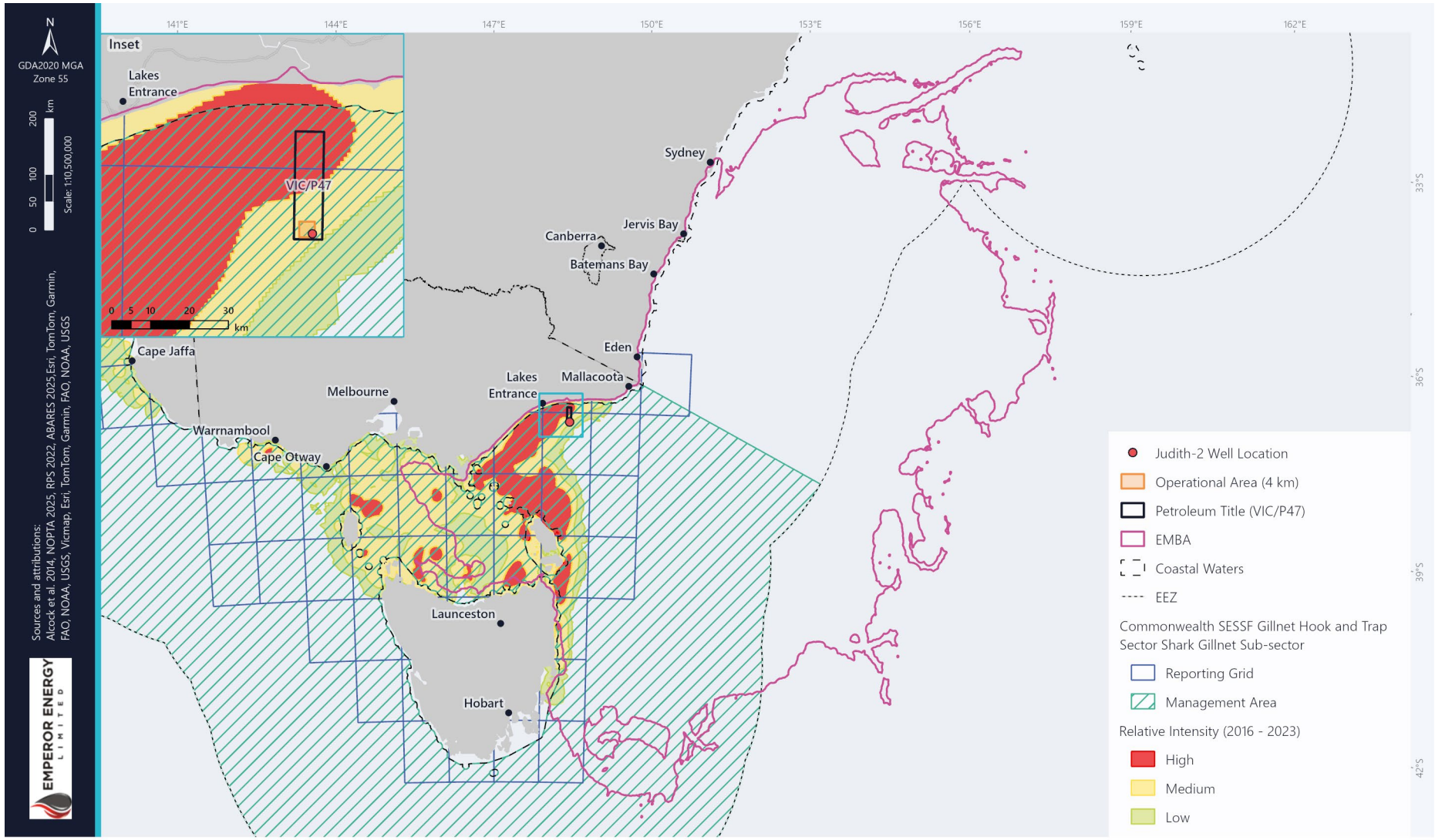


Figure 4-50: Management area and relative fishing intensity of the SESSF – Gillnet Hook Trap Sector (Shark Gillnet sub-sector) within the EMBA

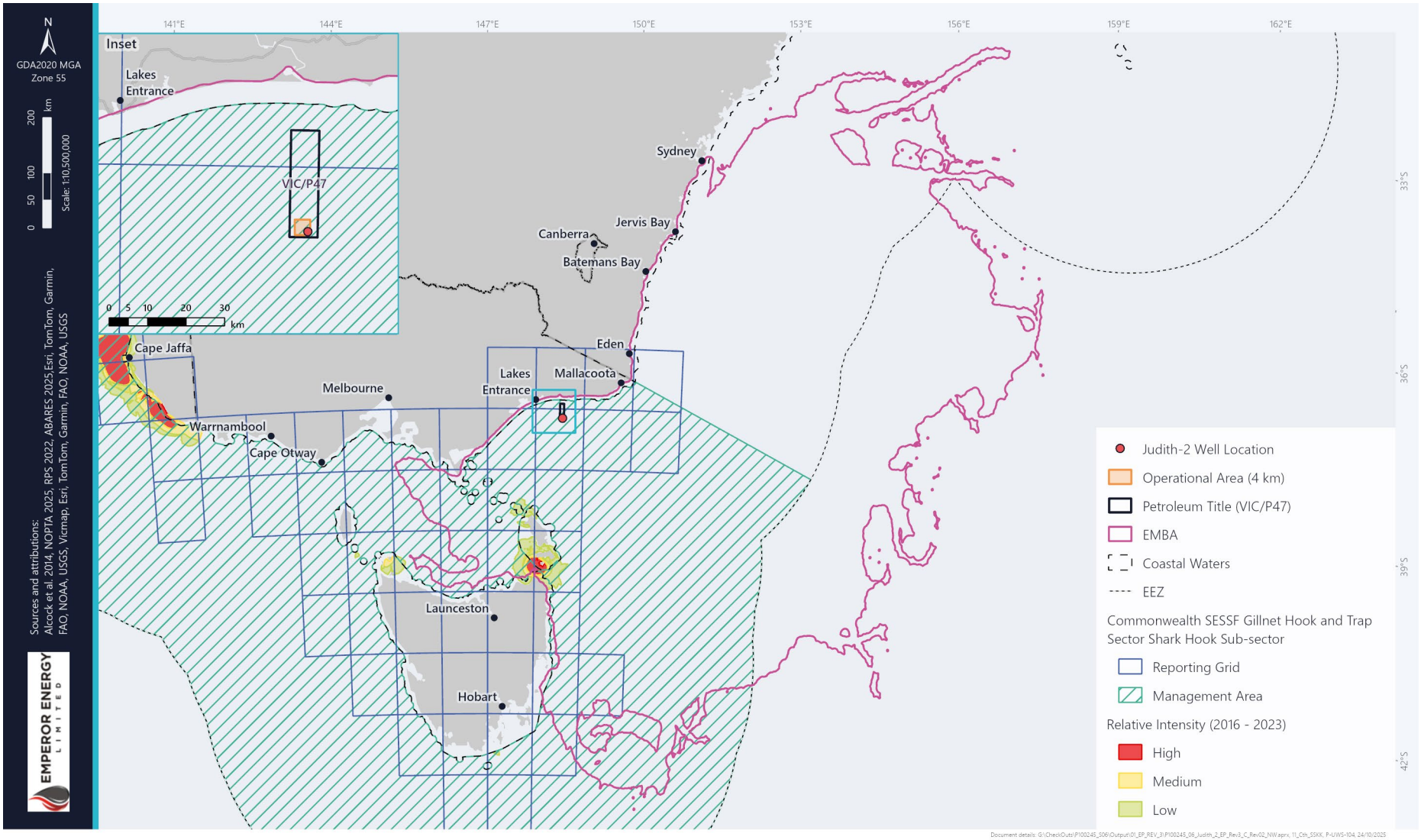


Figure 4-51: Management area and relative fishing intensity of the SESSF – Gillnet Hook Trap Sector (Shark Hook sub-sector) within the EMBA

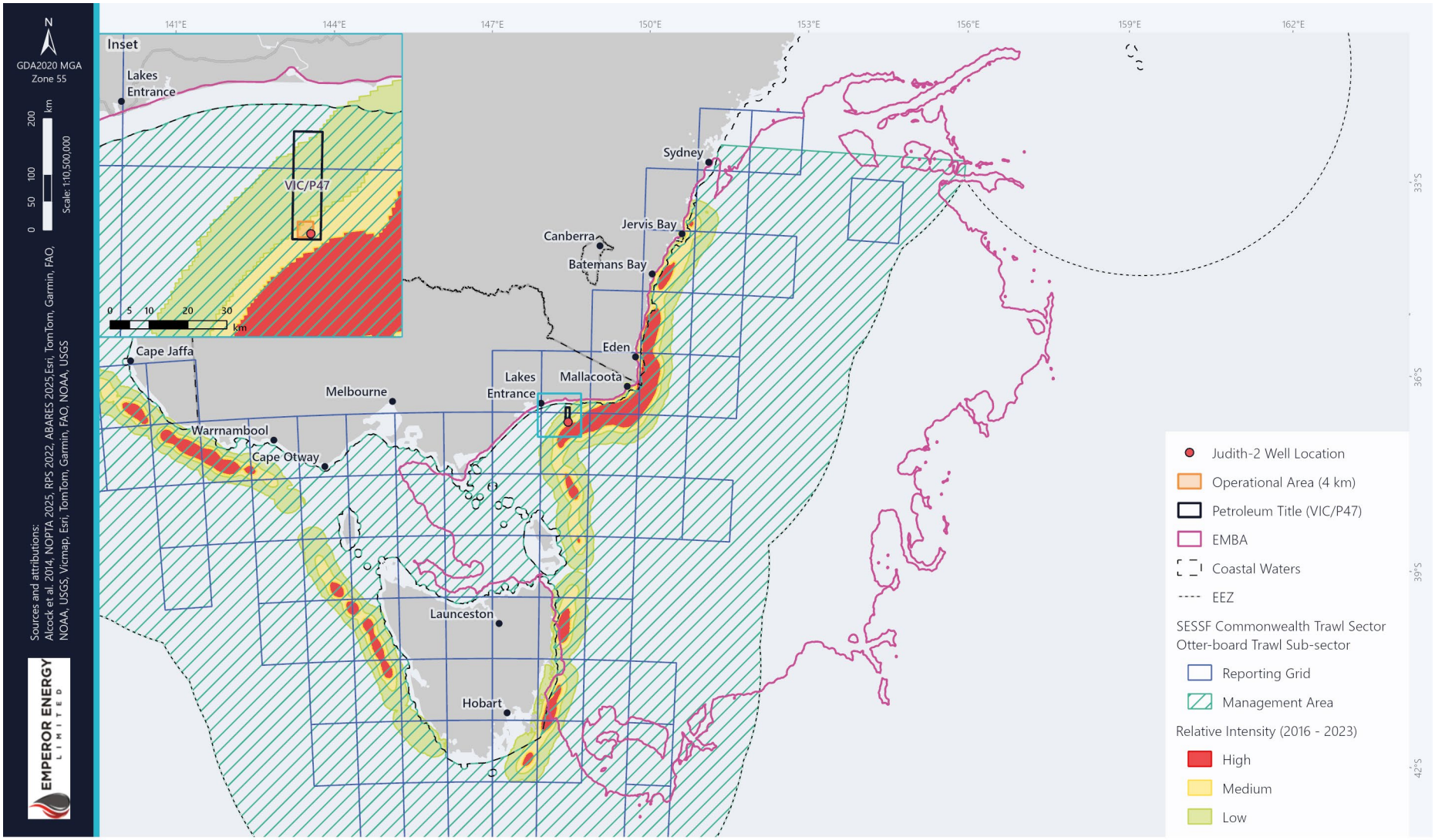


Figure 4-52: Management area and relative fishing intensity of the SESSF – CTS Otter-board trawl sub-sector within the EMBA

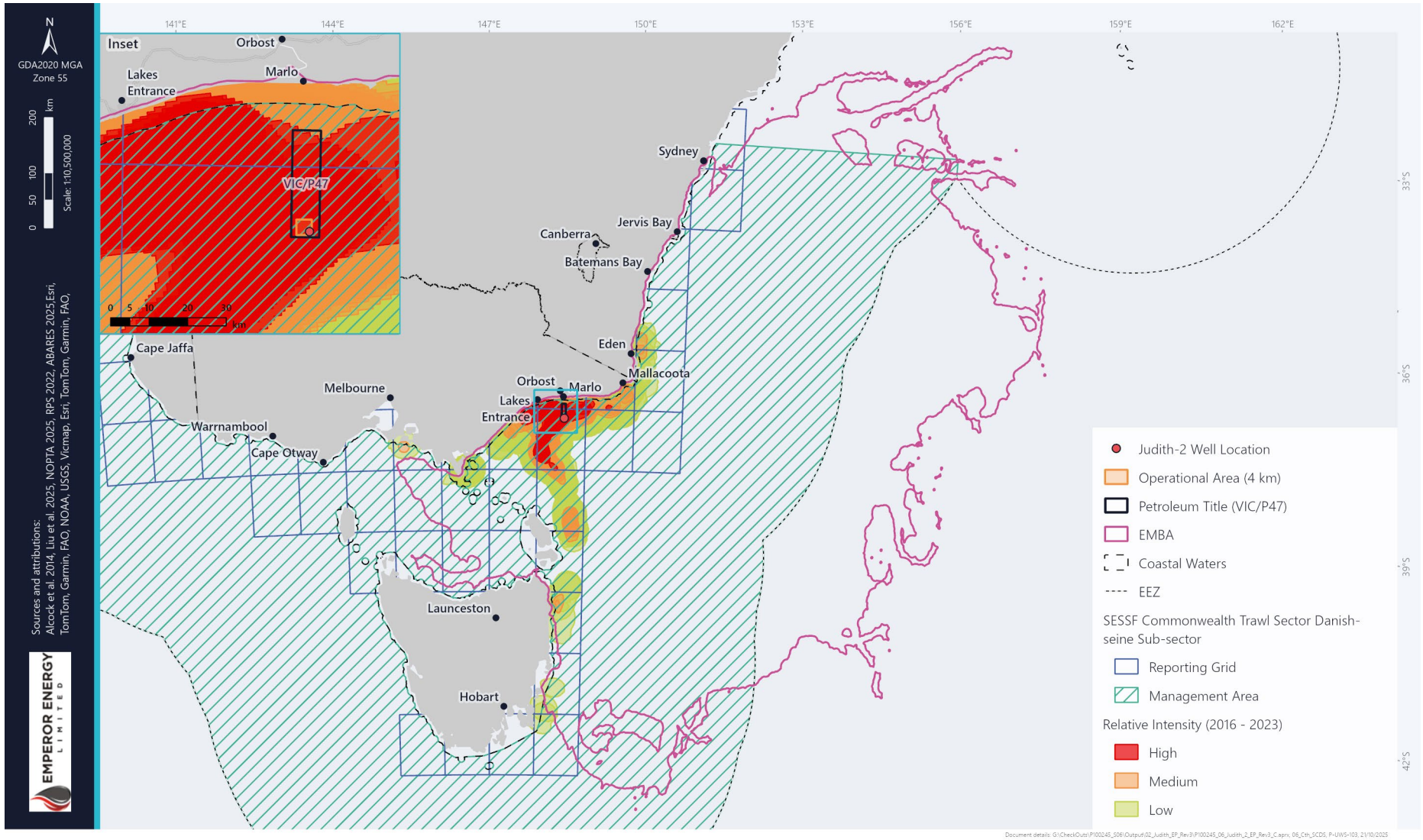


Figure 4-53: Management area and relative fishing intensity of the SESSF – CTS Danish-seine sub-sector within the EMBA

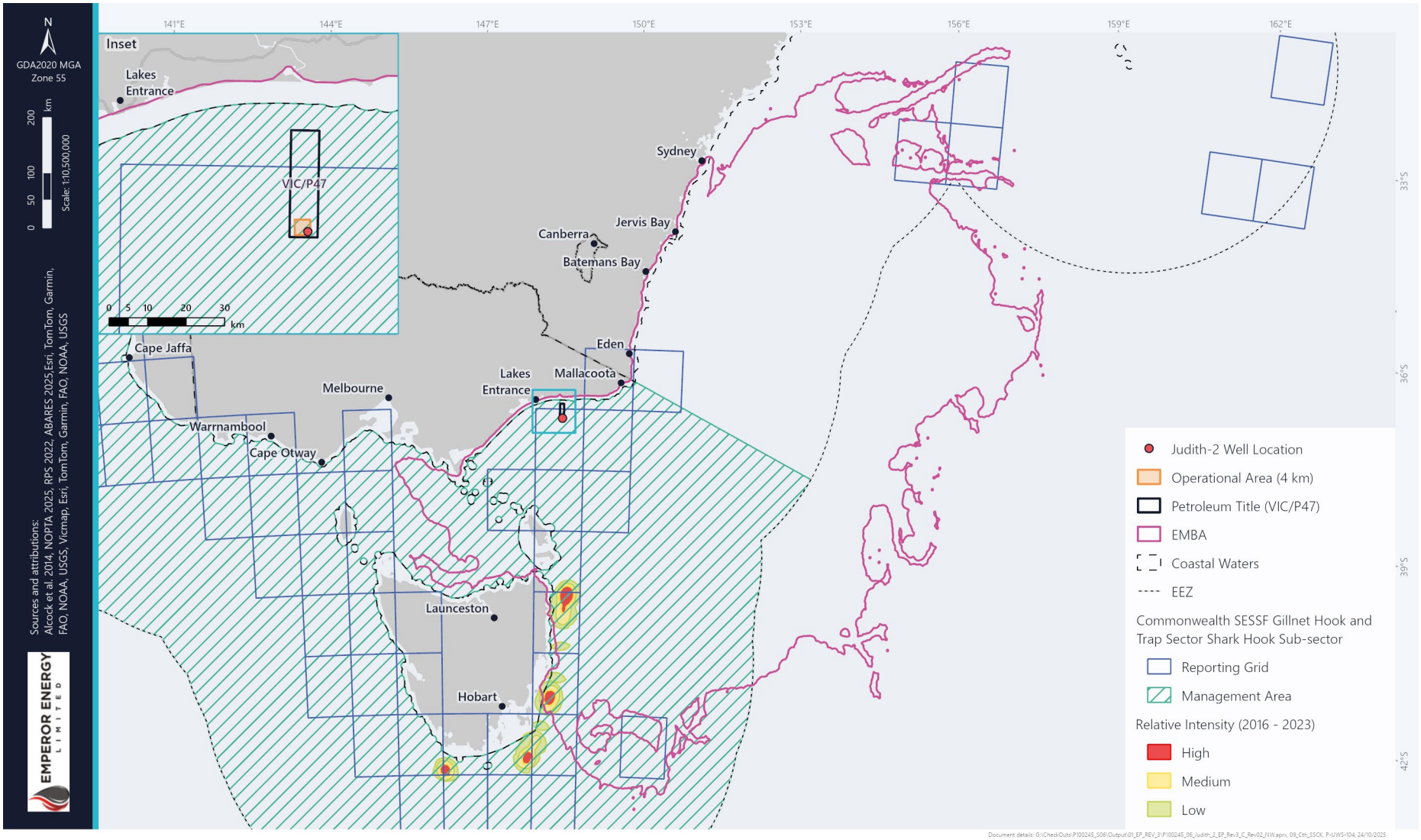


Figure 4-54: Management area and relative fishing intensity of the SESSF - Scalefish Hook Sector within the EMBA

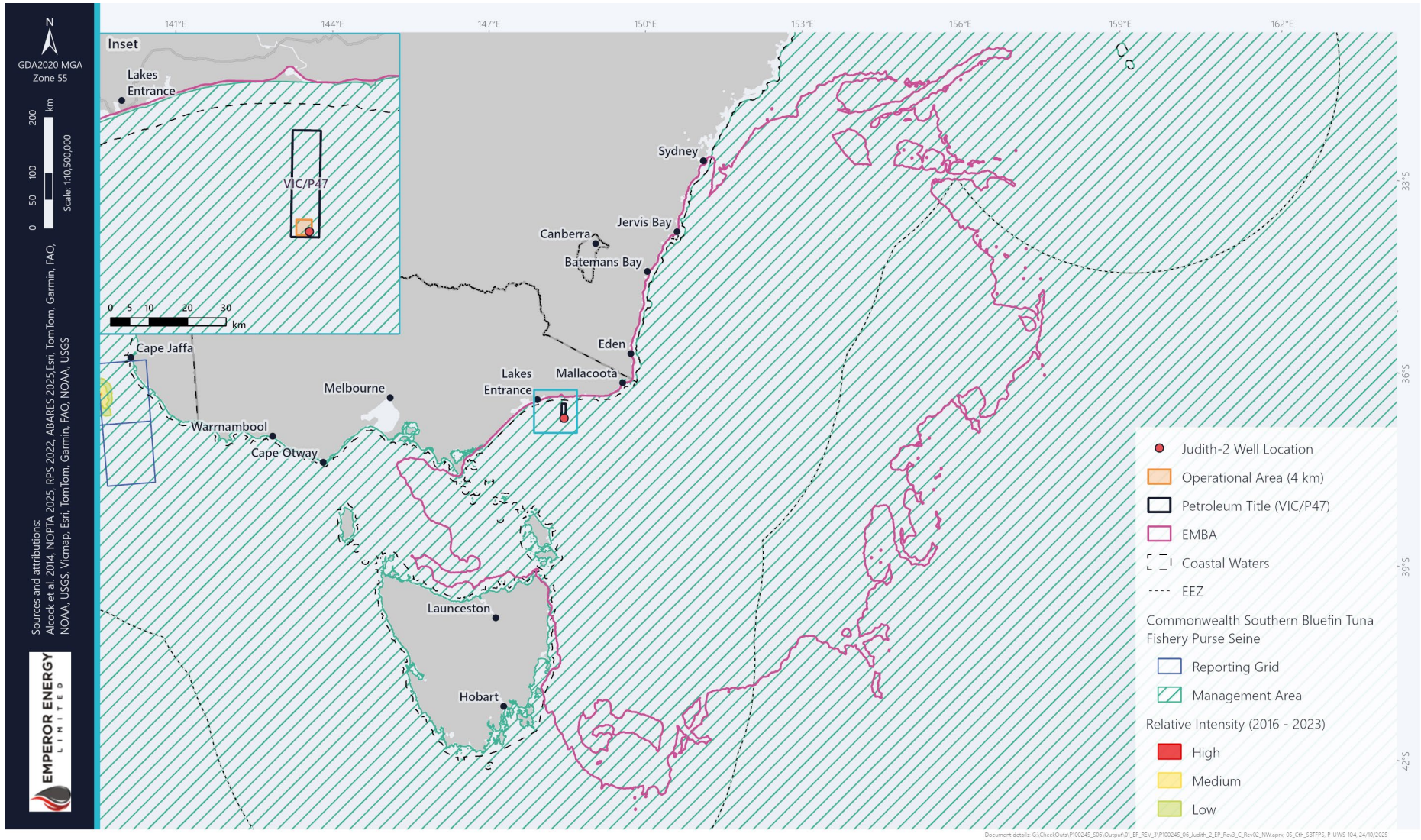


Figure 4-55: Management area and relative fishing intensity of the Southern Bluefin Tuna Fishery within the EMBA

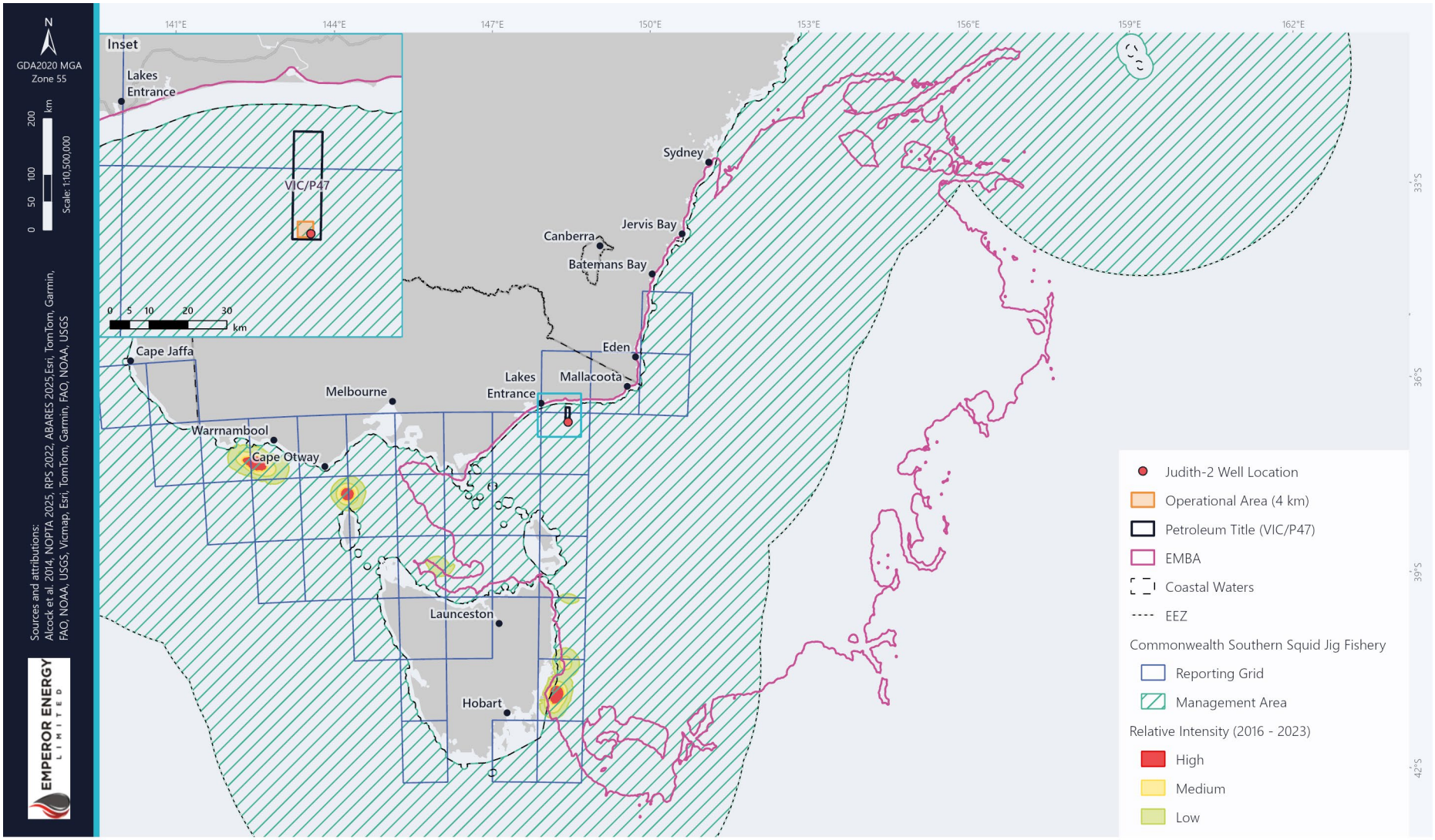


Figure 4-56: Management area and relative fishing intensity of the Southern Squid Jig Fishery within the EMBA

4.8.2. State-managed Commercial Fisheries

The EMBA extends across multiple state-managed commercial fisheries management areas, including Victoria, Tasmania and New South Wales (NSW).

4.8.2.1. Victoria

Victorian state fisheries are managed by the Victorian Fisheries Authority (VFA) under the State Fisheries Act 1995. VFA jurisdiction extends offshore to 3 nm with additional offshore constitutional settlements for specific fisheries beyond state boundaries into Commonwealth waters.

Seven Victorian-managed fisheries have management areas that intersect with the EMBA (Table 4-20). The Ocean Scallop Fishery has been identified to be active within the Operational Area between 2013 and 2023, with an additional nine fisheries that overlap with the EMBA.

Table 4-20: Description of Victorian-managed Fisheries with management areas overlapping Operational Area or EMBA

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY[1]	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA[2]
					OPERATIONAL AREA	EMBA	
Victorian Managed Fisheries[3]							
Abalone Fishery	Blacklip abalone (*Haliotis rubra*) Greenlip abalone (*H. laevigata*)	Abalone are caught along the majority of the Victorian coastline and is split into three management zones; eastern, central and western	Methods: Hookah gear (air is supplied through an air-hose connected to an air compressor on the vessel) Licences: 71 access licences Season: 12-month season beginning 1st April	Overlap occurs between the fishery management area and the EMBA. However, no recorded catch within the overlap between the 2013 and 2024 seasons.	-	✓	× Abalone diving occurs close to shoreline, in waters <30m depth. Therefore, interaction within the Operational Area at ~ 70 m depth is highly unlikely. Therefore, interactions with the fishery would be limited to activities within the EMBA.

[1] *Information for most recent fishing activity data provided by Victoria Fisheries Authority (personal communication, 27 October 2022)*
[2] *Information for most recent fishing activity data provided by Victoria Fisheries Authority (personal communication, 27 October 2022)*
[3] *Information for Victorian-managed fisheries sourced from VFA 2025*

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY[1]	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA[2]
					OPERATIONAL AREA	EMBA	
Giant Crab Fishery	Giant crab (*Pseudocarcinus gigas*)	The fishery extends from the Victorian coastline to latitude 40°S (between 140°57.9'S and 143°40' E) and 39°12'S (between 143°40'E and 150°20'E)	Methods: Baited commercial pots Licences: 30 access licences Season: Males – 15th September – 15th November Females – 1st June – 15th November	Overlap occurs between the fishery management area and the EMBA. However, there has been no recorded catch within the overlap between the 2013 - 2024 seasons. All catch was recorded in the western zone (Figure 4-57	-	✓	✗ Since 2013 there has been no catch and effort reported within the Operational Area. Given this, interactions with the fishery would be limited to activities within the EMBA.
Multi-species Ocean Fishery	Pale Octopus (*Octopus pallidus* Maori octopus (*Macroctopus maorum*) Gloomy octopus (*Octopus tetricus*)	This fishery is comprised of three sub-sectors: Ocean fishery, Commercial permit fishery and the Octopus fishery (central and western zone).	Methods: Variety Licences/permits: confidential Season: Year-round	Overlap occurs between the fishery management area and the EMBA. Since 2013 there has been recorded catch and effort reported within fishing blocks intersected by the EMBA (Figure 4-58). Fishing effort shows up to 6 vessels active and an average total of 46 days fished between 2013 and 2024.	-	✓	✗ The Operational Area is located within the management area, however, no previous fishing effort has been recorded since 2013. Given this, interactions with the fishery would be limited to

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY[1]	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA[2]
					OPERATIONAL AREA	EMBA	
							activities within the EMBA.
Octopus Fishery	Pale Octopus (*Octopus pallidus* Maori octopus (*Macroctopus maorum*) Gloomy octopus (*Octopus tetricus*)	There are three management zones for the fishing of octopus in Victoria. The fishery only authorises take from the eastern zone while the central and western zones are managed through the VFA through exploratory, temporary permits.	Methods: Pots Licences: 11 licences Season: Year-round.	Overlap occurs between the fishery management area and the EMBA. Since 2013 there has been recorded catch and effort reported within fishing blocks intersected by the EMBA (Figure 4-59). Between 2013-2024 up to 7 active vessels and an average total of 13 days were fished within blocks overlapped by the EMBA.	-	✓	× The Operational Area is located within the management area, however, no previous fishing effort has been recorded since 2013. Given this, interactions with the fishery would be limited to activities within the EMBA.
Rock Lobster Fishery	Southern Rock Lobster (*Jasus edwardsii*)	The fishery extends from the Victorian coastline to latitude 40°S	Methods: Baited commercial pots Licences: 71 licences Season:	Overlap occurs between the fishery management area and the EMBA. Since 2013 there has been recorded catch and effort reported within	✓	✓	× The Operational Area is located within the

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY[1]	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA[2]
					OPERATIONAL AREA	EMBA	
		(between 140°57.9'S and 143°40' E) and 39°12'S (between 143°40'E and 150°20'E)	15th September – 15th November Females – 1st June – 15th November	fishing blocks intersected by the EMBA (Figure 4-60). Between 2013-2024 up to 7 active vessels and an average total of 52 days were fished within blocks overlapped by the EMBA.			management area. However, no previous fishing effort is recorded within the Operational Area between 2013-2023 seasons. Given this, interactions with the fishery would be limited to activities within the EMBA.
Ocean Scallop Fishery	Commercial Scallop (*Pecten fumatus*)	The fishery includes Victorian state waters out to 20 nautical miles from the high tide water mark but excludes the bays and inlets along the coast where commercial	Methods: Towed scallop dredges Licences: 88 licences Season: Year-round.	Overlap occurs between the fishery management area and the EMBA. Since 2013 there has been recorded catch and effort reported within fishing blocks intersected by the EMBA (Figure 4-61). Between 2013-2024 up to 11 active vessels and an average total of 10 days were fished within blocks overlapped by the EMBA.	✓	✓	✓ One block within the Operational Area have reported catch in effort since 2013. In 2019, one vessel was active in the Operational Area for 1 day. There has been no fishing effort since 2019.

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY[1]	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA[2]
					OPERATIONAL AREA	EMBA	
		fishing for scallops is prohibited.					Therefore, although unlikely, it is considered there is potential for interaction within the Operational Area.
Sea Urchin Fishery	White sea urchin (*Heliocidaris erythrogramma*) Black, long-spined sea urchin (*Centrostephanus rodgersii*)	The fishery has been operating as a 'developing fishery' under permits since 1998. There are four management zones where commercial sea urchin divers can fish in Victoria.	Methods: Harvest by hand through diving Licences: the number of licenses for this fishery is not capped. Season: Year-round	There is no overlap between the fishery management area and the EMBA. Therefore, no recorded catch and effort has been reported within the EMBA.	-	✓	✖ No data or published management zones provided as data cannot be reported on a spatial level due to confidentially (Baker P. pers. Comm. 2024). There are 4 management zones where commercial sea urchin divers can fish in Victoria. Recently the Port Phillip Bay zone

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY[1]	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA[2]
					OPERATIONAL AREA	EMBA	
							and the Eastern zone have been allocated a total allowable catch TACC to better manage stock status and ensure long term sustainability. The eastern zone extends from Lakes Entrance to the New South Wales border. Given the water depth in the Operational Area, the potential for interaction with the fishery is not considered likely. Given this, interactions with the fishery would be limited to activities within the EMBA.

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY[1]	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA[2]
					OPERATIONAL AREA	EMBA	
Wrasse Fishery	Blue-Throat Wrasse (*Notolabrus tetricus*) Saddled Wrasse (*N. fucicola*) Orange-Spotted Wrasse (*N. parilus*)	The fishery extends along the entire length of the Victorian coastline and out to 20 nm offshore, except for marine reserves.	Methods: Primarily hook and line Licences: 22 access licences Season: Year-round.	Overlap occurs between the fishery management area and the EMBA. Since 2013 there has been recorded catch and effort reported within fishing blocks intersected by the EMBA (Figure 4-62). Between 2013-2023 up to 4 vessels were active and an average total of 49 days were fished within blocks overlapped by the EMBA.	-	✓	× The Operational Area is located within the management area. However, no previous fishing effort is recorded within the Operational Area between 2013-2024 seasons. Given this, interactions with the fishery would be limited to activities within the EMBA.
Commercial Pipi Fishery	Pipi (*Donax deltoides*)	The fishery operates mainly in Discovery Bay and is limited to marine waters outside Port Phillip Bay, Western	Methods: Hand collection using dip nets (no mechanical harvesting permitted) Licences: 162 access licences issued; only a	Overlap occurs between the fishery management area and the EMBA. However, no recorded catch within the overlap between the 2013 and 2024 seasons.		✓	× The Operational Area is located within the management area. However, no previous fishing effort is recorded

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY[1]	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA[2]
					OPERATIONAL AREA	EMBA	
		Port, Gippsland Lakes, and marine reserves.	small number endorsed for pipi harvest Season: Year-round				within the Operational Area between 2013-2024 seasons. Given this, interactions with the fishery would be limited to activities within the EMBA.
Inshore Trawl Fishery	Bay Bug (*Thenus orientalis*), Eastern King Prawn (*Melicertus plebejus*), Sand Crab (*Ovalipes australiensis*), School Prawn (*Metapenaeus macleayi*)	The fishery operates in Victorian coastal waters under state jurisdiction	Methods: Trawl nets. The non-specific nature of trawl fishing can result in other species being taken as bycatch. Licences: 54 access licences Season: Year-round	Overlap occurs between the fishery management area and the EMBA. Since 2013 there has been recorded catch and effort reported within fishing blocks intersected by the EMBA (Figure 4-63) Between 2013-2024 an average total of 154 days were fished within blocks overlapped by the EMBA.		✓	× Since 2013 there has been no catch and effort reported within the Operational Area. Given this, interactions with the fishery would be limited to activities within the EMBA.

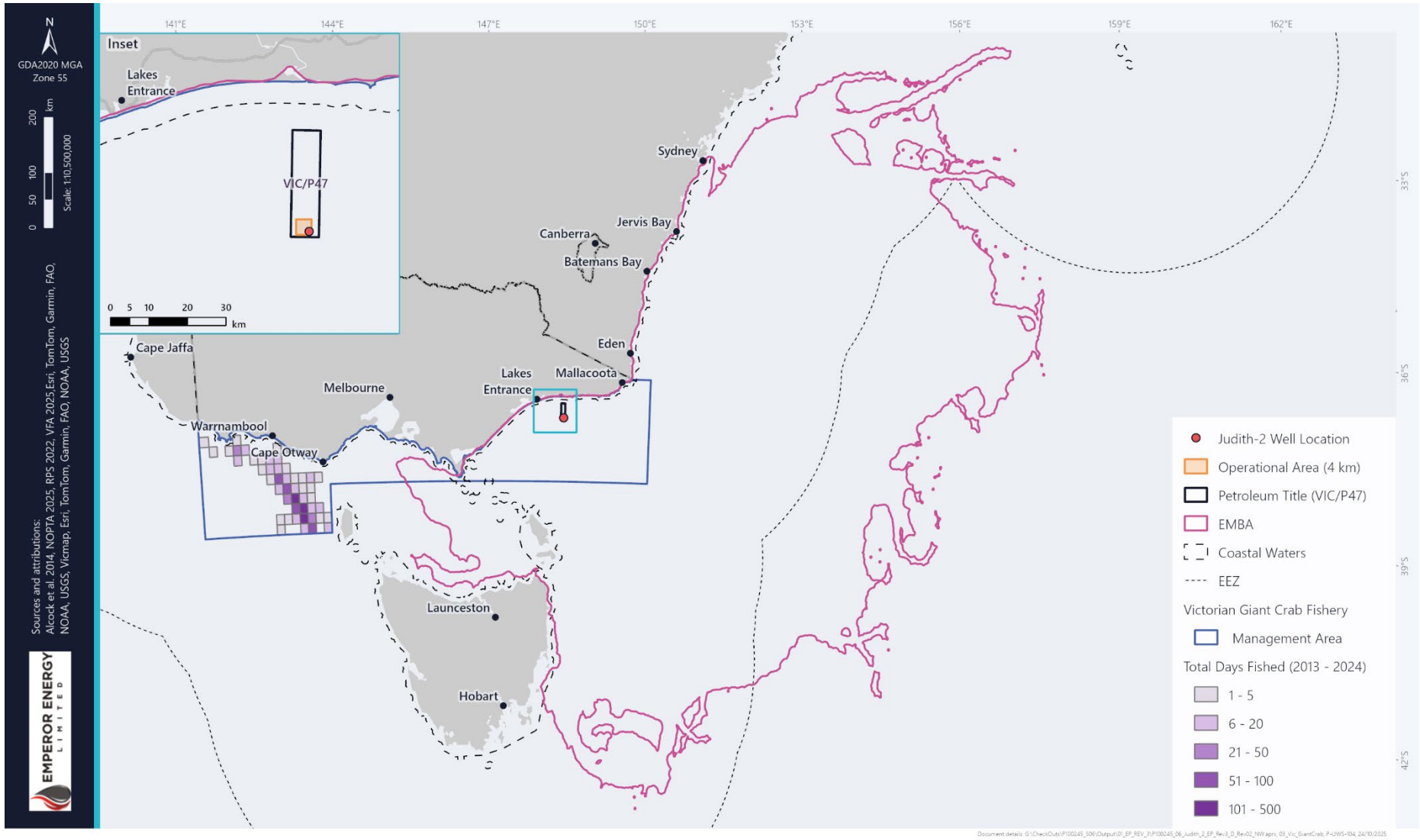


Figure 4-57: Management area and relative fishing effort for the Victorian Giant Crab Fishery and overlap with EMBA

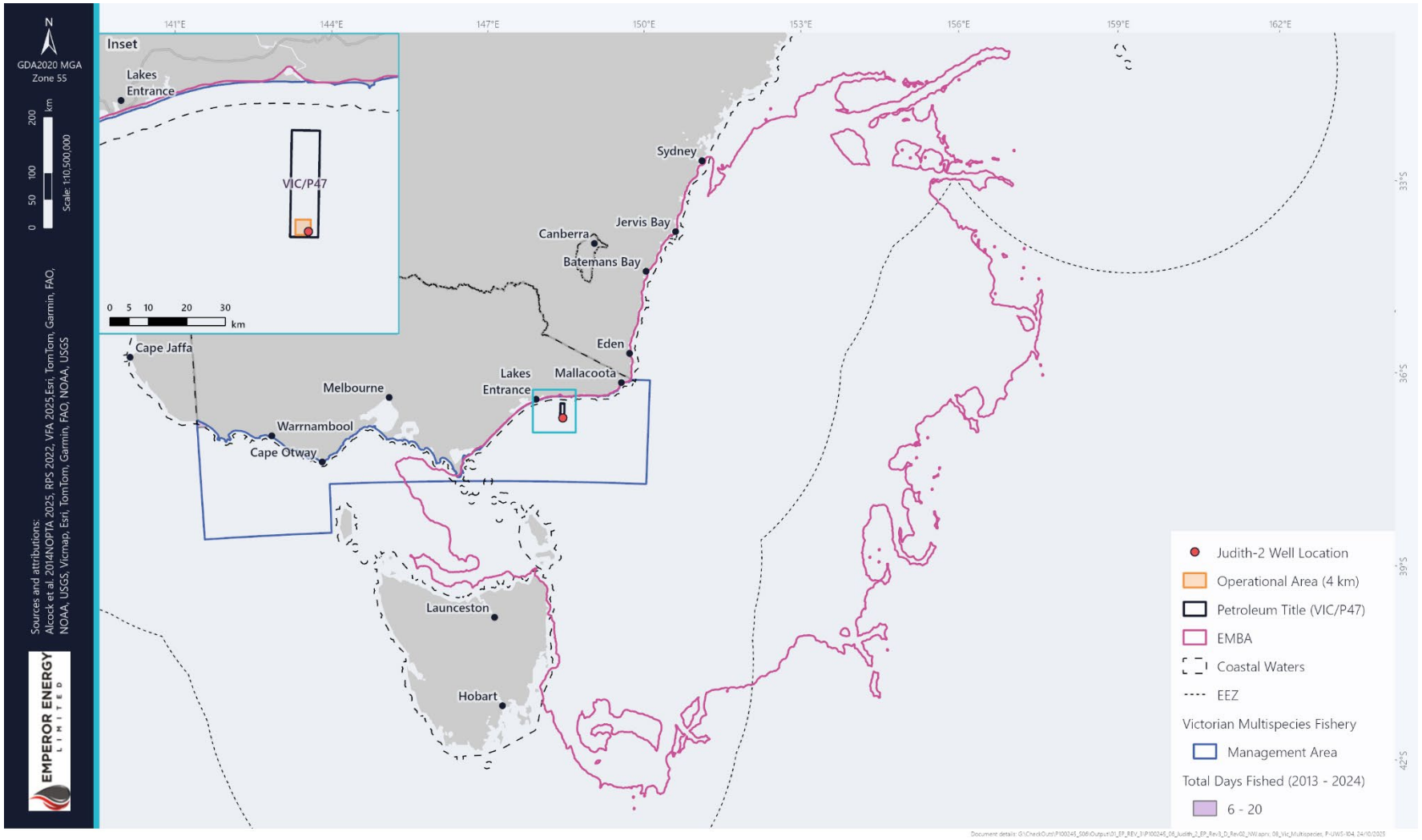


Figure 4-58: Management area and relative fishing effort for the Victorian Multi-species Ocean Fishery and overlap with EMBA

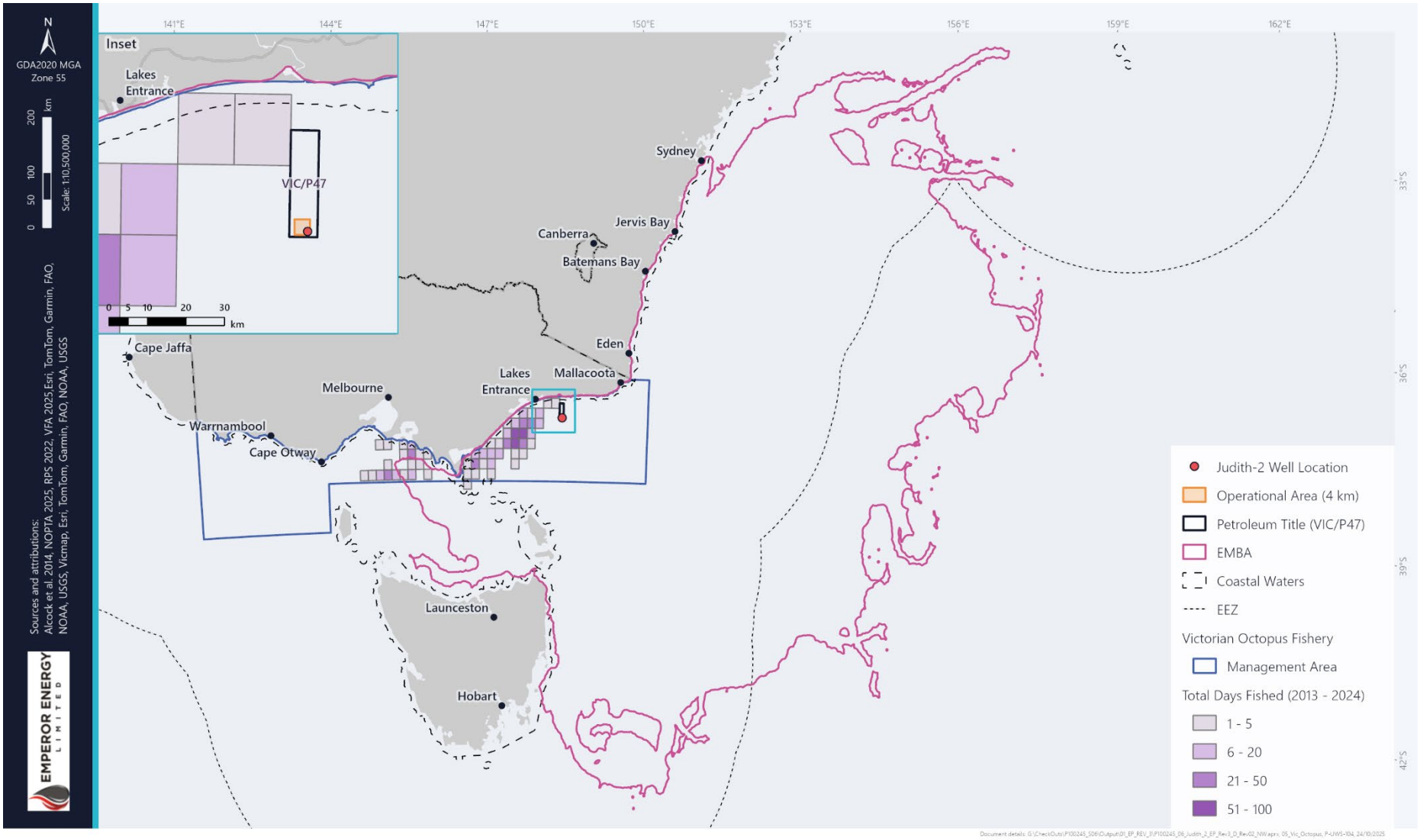


Figure 4-59: Management area and relative fishing effort for the Victorian Octopus Fishery and overlap with EMBA

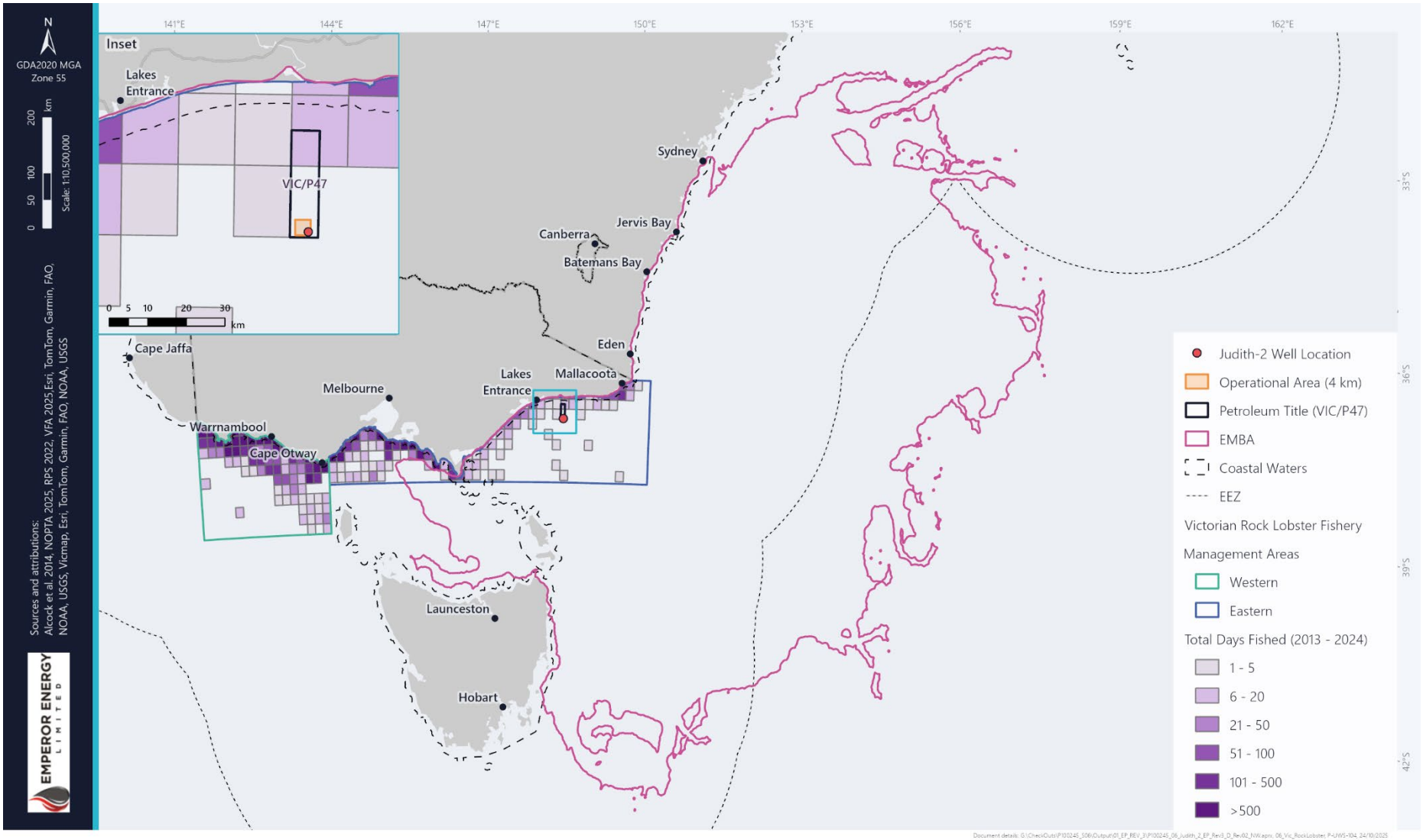


Figure 4-60: Management area and relative fishing effort for the Victorian Rock Lobster Fishery and overlap with EMBA

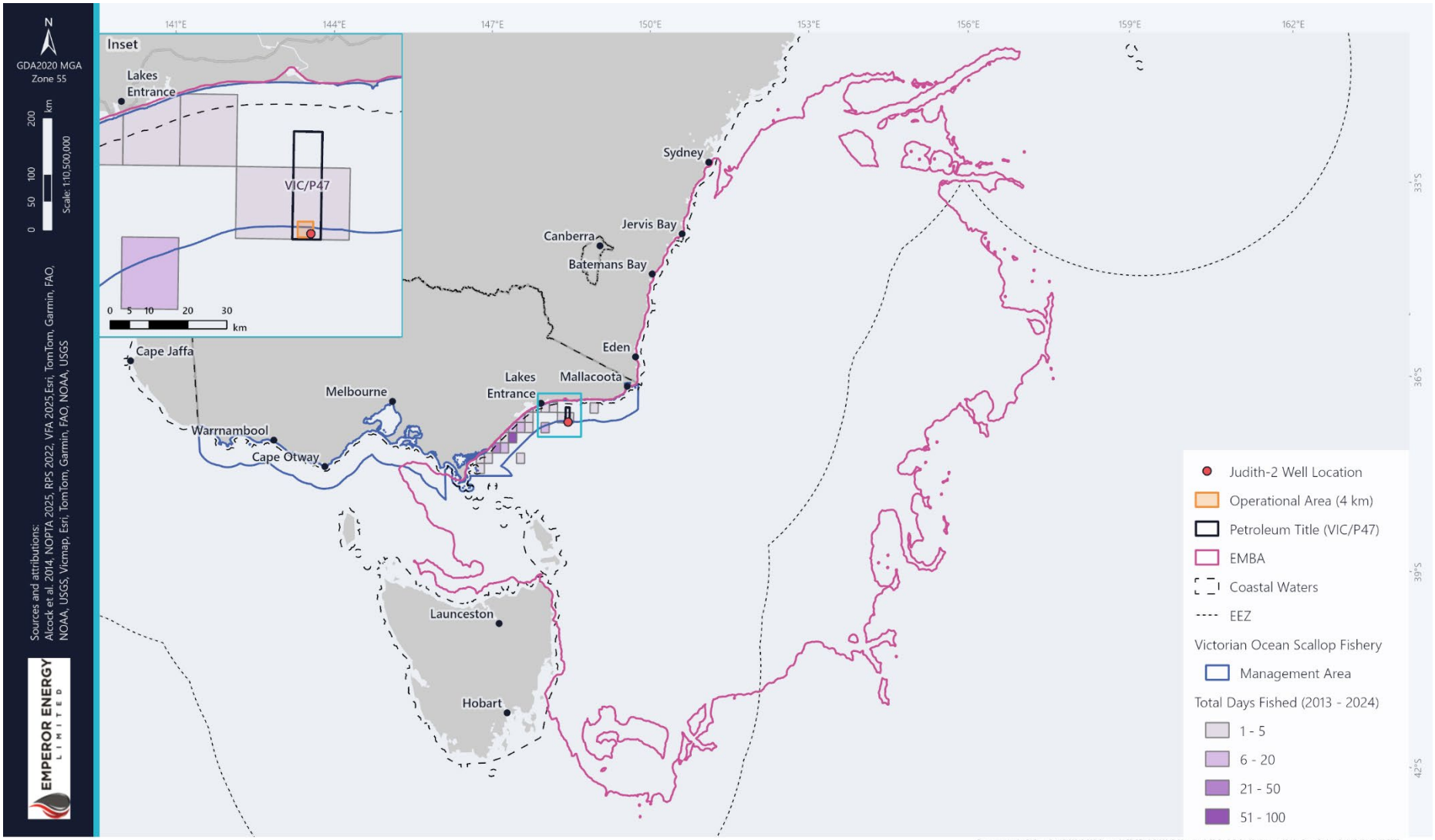


Figure 4-61: Management area and relative fishing effort for the Victorian Scallop Fishery and overlap with EMBA

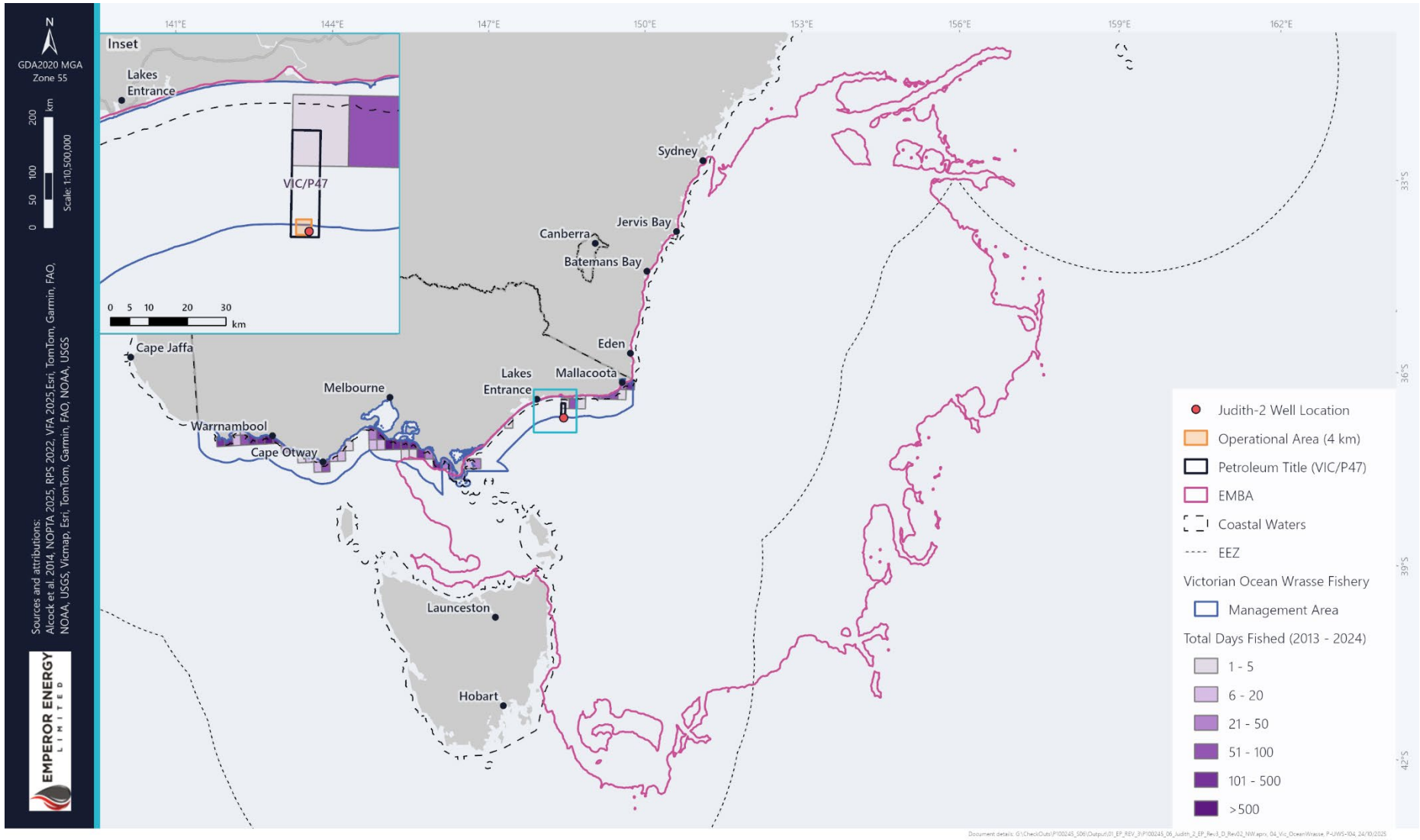


Figure 4-62: Management area and relative fishing effort for the Victorian Wrasse Fishery and overlap with EMBA

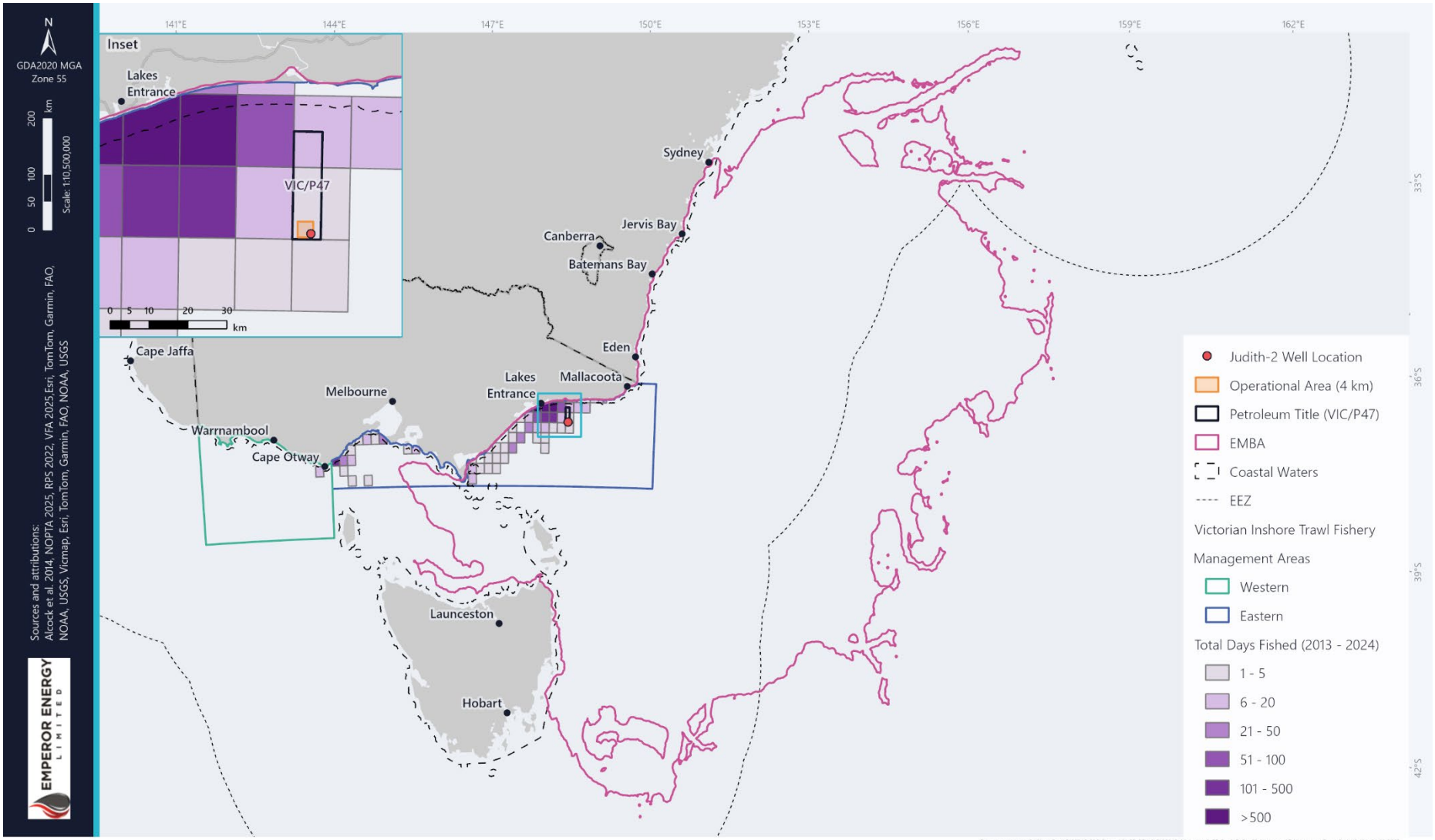


Figure 4-63: Management area and relative fishing effort for the Victorian Inshore Fishery and overlap with EMBA

4.8.2.2. Tasmania

Tasmanian state fisheries are managed by the Department of Natural Resources and Environment Tasmania (DNRET) under the Living Marine Resources Management Act 1995. DNRET jurisdiction covers all waters that are within the limits of the state with additional offshore constitutional settlements for specific fisheries beyond state boundaries into Commonwealth waters. Nine Tasmanian-managed fisheries have management areas that intersect the EMBA (Table 4-21), therefore any potential interaction would be limited to unplanned activities within the EMBA.

Table 4-21: Description of Tasmanian-managed Fisheries with management areas overlapping the Operational Area or EMBA

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
Tasmanian State Fisheries[4]							
Abalone Fishery (Figure 4-64)	Blacklip abalone (*Haliotis rubra*) Greenlip abalone (*H. laevigata*)	The fishery is divided into five commercial zones; eastern blacklip, western blacklip, northern blacklip, Bass Strait blacklip and greenlip (state-wide)	Methods: Hand collection through diving. Licences: 121 dive entitlements. Season: Year-round however zones closures may be in place due to stock structure	In 2021 the total estimated landings were 749 t of blacklip and 84 t of greenlip, fulfilling the total allowable commercial catch of 833 t. The 2024 season has a total allowable catch (TAC) of 668.5 t blacklip and 87.5 t greenlip.	-	✓	× There is no potential for interaction in the Operational Area as the Operational Area lies outside Tasmanian state waters.
Commercial Dive Fishery	Short spined sea urchin (*Heliocidaris erythrogramma*), Long spined sea urchin (*Centrostephanus rodgersii*) Periwinkles	The fishery is divided into five commercial dive zones; Northern, north-eastern, central-eastern, south-eastern and western.	Methods: Hand collection through diving. Licences: 53 dive licences. Season: Year-round.	Long spined sea urchin: In the 2023/24 season the total estimated landings were 385 t. Currently there have been 7.6 t of recorded catch in the 2024/25 season. There is no set TAC for this species. Short spined sea urchin: Overlap between the fishery and the EMBA occurs in the northern	-	✓	× There is no potential for interaction in the Operational Area as the Operational Area lies outside

[4] *Information for Tasmanian-managed fisheries sourced from DNRET 2024 and IMAS Publications and Resources 2020*

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
	(*Lunella undulata*).			zone and the north eastern zone. Total allowable commercial catches of 19.5 t and 18.5 t respectively, have been set for these zones for the 2024/25 season. Currently there has been no recorded catch in the northern zone and 10.6 t has been recorded in the north-eastern zone. Periwinkle: Overlap between the fishery and the EMBA may occur in the northern zone and the north eastern zone. Total allowable commercial catches of 8.1 t and 5.5 t respectively, have been set for these zones for the 2024/25 season. Currently there has been no recorded catch in the northern zone and no data recorded for the north eastern zone.			Tasmanian state waters.
Giant Crab Fishery	Giant crab (*Pseudocarcinus gigas*)	The fishery has 8 management areas which are split into two regions, east	Methods: baited pots.	Overlap between the fishery and the EMBA may occur in the east assessment region (Figure 4-65).	-	✓	✗ There is no potential for interaction in the

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
		and west, and cover the Tasmanian coastline and state waters.	Licences: 84 licences in 2013/14. Season: Males – Year-round. Females – 16th November – 31st May.	The 2024/25 season has set a TAC of 20.7 t. As of 1st of August, 2024, 9.7 t has been recorded.			Operational Area as the Operational Area lies outside Tasmanian state waters.
Octopus Fishery	Pale Octopus (*Octopus pallidus* Maori octopus (*Macroctopus maorum*) Gloomy octopus (*Octopus tetricus*)	The fishery operates off the north coast of Tasmania and in the Bass Strait, covering the entire Tasmanian coastline.	Method: unbaited shelter pots. Licences: 2 active licences. Season: Year-round.	Overlap between the fishery and the EMBA may occur in the Bass Strait zone, specifically the Flinders Island east and west, and the eastern section of the Tasmanian Shelf which covers the remainder of state waters. In 2023 total recorded catch of the pale octopus (key target species) was 101 t with 313,348 recorded pot-lifts.	-	✓	There is no potential for interaction in the Operational Area as the Operational Area lies outside Tasmanian state waters.
Scalefish Fishery	Banded morwong (*Cheilodactylus spectabilis*) Southern calmari (*Sepioteuthis australis*)	The fishery operates across the Tasmanian coastal waters and is managed as one area.	Methods: Include, but are not limited to, drop-line, Danish seine, fish trap, hand-line and spear.	Overlap between the fishery and the EMBA may occur in the eastern blocks of the management area (Figure 4-66). In 2022/23 the species with the highest recorded catch were:	-	✓	✗ There is no potential for interaction in the Operational Area

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
	Southern garfish (*Hyporhamphus melanochir*) Wrasse (*Notolabrus sp.*) Tiger flathead (*Neoplatycephalus richardsoni*) Southern school whiting (*Sillago flindersi*) East Australian salmon (*Arripis trutta*) Barracouta (*Thyrsites atun*), Bastard trumpeter (*Latridopsis forsteri*) Blue warehou (*Seriolella brama*) Gould's squid (*Nototodarus gouldi*)		Licences: 106 active licences in 2020. Season: Year-round.	Gould's squid – 670 t Southern calamari – 84.2 t Australian sardine – 62.1 t Tiger flathead – 50.5 t			as the Operational Area lies outside Tasmanian state waters.

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
Scallop Fishery	Commercial scallop (*Pecten fumatus*)	The fishery extends 200 nautical miles from the Tasmanian coast, with the exception of Bass Strait, where its jurisdiction covers 3-20 nautical miles offshore.	Methods: Benthic scallop dredge Licences: 11 active licences in 2015. Season: 19th June 2025 – 31 December 2022.	Overlap between the fishery and the EMBA may occur in the north east. The fishery was open to fishing in 2024. The fishery closed in 2016 due to low stock numbers however was approved to reopened for the 2022 season. As of 9 December 2024: 2,404.6 t (60.1% of the TAC) had been landed.	-	✓	× There is no potential for interaction in the Operational Area as the Operational Area lies outside Tasmanian state waters.
Marine Plant Fishery	Bull kelp (*Nereocystis luetkeana*) Wakame (*Undaria pinnatifida*).	The fishery operates in Tasmanian coastal waters. Seaweed can only be harvested onshore however, Undaria is an exception as it is an invasive species and divers can hand collect.	Methods: Beach harvesting, hand collect or dive. Licences: 18 active beach-cast licenses, 6 active *Undaria* licenses Season: Year-round.	Overlap between the fishery and the EMBA may occur in the undaria zone as well as the unzoned area. The majority of onshore seaweed collection occurs on King Island, Marrawah and Granville Harbour all outside the EMBA.	-	✓	× There is no potential for interaction in the Operational Area as the Operational Area lies outside Tasmanian state waters.

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
Shellfish Fishery	Pacific oysters (*Crassostrea gigas*) Native oysters (*Ostrea angasi*) *Venerupis* Clams *Katelysia* cockles	The fishery operates in restricted areas which were once historically identified through research and a permitting process.	Methods: Harvest by hand, either by diving or wading Licences: 2 – native oysters 2 – clams 1 – cockles.	Overlap between the fishery and the EMBA may occur in Georges Bay and Anson's Bay where oysters, clams and cockles are targeted. TAC for the 2024/25 season: Pacific oysters (state-wide) – NA Native oyster – 20, 046 dozen Clams – 840 kg.	-	✓	× There is no potential for interaction in the Operational Area as the Operational Area lies outside Tasmanian state waters.
Southern Rock Lobster	Southern Rock Lobster (*Jasus edwardsii*)	The fishery operates in state and Commonwealth waters surrounding Tasmania.	Methods: Baited pots Licences: 164 licenced vessels in 2020/21 Season: Males – 16th November – 31st September Females – 16th November – 31st April	Overlap between the fishery and the EMBA may occur in the east assessment region. Specifically, over blocks 3 and 4 (Figure 4-64). The 2024/25 season has set a TAC of 1050.7 t. As of 31 October 2024, 520.5 t of the catch has been landed.	-	✓	× There is no potential for interaction in the Operational Area as the Operational Area lies outside Tasmanian state waters.

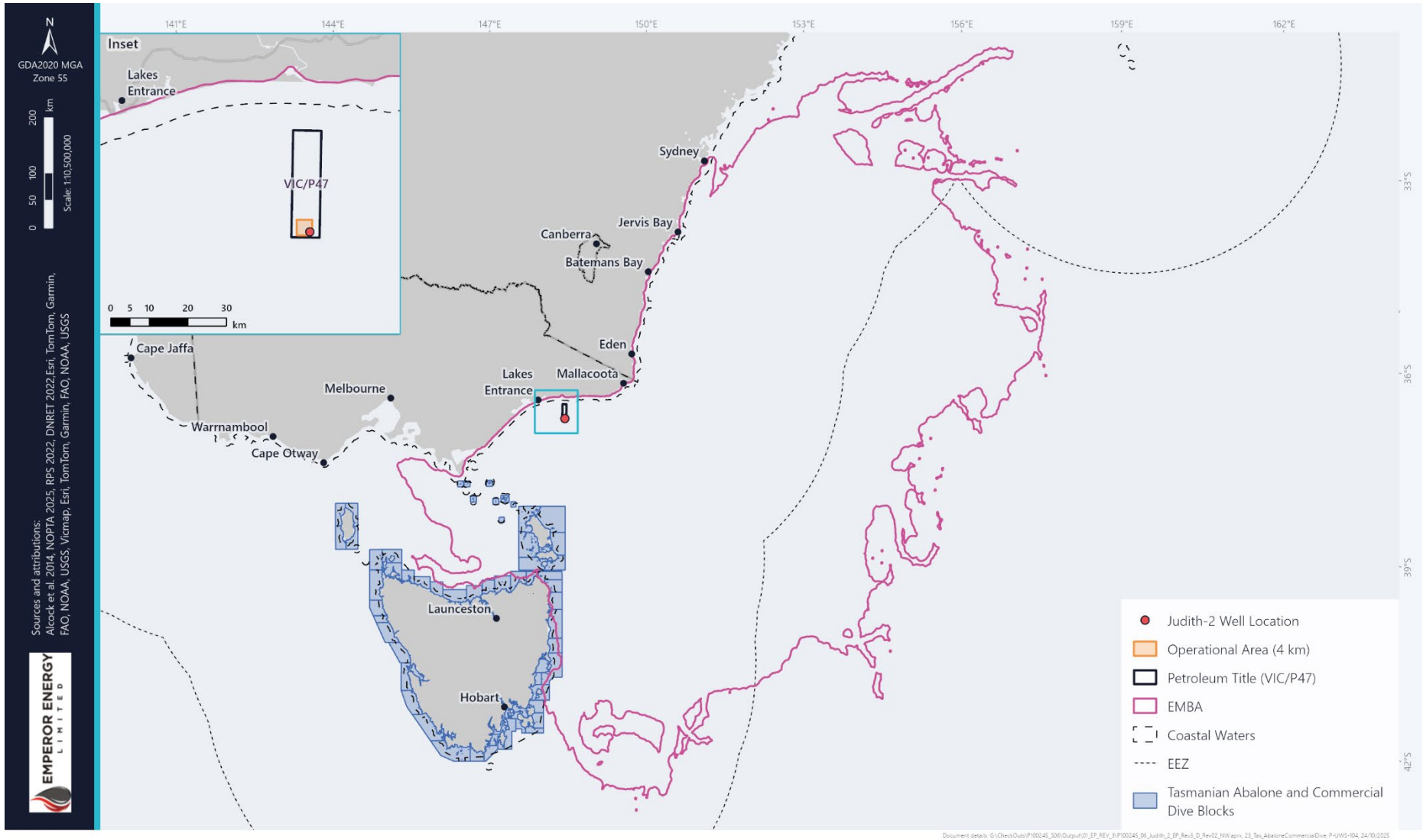


Figure 4-64: Tasmanian Abalone Fishery overlap with EMBA

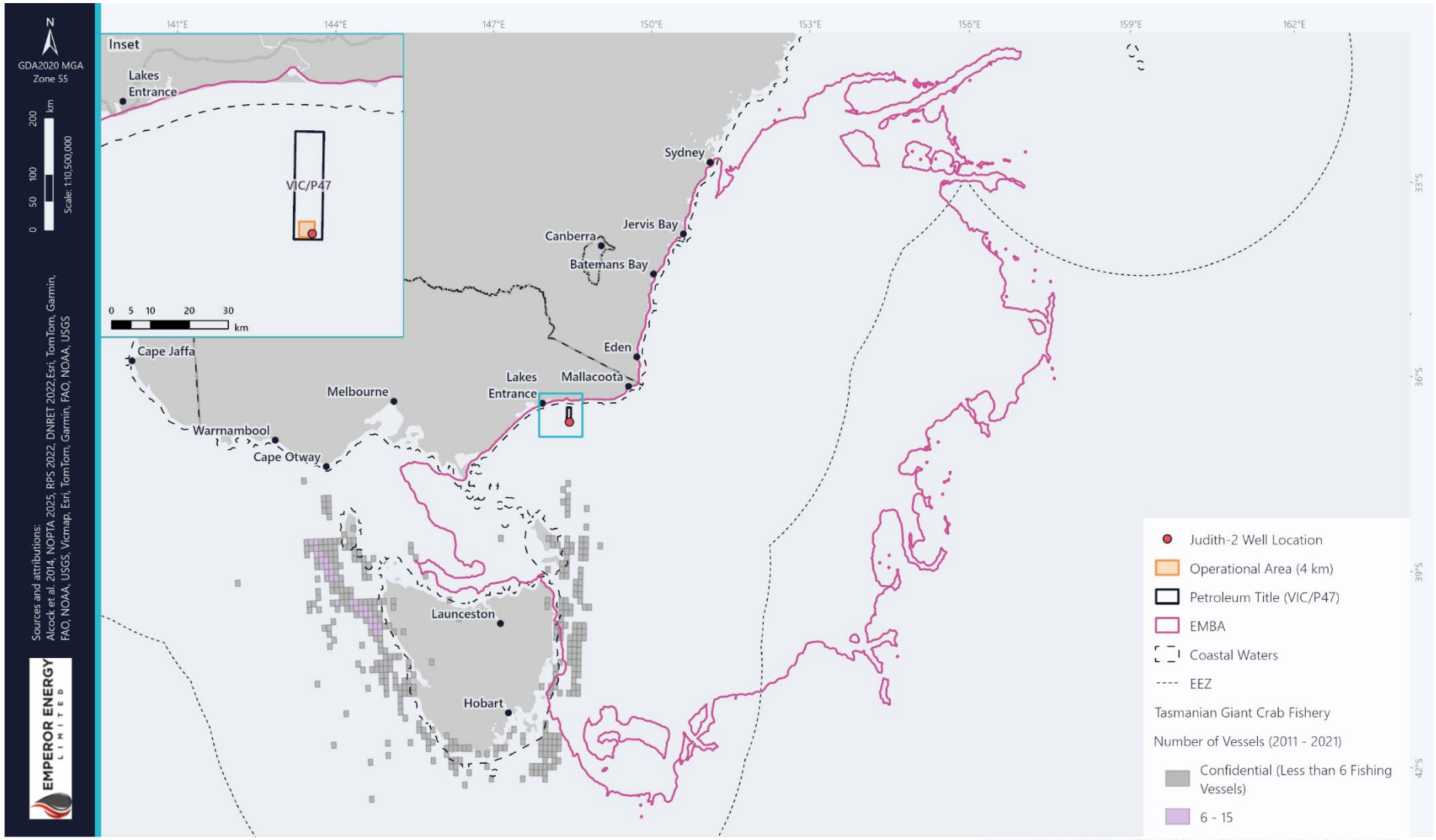


Figure 4-65: Tasmanian Giant Crab Fishery overlap with EMBA

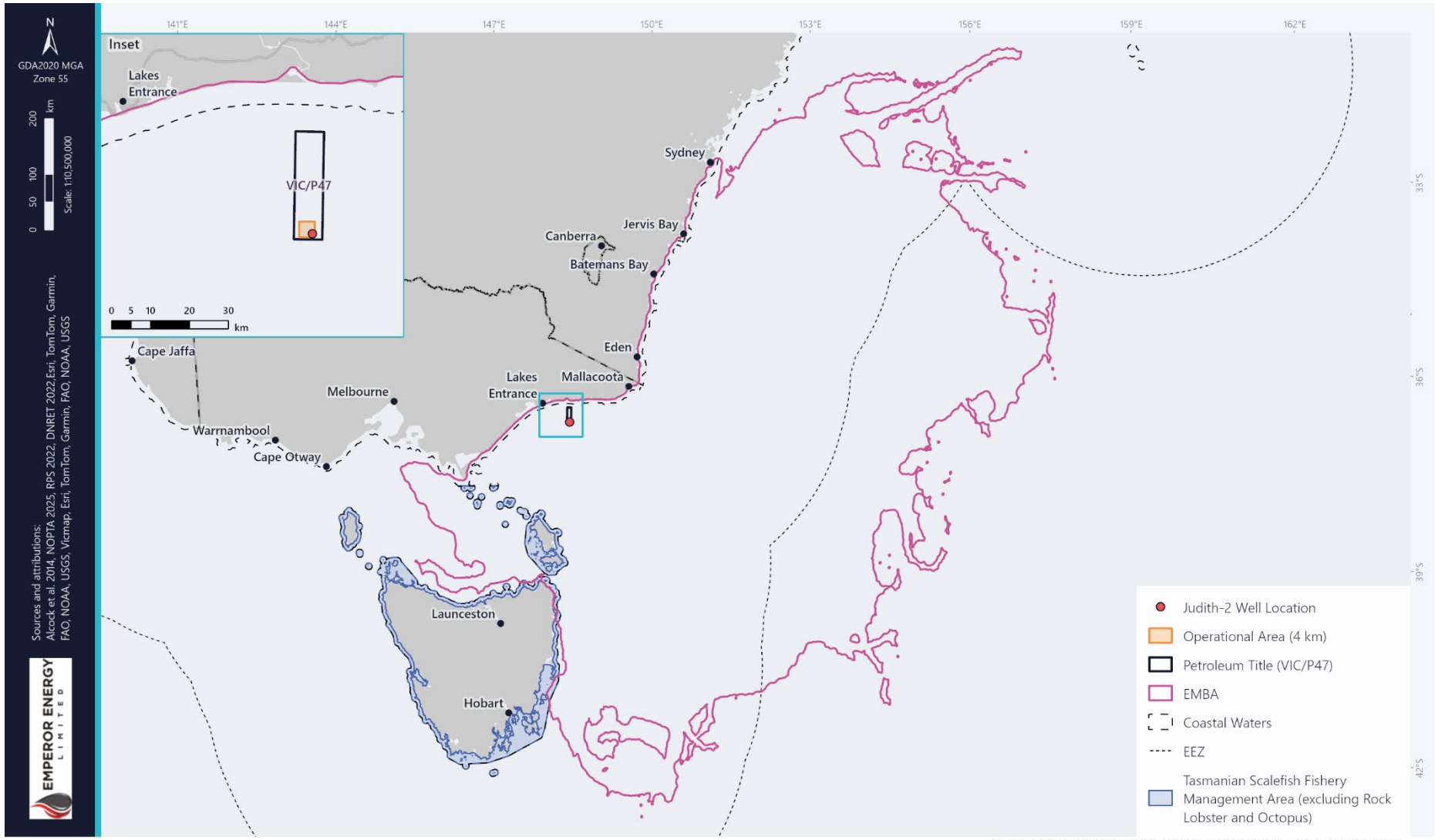


Figure 4-66: Tasmanian Scalefish Fishery overlap with EMBA

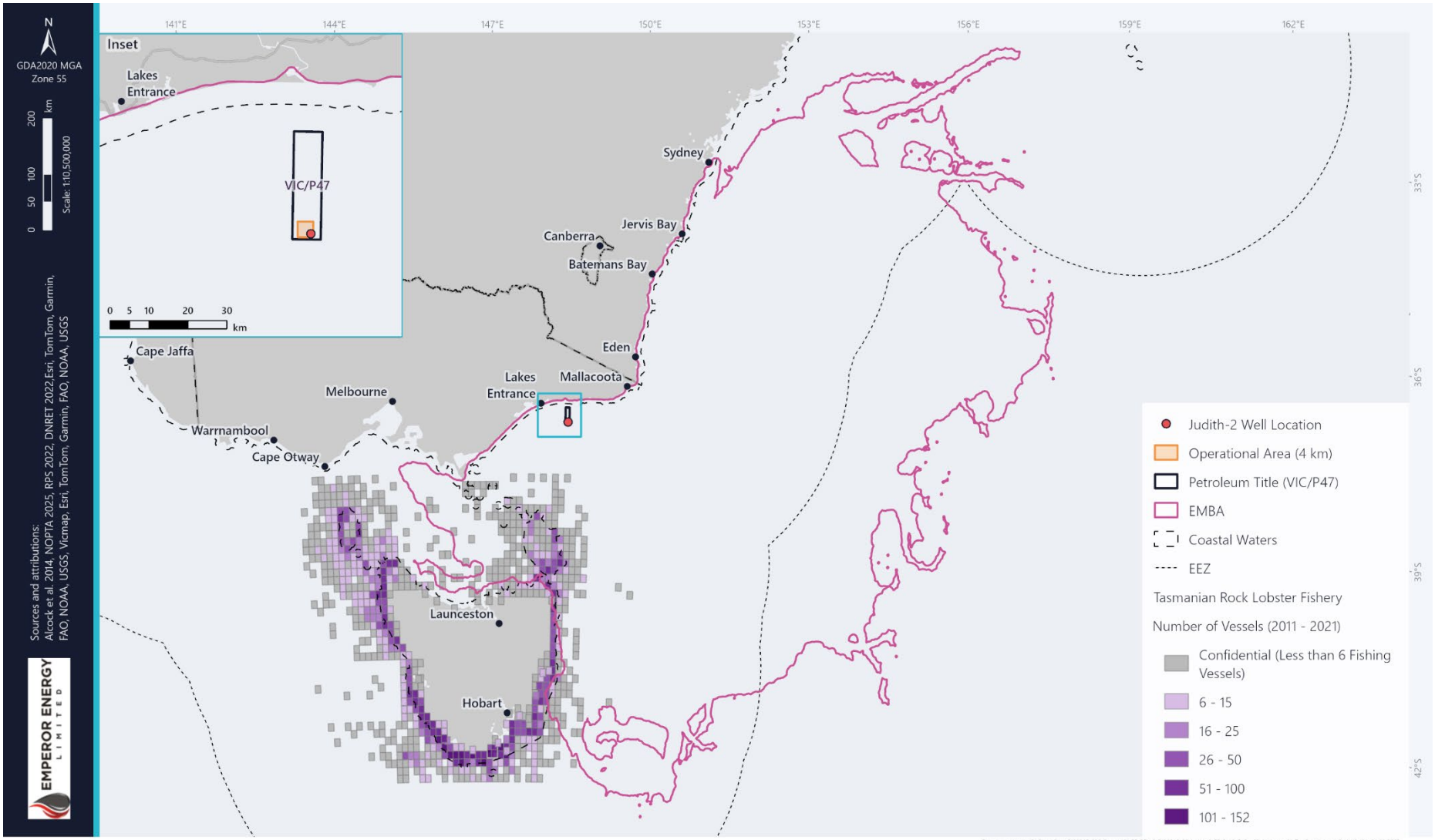


Figure 4-67: Tasmanian Rock Lobster Fishery overlap with EMBA

4.8.2.3. New South Wales

NSW state fisheries are managed by the Department of Primary Industries (DPI) under the State Fisheries Management Act 1994. DPI jurisdiction covers all waters that are within the limits of the state with additional offshore constitutional settlements for specific fisheries beyond state boundaries into Commonwealth waters.

Eight NSW-managed fisheries have management areas that intersect the EMBA (Table 4-22). Of these fisheries none have been identified to be active within the Operational Area between 2016 and 2021 with all nine known to be active within the EMBA.

Table 4-22: Description of NSW-managed Fisheries with management areas overlapping the Operational Area or EMBA

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
NSW Managed Fisheries							
Lobster fishery	Eastern rock lobster (*Sagmaraisus verreauxi*)	The fishery extends from the Queensland border to the Victorian border and includes all waters under jurisdiction of NSW to around 80 miles from the coast.	Method: Large rectangular traps Licence: 91 shareholders Season: August 1st – 31st July	Between 2019 and 2023 a total of 907 t was landed within the EMBA (Figure 4-68).	-	✓	× There is no potential for interaction in the Operational Area as the Operational Area lies outside NSW state waters.
Ocean Trap & Line fishery	Snapper (*Chrysophrys auratus*) Yellowtail kingfish (*Seriola lalandi*) Leatherjackets, Bonito (*Sarda australis*) Silver trevally (*Pseudocaranz georgianus*), Rubberlip (grey)	The fishery operates along the entire NSW coast, in continental shelf and slope waters.	Method: Variety of traps and lines with hooks Licence: 211 active businesses Season: Year-round	Between 2019 and 2023 a total of 5,884.7 t was landed within the EMBA (Figure 4-69).	-	✓	× There is no potential for interaction in the Operational Area as the Operational Area lies outside NSW state waters.

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
	morwong (*Nemadactylus douglasii*) Blue-eye trevalla (*Hyperoglyphe antarctica*) Sharks Bar cod (*Epinephelus ergastularius* Yellowfin bream (*Acanthopagrus australis*) Spanner crabs (*Ranina ranina*).						
Ocean Trawl fishery	Stout whiting (*Sillago robusta*) Red spot whiting (*Sillago flindersi*) Eastern king prawn (*Melicertus plebejus*) Eastern school prawn (*Metapenaeus macleayi*)	There are two sectors to the fishery: the prawn trawl sector and the fish trawl sector which operate along the entire NSW coast, in continental shelf and slope waters.	Method: Otter trawl net Licence: 96 active businesses Season: Year-round	Between 2019 and 2023 a total of 11,606.4 t was landed within the EMBA (Figure 4-70).	-	✓	✗ There is no potential for interaction in the Operational Area as the Operational Area lies outside NSW state waters.

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
	Royal red prawn (*Hailporpides sibogae*) Tiger flathead (*Platycephalus richardsoni*) Silver trevally (*Pseudocaranz georgianus*) Various species of sharks and rays, squid and octopus.						
Abalone fishery	Blacklip abalone (*Haliotis rubra*)	The fishery operates along the entire NSW coast between QLD and VIC	Method: hand collection Licence: 28 active businesses Season: Year-round	Between 2019 and 2023 a total of 6,223 t was landed within the EMBA (Figure 4-71).	-	✓	✗ There is no potential for interaction in the Operational Area as the Operational Area lies outside NSW state waters.
Estuary General fishery	Sea mullet (*Mugil cephalus*), Luderick (*Girella tricuspidata*),	The fishery operates along the entire NSW coast and is	Method: Multi-method Licence: 600 fishing businesses	Between 2019 and 2023 a total of 13,827,733.5 t was landed within the EMBA (Figure 4-72).	-	✓	✗ There is no potential for interaction in the

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
	Yellowfin bream (*Acanthopagrus australis*), School prawn (*Metapenaeus macleayi*), Blue swimmer crab (*Portunus pelagicus*), Dusky flathead (*Platycephalus fuscus*), Sand whiting (*Sillago ciliata*), Pipi (*Donax deltoides*), Mud crab (*Scylla serrata*) and Silver biddy (*Gerres subfasciatus*)	divided into seven regions	Season: Year-round				Operational Area as the Operational Area lies outside NSW state waters.
Estuary Prawn Trawl	School prawns and eastern prawns	The fishery operates in three main estuaries in NSW, the Clarence,	Method: otter trawl nets Licence: capped at 309 active licences	Between 2019 and 2013 a total of 2,208.5 t was landed within the EMBA (Figure 4-73).	-	✓	✗ There is no potential for interaction in the Operational Area as the

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
		Hawkesbury, and the Hunter River	Season: October-May				Operational Area lies outside NSW state waters.
Ocean Hauling fishery	Pilchards (*Sardinops sagax*), Sea mullet (*Mugil cephalus*), Australian salmon (*Arripis trutta*), Blue mackerel (*Scomber australasicus*), Yellowtail Scad (*Trachurus novaezelandiae*) and Yellowfin bream (*Acanthopagrus australis*)	The fishery operates in NSW state waters within 3 nm of the NSW coast	Method: commercial hauling and purse seine nets Licence: 69 active businesses Season: Year-round	Between 2019 and 2023 a total of 13,879,372.1 t was landed within the EMBA (Figure 4-74).	-	✓	✗ There is no potential for interaction in the Operational Area as the Operational Area lies outside NSW state waters.
Sea urchin and turban shell fishery	Black sea urchin (*Centrostephanus rodgersii*), Purple sea urchin (*Heliocidaris erythrogramma*), Red sea urchin (*Heliocidaris*	The fishery operates along the coast of NSW and is divided into five regions each with their own catch limits	Method: Hand collected Licence: 37 fishing businesses Season: Year-round	Between 2019 and 2023 a total of 798.9 t was landed within the EMBA (Figure 4-75).	-	✓	✗ There is no potential for interaction in the Operational Area as the Operational Area

FISHERY	KEY TARGET / INDICATOR SPECIES	LICENCE AREA DESCRIPTION	FISHERY DESCRIPTION	SUMMARY OF MOST RECENT FISHING ACTIVITY	MANAGEMENT AREA OVERLAP		POTENTIAL FOR INTERACTION IN THE OPERATIONAL AREA
					OPERATIONAL AREA	EMBA	
	tuberculate) and a variety of turban shells (*Turbo torquatus, Turbo militaris* and *Turbo undulatus*)						lies outside NSW state waters.
S37 Permit	Includes: -collection of marine vegetation -aquarium collection -scientific collection -oyster collection	All miscellaneous permits are managed under Section 37. The fishery can operate along the coast of NSW	N/A	Between 2019 and 2023 a total of 1,118.9 t was landed within the EMBA (Figure 4-76).	-	✓	× There is no potential for interaction in the Operational Area as the Operational Area lies outside NSW state waters.

Source: DPI 2023 (personal communications, 24 May 2023); DPI 2025

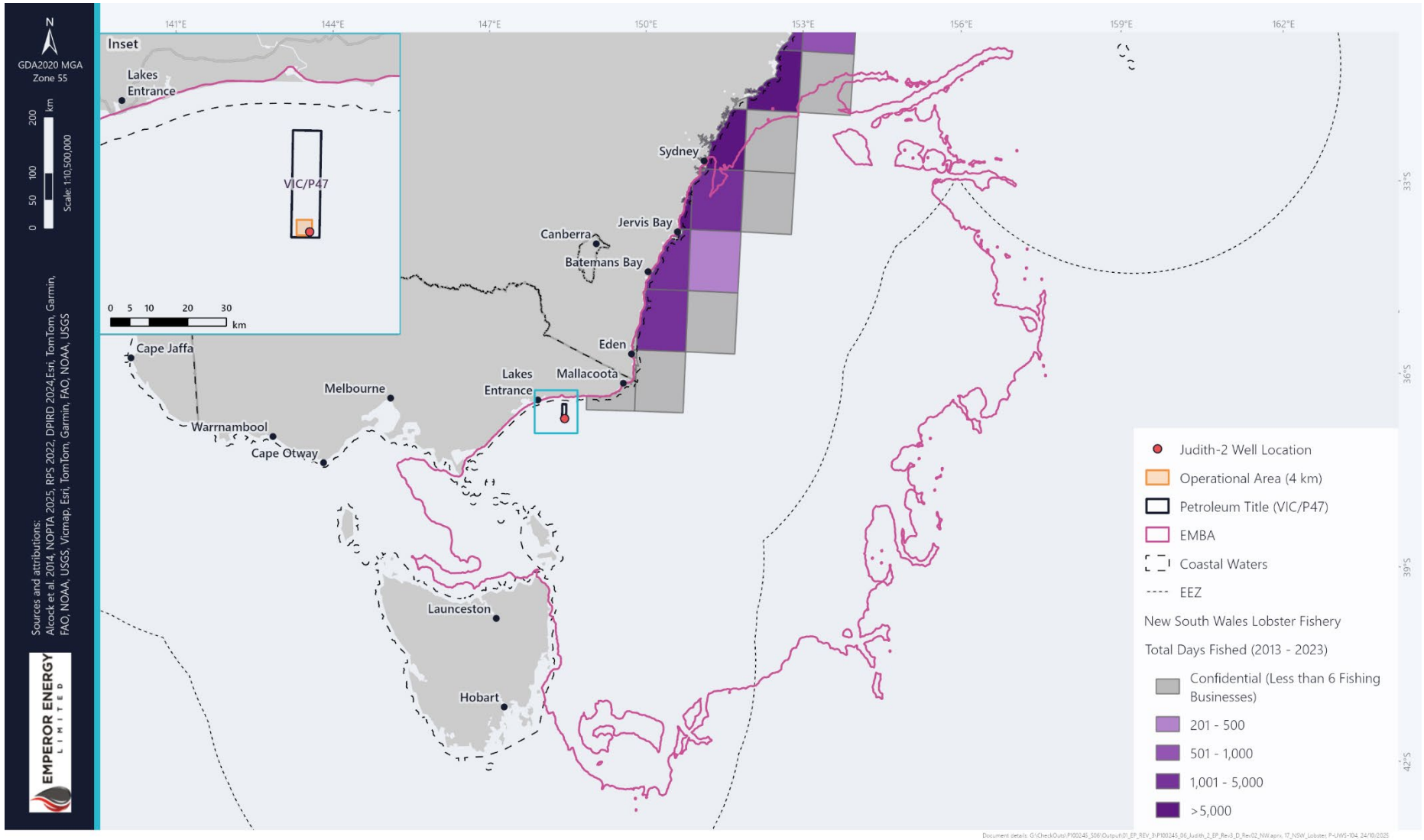


Figure 4-68: NSW Lobster Fishery and overlap with EMBA

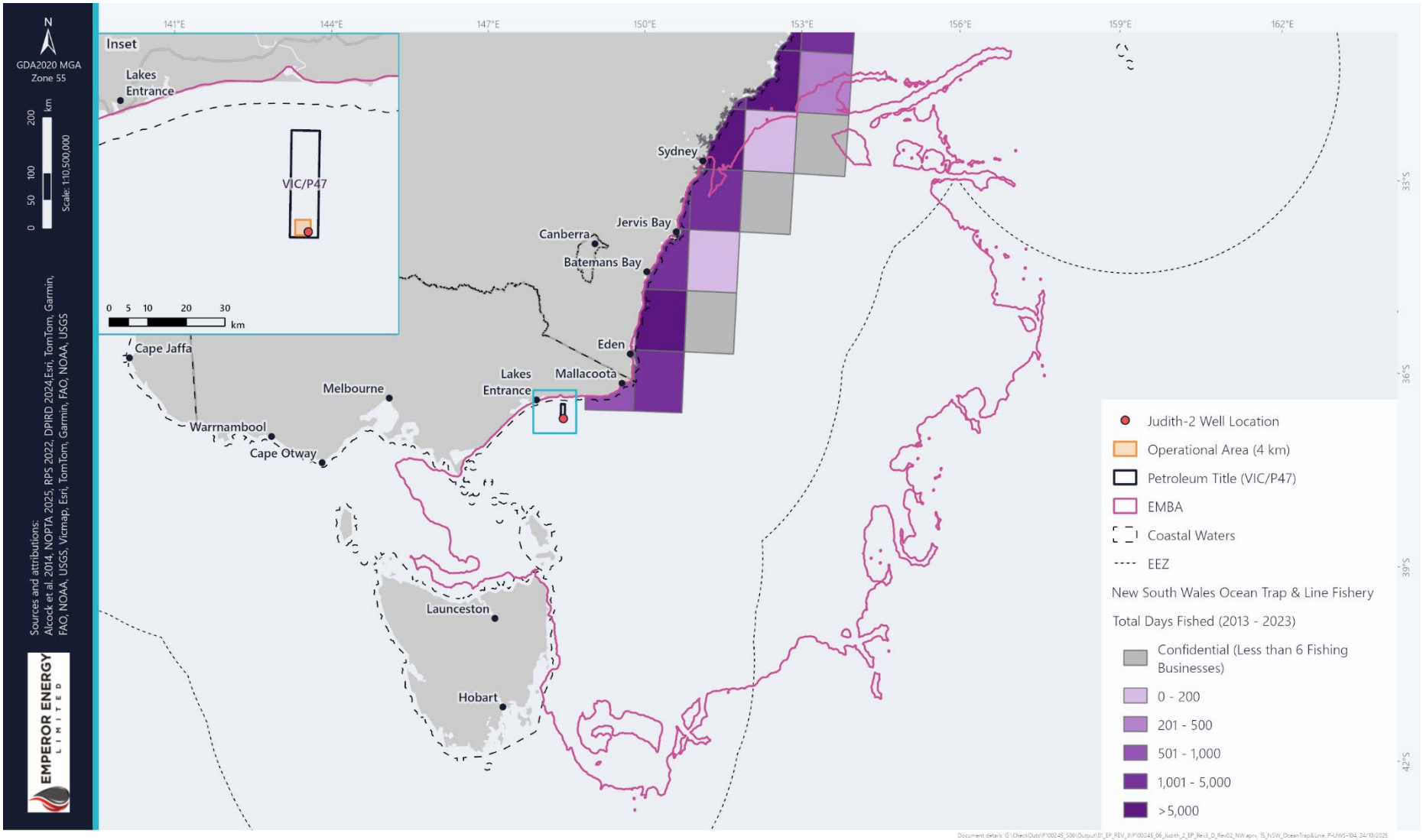


Figure 4-69: NSW Ocean Trap & Line and overlap with EMBA

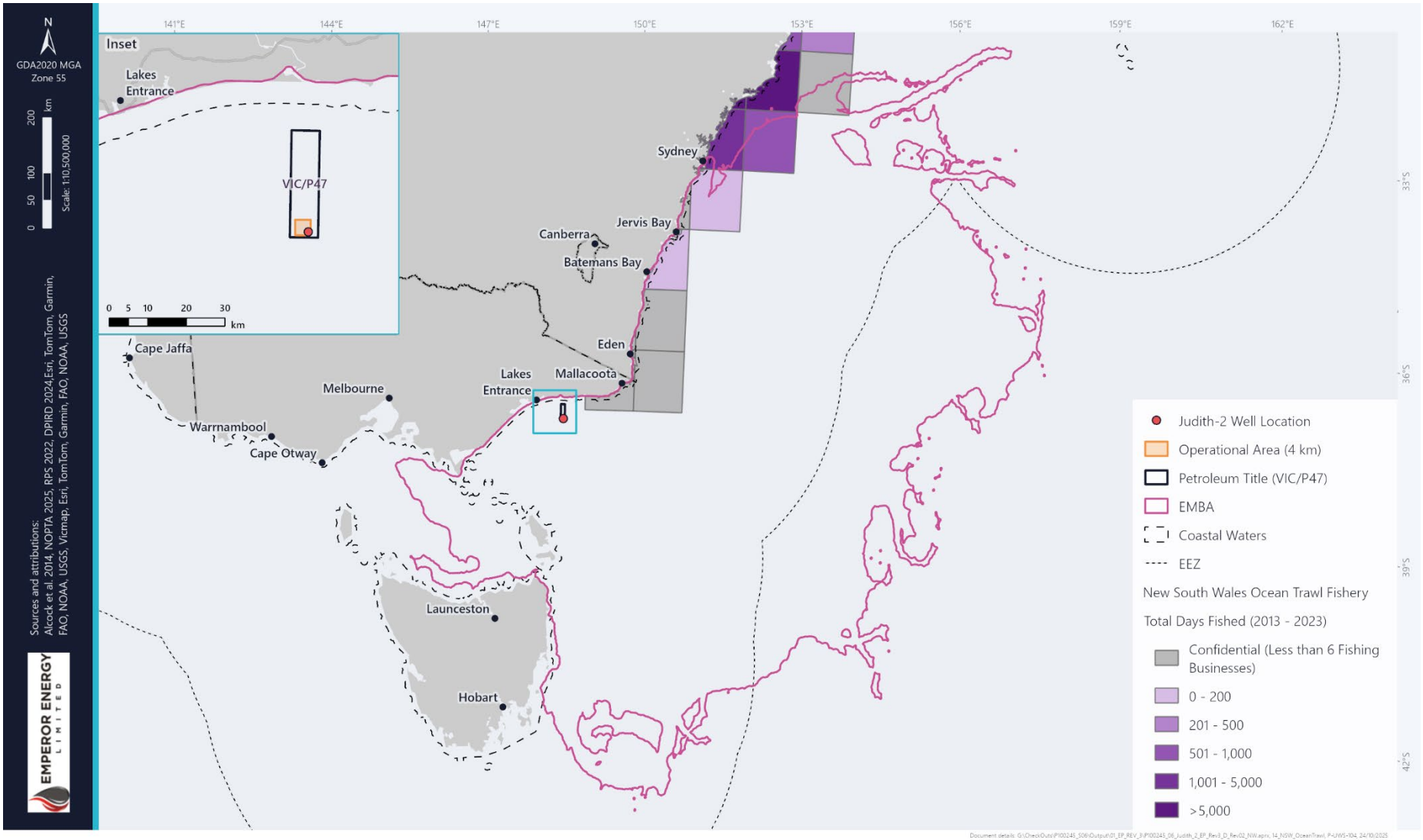


Figure 4-70: NSW Ocean Trawl Fishery and overlap with EMBA

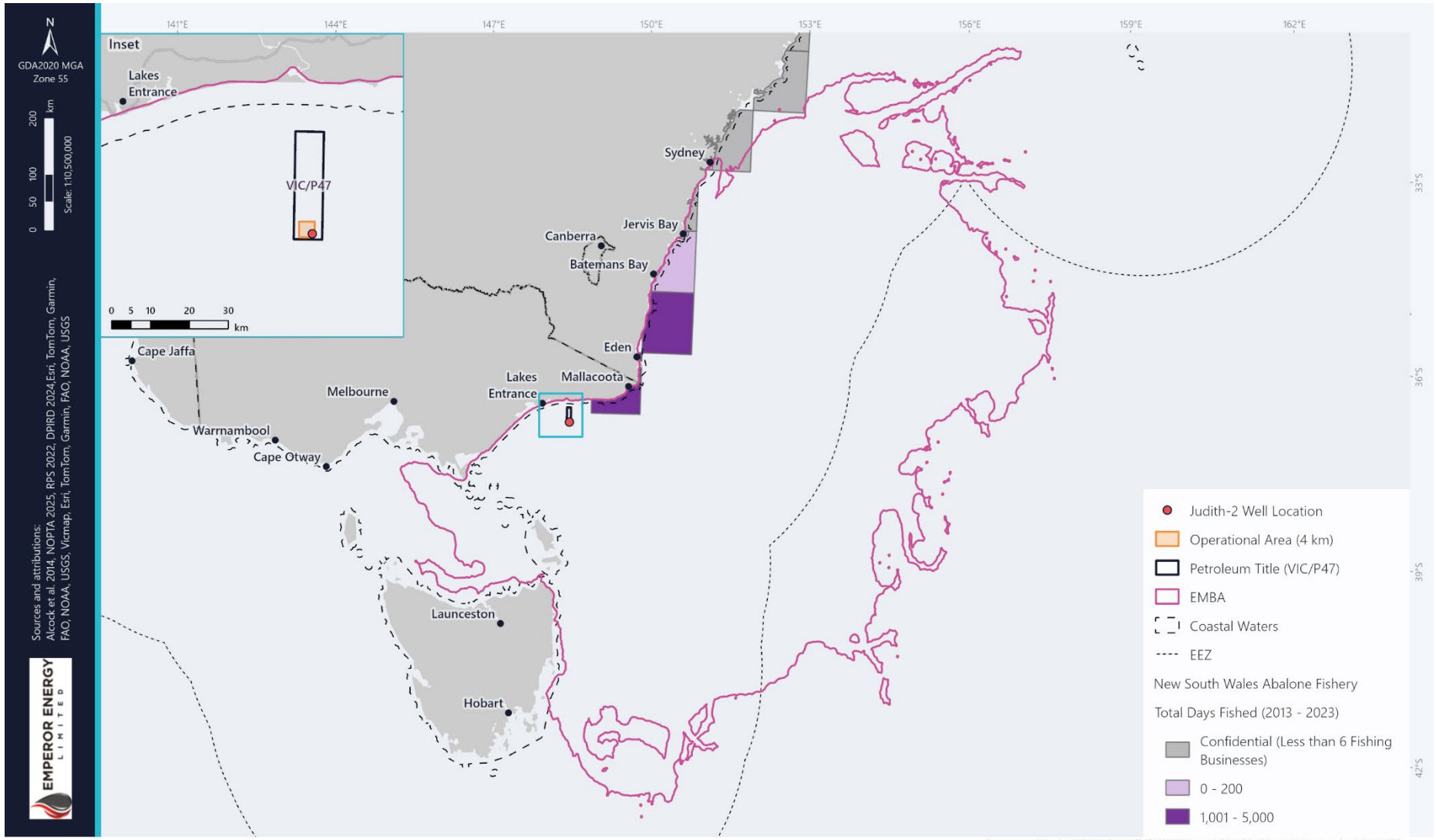


Figure 4-71: NSW Abalone Fishery and overlap with EMBA

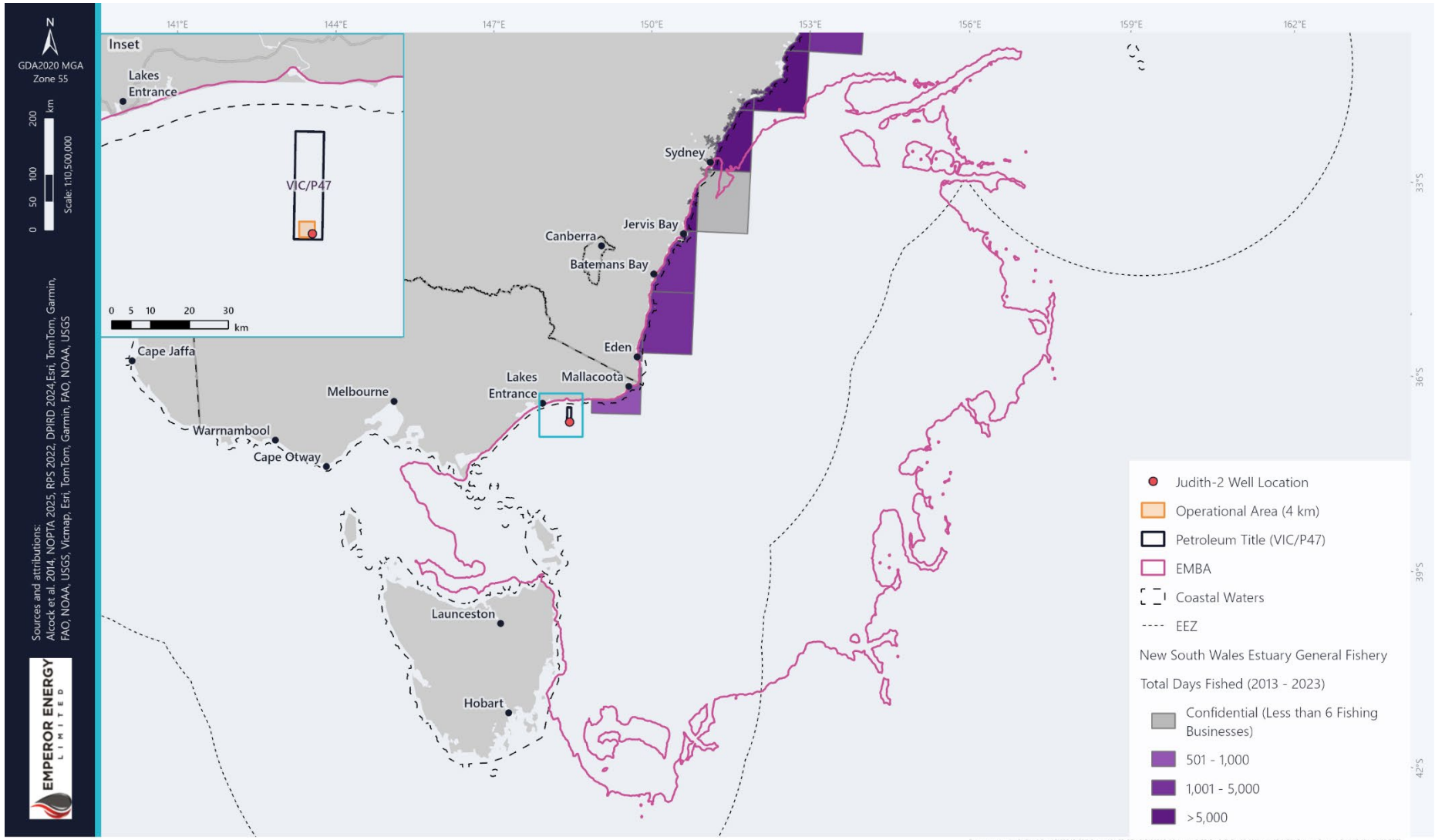


Figure 4-72: NSW Estuary General Fishery and overlap with EMBA

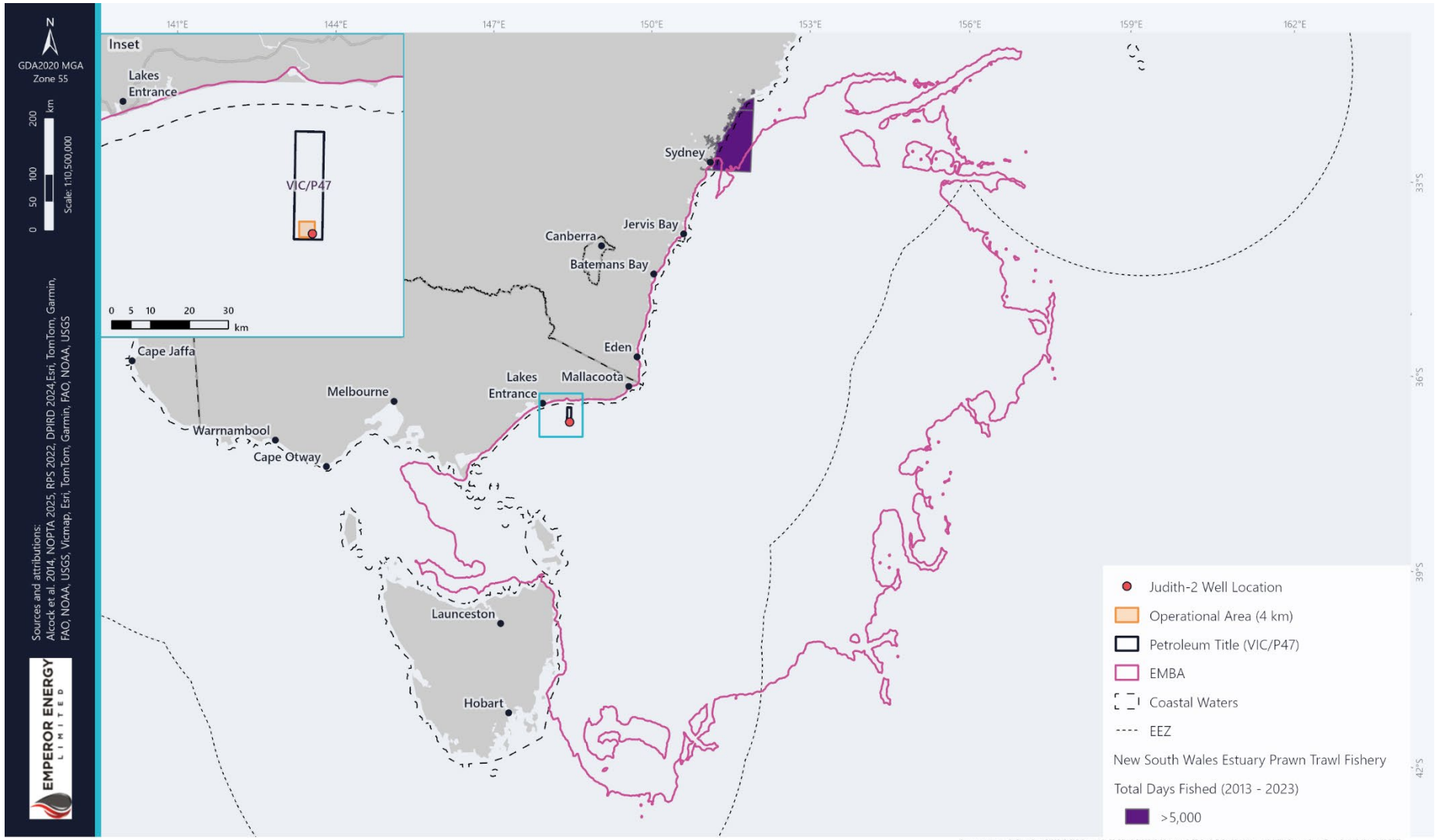


Figure 4-73 NSW Estuary Prawn Trawl Fishery and overlap with EMBA

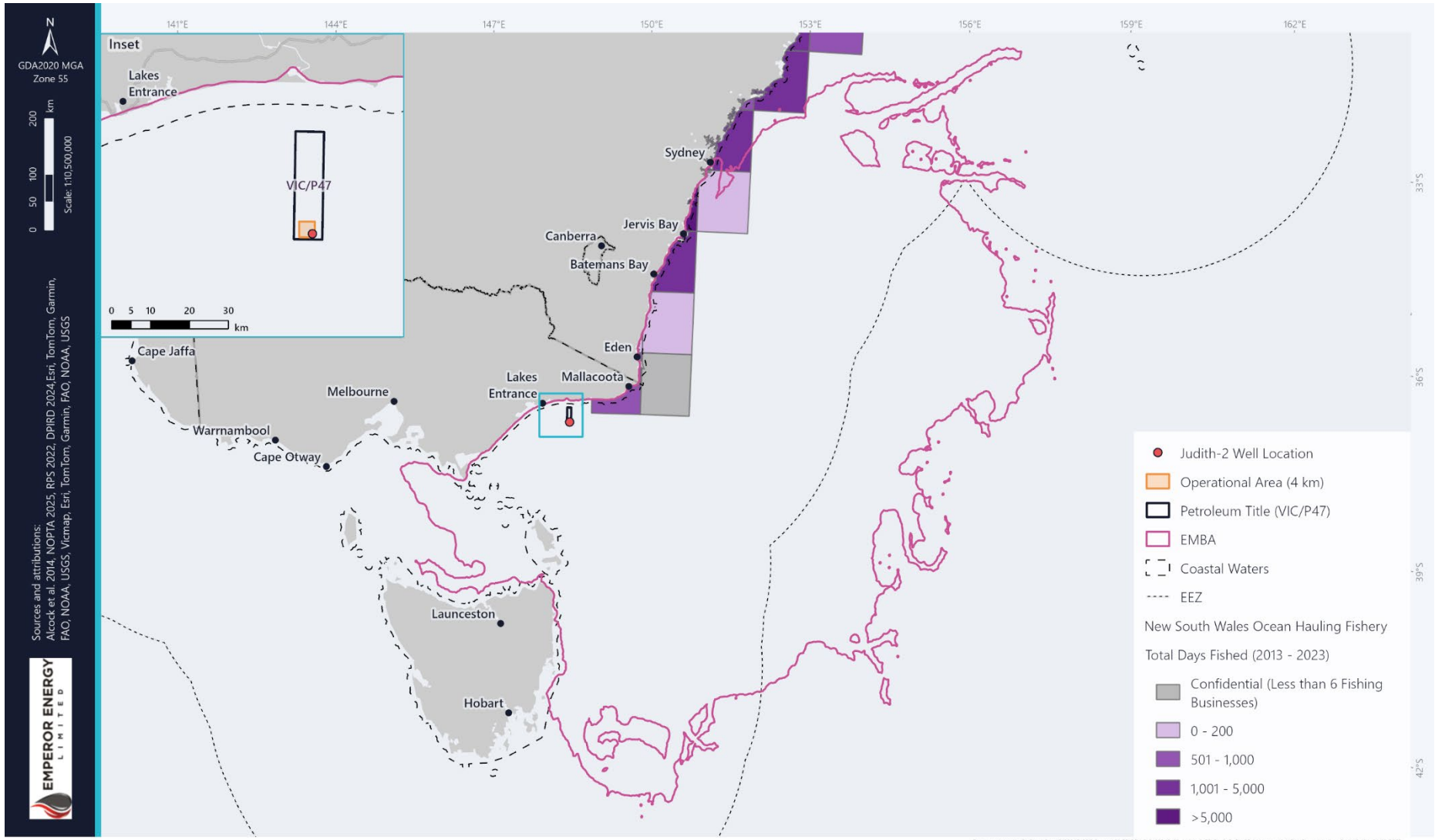


Figure 4-74: NSW Ocean Hauling Fishery and overlap with EMBA

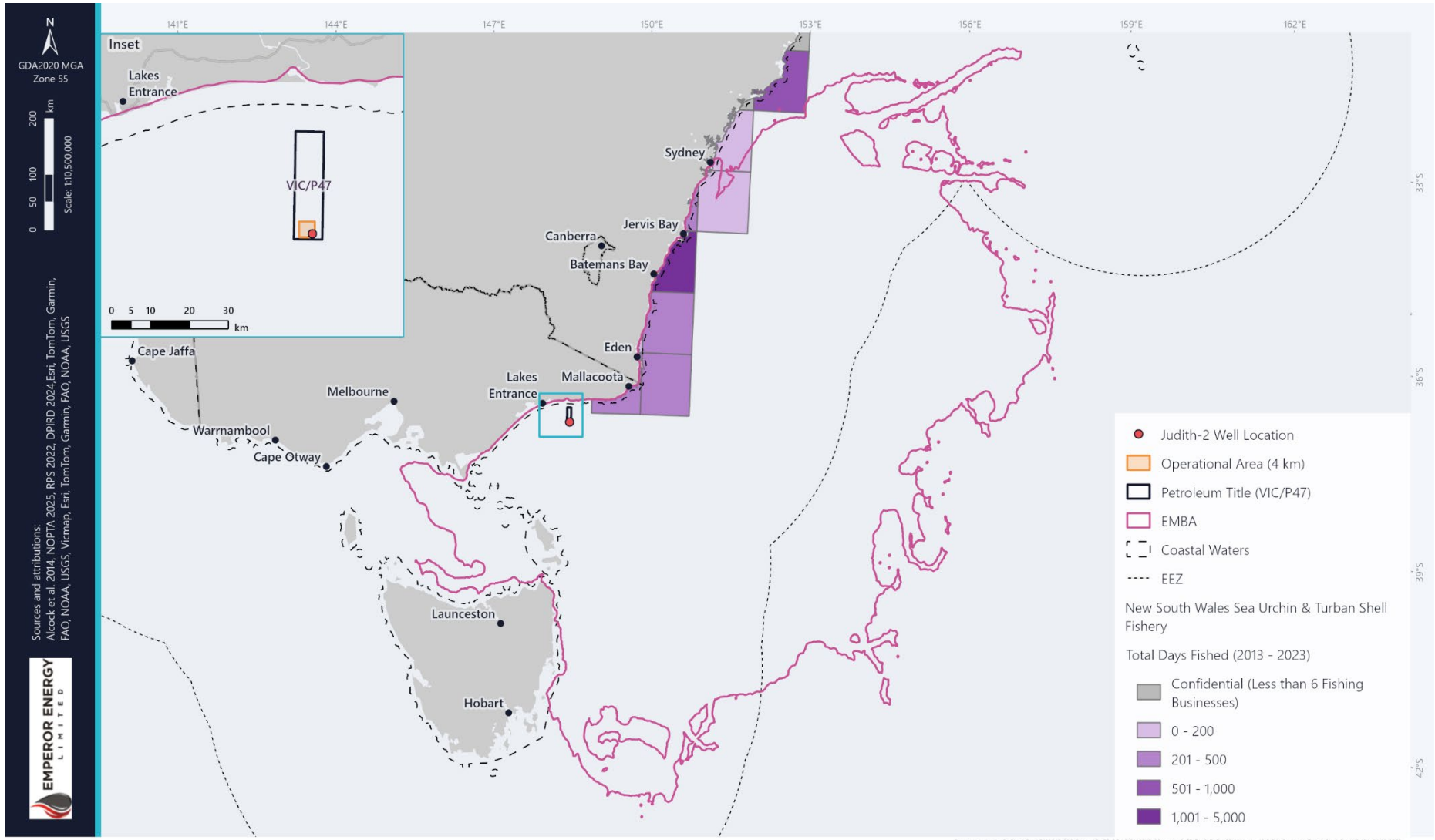


Figure 4-75: NSW Sea Urchin & Turban Shell Fishery and overlap with EMBA

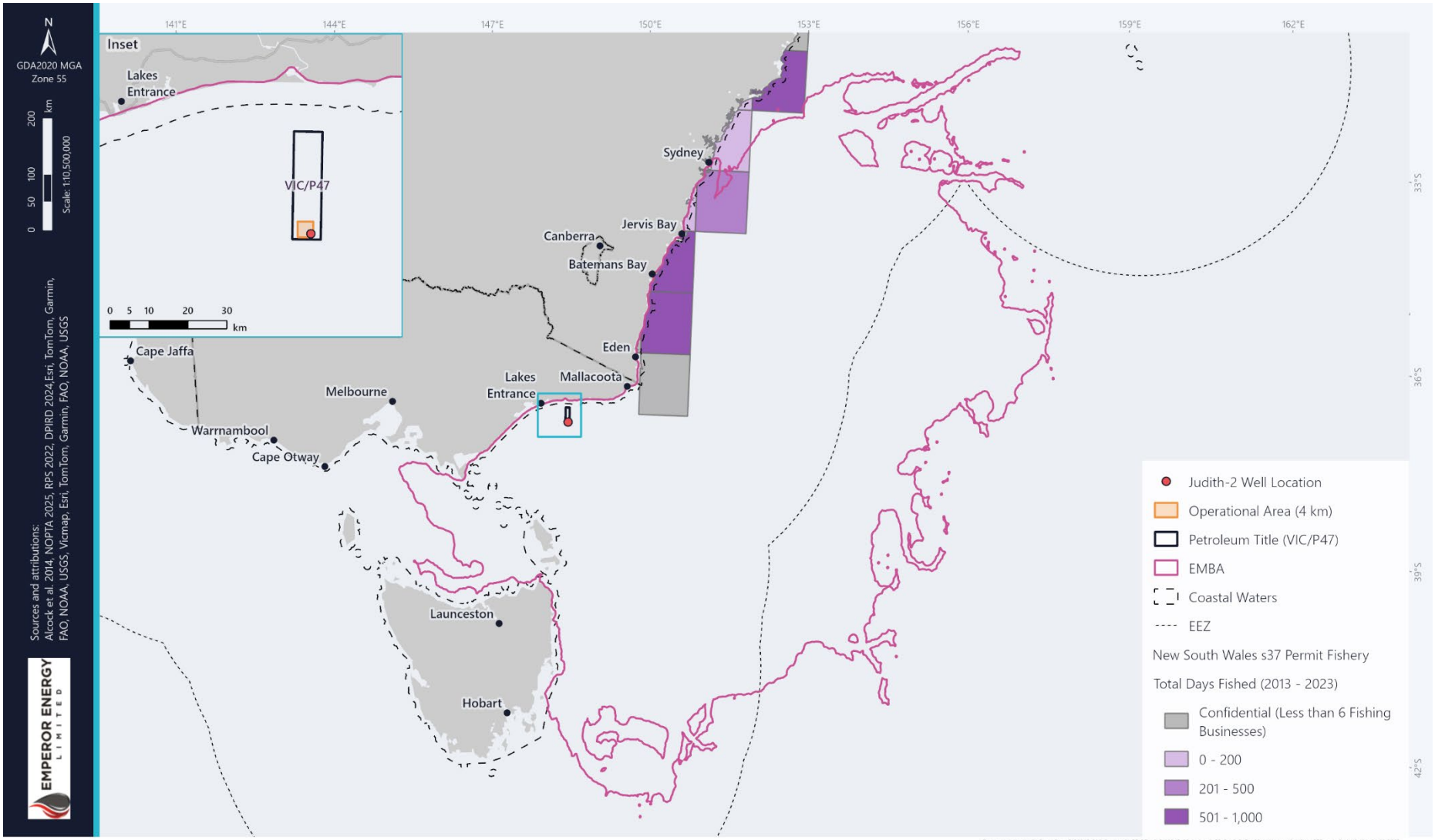


Figure 4-76: NSW s37 Permit Fishery and overlap with EMBA

4.8.3. Marine and Coastal Industry

4.8.3.1. Coastal Settlements

The closest coastal settlement to the Judith-2 Operational Area is Marlo, Victoria, situated ~36 km to the north. There are 19 Local Government Areas (LGAs) that overlap with the EMBA, which are displayed in Table 4-23.

Table 4-23: Local Government Areas that Overlap the EMBA

LGAs	Distance From Operational Area (~)
East Gippsland	35 km
Wellington	73 km
Bega Valley	140 km
Flinders (TAS)	171 km
South Gippsland	195 km
Eurobodalla	237 km
Dorset	291 km
Break O'Day	310 km
Shoalhaven	318 km
Glamorgan Spring Bay	410 km
Kiama	422 km
Shellharbour	435 km
Wollongong	450 km
Sutherland	492 km
Bayside (NSW)	512 km
Randwick -	517 km
Waverly	527 km
Woollahra	529 km
Northern Beaches	537 km

The largest NSW coastal settlements within the EMBA are describe below based on ABS (2021) census data:

- Wollongong has a population of 280,153 people and a median age of 39. Of those in the labour force, 51.7% work full-time and 32% work part-time. Professionals, Technicians and Trade Workers, and Community and Personal Service Workers are the most common occupations, making up 22.8%, 14.6%, and 13.3% of the workforce respectively. Hospitals, Other Social Assistance Services, and Aged Care Residential Services are the biggest industries, accounting for 5.1%, 3.2%, and 2.8% of employment.
- Kiama has a population of 14,761 people and a median age of 48. Of those in the labour force, 52% work full-time and 35.6% work part-time. Professionals, Technicians and Trades Workers, and Managers are the most common occupations, making up 28.9%, 14.7%, and 14.6% of the workforce respectively.

Hospitals, Primary Education, and Local Government Administration are the biggest industries, accounting for 5%, 3.7%, and 3.2% of employment.

- Batemans Bay has a population of 17,524 people and a median age of 53. Of those in the labour force, 47.7% work full-time and 39.4% work part-time. Technicians and Trade Workers, Community and Personal Service Workers, and Professionals are the most common occupations, making up 15.4%, 14.9%, and 14.6% of the workforce respectively. Aged Care Residential Services, Supermarket and Grocery Stores, and Cafes and Restaurants are the biggest industries, accounting for 5.2%, 3.9%, and 3.2% of employment.
- Ulladulla has a population of 17,026 people and a median age of 52. Of those in the labour force, 44.9% work full-time and 42.9% work part-time. Professionals, Technicians and Trade Workers, and Community and Personal Service Workers are the most common occupations, making up 17.7%, 17.3%, and 13.9% of the workforce respectively. Supermarket and Grocery Stores, Cafes and Restaurants, and Accommodation are the biggest industries, accounting for 4.2%, 4%, and 3.5% of employment.

The largest Victoria coastal settlements within the EMBA are describe below based on ABS (2021) census data.

- Mallacoota has a population of 1,118 people and a median age of 60. Of those in the labour force, 39.4% work full-time and 47.8% work part-time. Labourers, Managers, and Professionals are the most common occupations, making up 19.3%, 19.1%, and 15.6% of the workforce respectively. Accommodation, Combined Primary and Secondary Education, and Supermarket and Grocery Stores are the biggest industries, accounting for 8.3%, 8%, and 6.1% of employment.
- Lake Tyers Beach has a population of 661 people and a median age of 52. Of those in the labour force, 49.5% work full-time and 39% work part-time. Technicians and Trades Workers, Professionals, and Community and Personal Service Workers are the most common occupations, making up 17.9%, 15.1%, and 15.1% of the workforce respectively. Primary Education, Accommodation, and Electrical Services are the biggest industries, accounting for 6.2%, 5.5%, and 4.5% of employment.
- Lakes Entrance has a population of 6,527 people and a median age of 55. Of those in the labour force, 43% work full-time and 41.7% work part-time. Community and Personal Service Workers, Labourers, and Professionals are the most common occupations, making up 16.3%, 15.5%, and 13.9% of the workforce respectively. Accommodation, Supermarket and Grocery Stores, and Primary Education are the biggest industries, accounting for 6.4%, 4%, and 4% of employment.

The largest Tasmanian coastal settlements within the EMBA are describe below based on ABS (2021) census data.

- Whitemark has a population of 308 people and a median age of 58. Of those in the labour force, 45.1% work full-time and 41.2% work part-time. Labourers, Managers, and Technicians and Trade Workers are the most common occupations, making up 19.3%, 17.3%, and 14.7% of the workforce respectively. Local Government Administration, Secondary Education, and Hospitals (except Psychiatric Hospitals) are the biggest industries, accounting for 9.3%, 8.7%, and 8.7% of employment.

4.8.3.2. Shipping

The south-eastern coast of Australia is one of the countries busiest in terms of shipping activity and volumes. Commercial vessels travel along the southern Australia routes when transiting between ports on the east, south and west coasts of Australia. There are regular passenger and cargo services between mainland Australia and Tasmania. There are no main commercial shipping routes located within the Operational Area, however there is high vessel activity within the EMBA, particularly along the NSW coastline (Figure 4-77).

Two main ports, Port Kembla and Port Botany, are located within the EMBA. These ports provide essential services such as automotive vehicle imports and household goods which are supplied to Sydney residents. Other minor ports occur closer to the Operational Area, in Victoria, include the Port of Gippsland Lakes and the Port of Snowy River. These ports support commercial and recreational fishing industries as well as the tourism industry

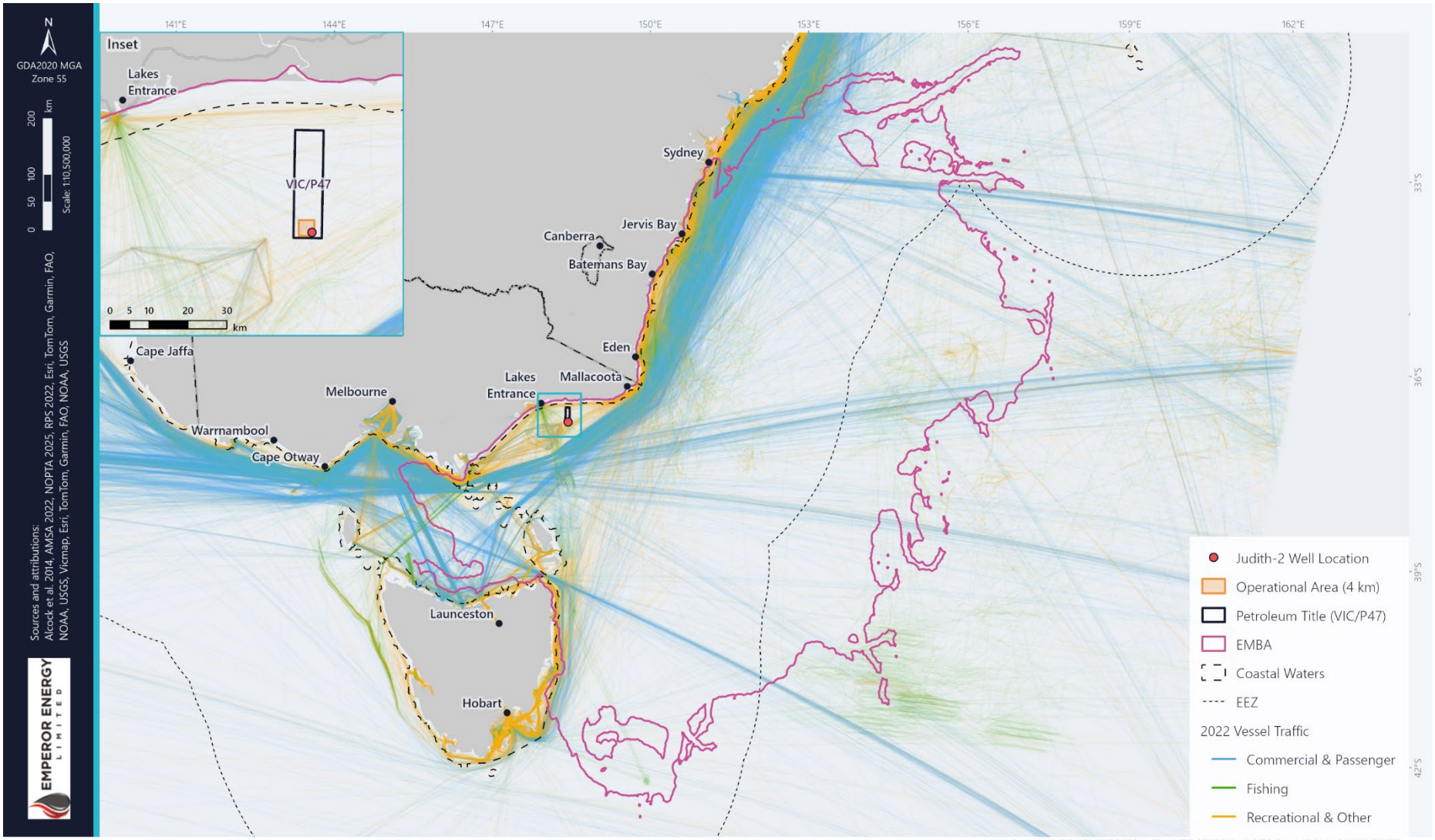


Figure 4-77: Commercial shipping activity within the EMBA

4.8.3.3. Offshore Energy Infrastructure

Oil and Gas

Victoria's petroleum (oil and gas) exploration and production is concentrated in the offshore Commonwealth waters of the Gippsland, Bass and Otway Basins, with a high density of oil and gas infrastructure located in the Gippsland Basin as displayed in Figure 4-78. These include proposed developments and current infrastructure owned and operated by titleholders including Amplitude (Cooper) Energy Limited, Beach Energy, GB Energy, SGH Energy and Esso Australia Pty Ltd (as operator of the Gippsland Basin JV).

Petroleum infrastructure in Gippsland Basin is well developed, with a network of pipelines transporting hydrocarbons produced offshore to onshore petroleum processing facilities at Longford and Orbost. There is currently no oil and gas infrastructure located within the Operational Area. However, there is one abandoned well (Judith-1), located in the south-east corner of the Operational Area which was drilled for exploration by The Shell Company of Australia in 1989 (NOPIMS 2023). The closest manned platform is Tuna operated by Esso Australia Pty Ltd and located 8 km southwest of the Operational Area.

Renewable Energy

The *Offshore Electricity Infrastructure Bill* was introduced in Australia in 2021 and was shortly followed (August 2022) by an announcement from the Commonwealth Government proposing six different areas for offshore renewable energy projects in Australian Commonwealth waters, which include:

- Southern Ocean, Victoria
- Gippsland, Victoria
- Bass Strait, Tasmania
- Hunter, NSW
- Illawarra, NSW
- Bunbury, WA.

The first area declared suitable for development is located offshore Victoria and covers ~15,000 km^2 in the Bass Strait Gippsland region. The area runs from the south of Wilsons Promontory to Lakes Entrance. The Australian Government granted 12 feasibility licences for offshore wind projects in the declared offshore wind area in Gippsland in 2024 (DCCEEW, 2024b).

The Operational Area overlaps the eastern border of the Part 1 declared offshore wind area in the Gippsland Basin (Figure 4-79). Licence holders within Part 1 of the declared area include (as of November 2025.:

- Navigator North Project Pty Ltd
- Iberdrola Australia OW 2 Pty Ltd (Aurora Green)
- Blue Mackerel North Pty Ltd
- Great Eastern Offshore Wind Farm project Co Pty Ltd
- Star of the South Wind Farm Pty Ltd (SOTS)

The closest offshore wind farm feasibility license (Navigator North) is approximately 35 km away from the Operational Area. This development was placed on hold by the operator in September 2025 with no survey or construction activities expected in the foreseeable future.

4.8.3.4. Defence

The south-east marine region has a rich history in the maritime defence of colonies, particularly in the second half of the nineteenth century. To this day the region is still important for a range of defence activities primarily associated with training exercises (CoA 2015). There are no practice, training or protected area located within the Operational Area. However, there are 9 restricted and prohibited defence sites and 30 UXO sites located within the EMBA (Figure 4-80). These range from sites with potential for interaction with unexploded ordnanceto areas where sea dumping has occurred

4.8.3.5. Subsea Cables

The EMBA intersects with several existing and proposed telecommunications and electricity transmission cables (Figure 4-81). These include major international telecommunication cables, including, the Gondwana Cable, Southern Cross Cable – North and South, Japan-Guam-Australia Cable, Australian Japan Cable (Northern and Southern Branches), Pipe Pacific Cable, Australia Papua New Guinea Cable, Tasman Global Access, Telstra Endeavour, and the Coral Sea Cable.

The Indigo Central cable, which connects Perth and Sydney, through southern Australia, also intersects with the EMBA. In the Bass Strait, two Telstra-operated telecommunications cables, Bass Strait-1 and Bass Strait-2 intersect the EMBA, as does the Basslink high-voltage electricity interconnector between Tasmania and Victoria.

Three new subsea cable systems are either in the planning or installation phase and intersect within the EMBA:

- East Coast Cable System between Melbourne, Sydney and Brisbane is being developed by Vocus.
- Hawaiki Nui – Hawaiki Submarine Cable between Melbourne and Sydney.
- Marinus Link undersea electricity and data cable that will connect Tasmania and Victoria.

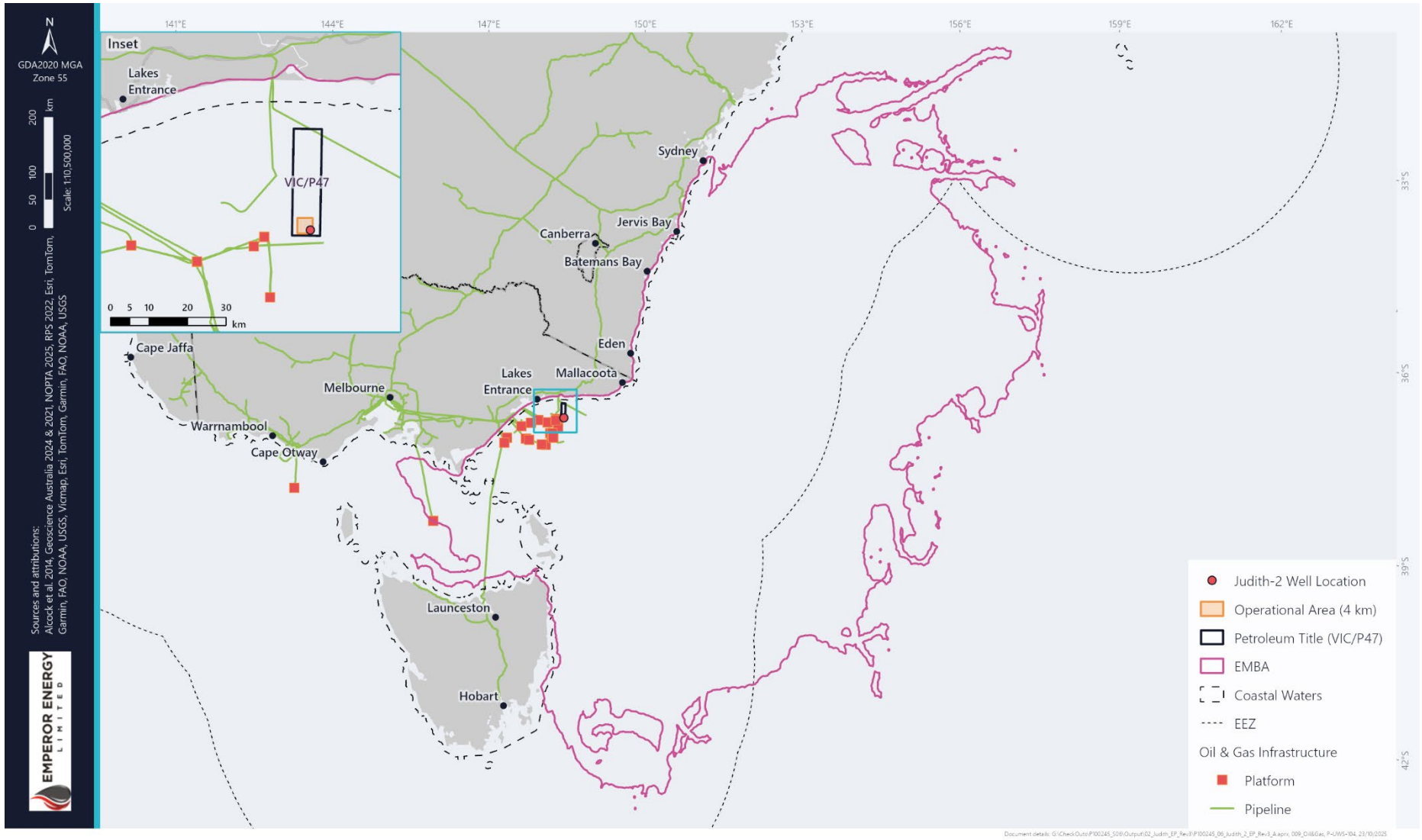


Figure 4-78: Oil and gas infrastructure within the EMBA

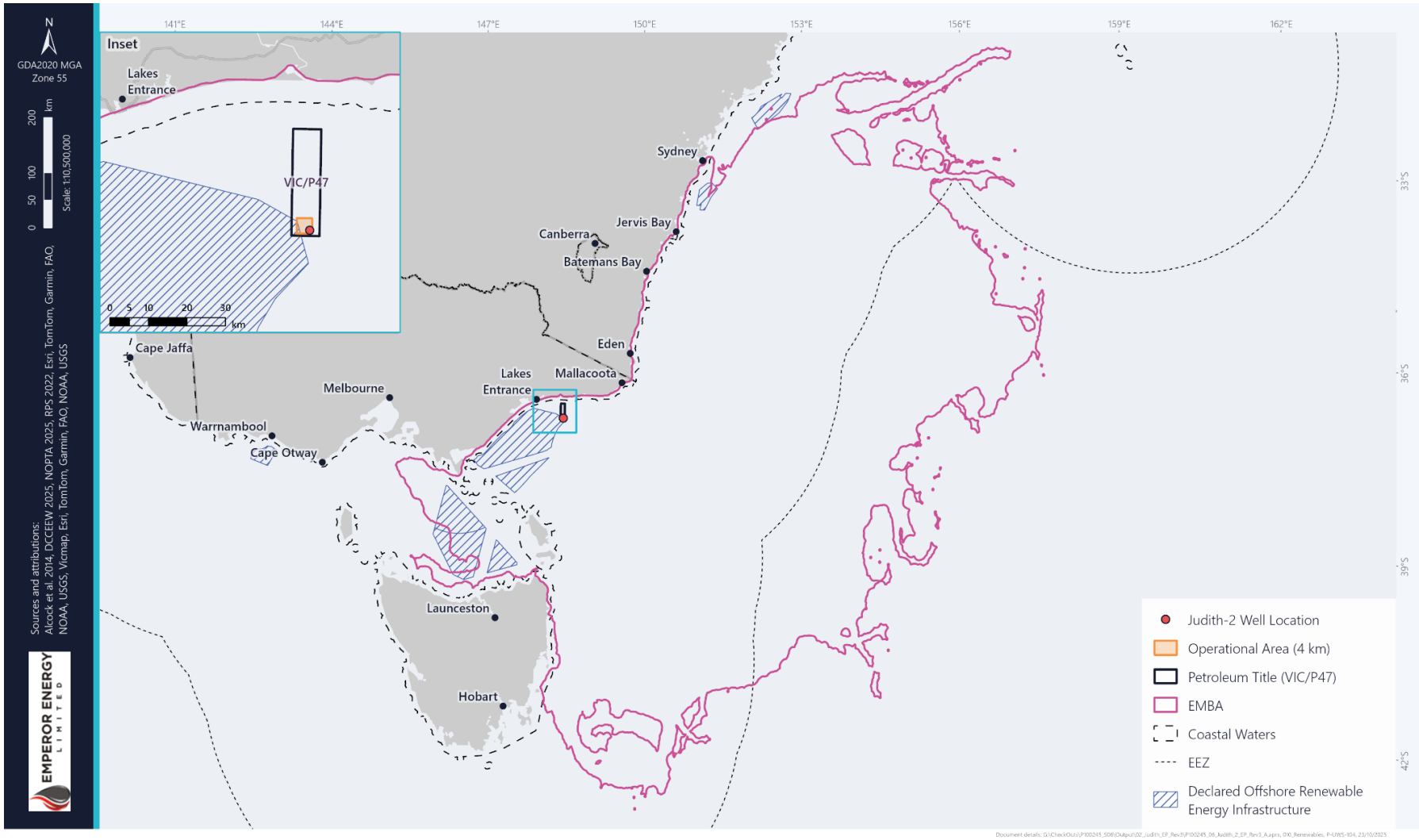


Figure 4-79: Offshore Renewable Energy Declared Areas within the EMBA

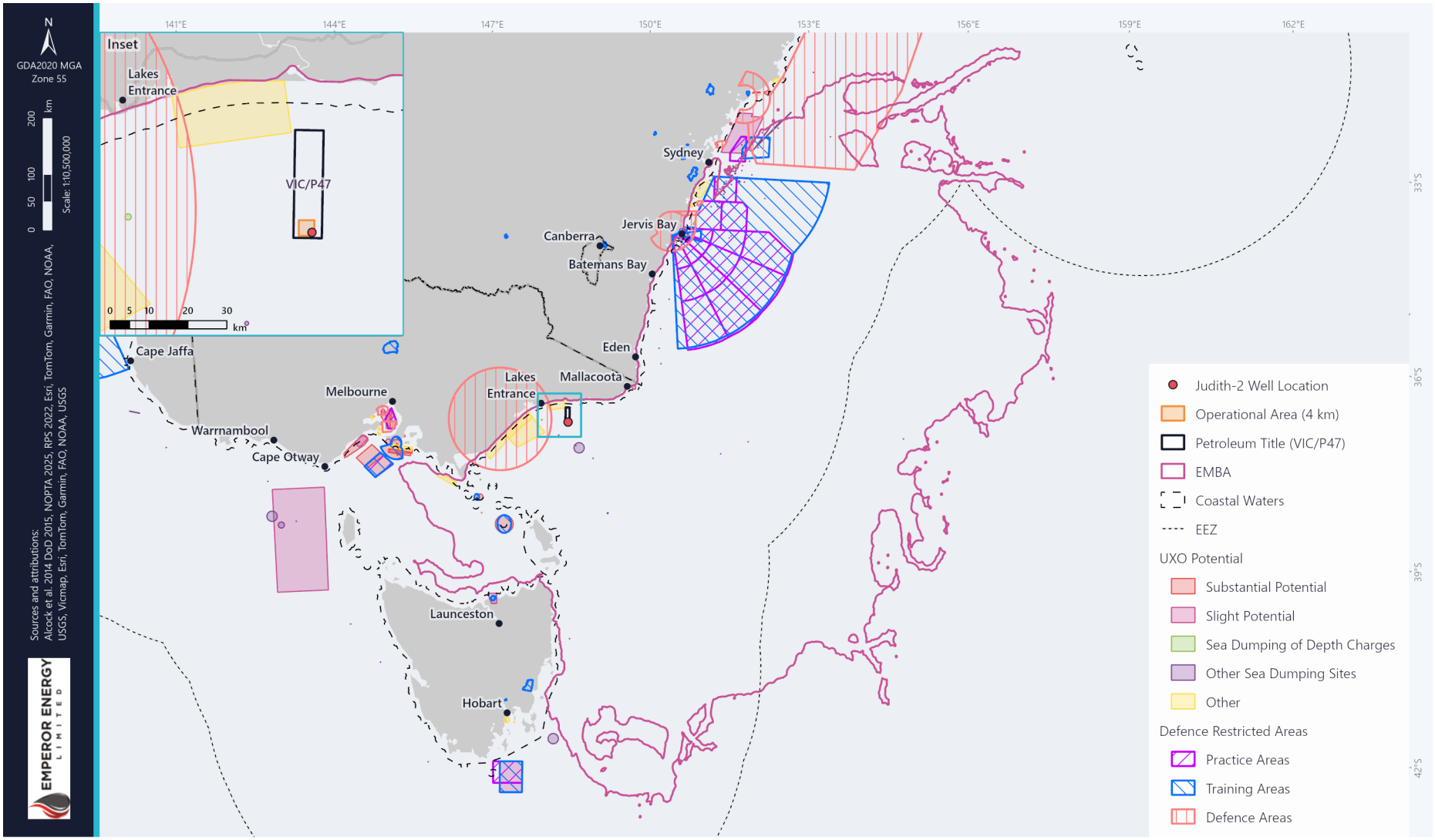


Figure 4-80: Defence activities within the EMBA

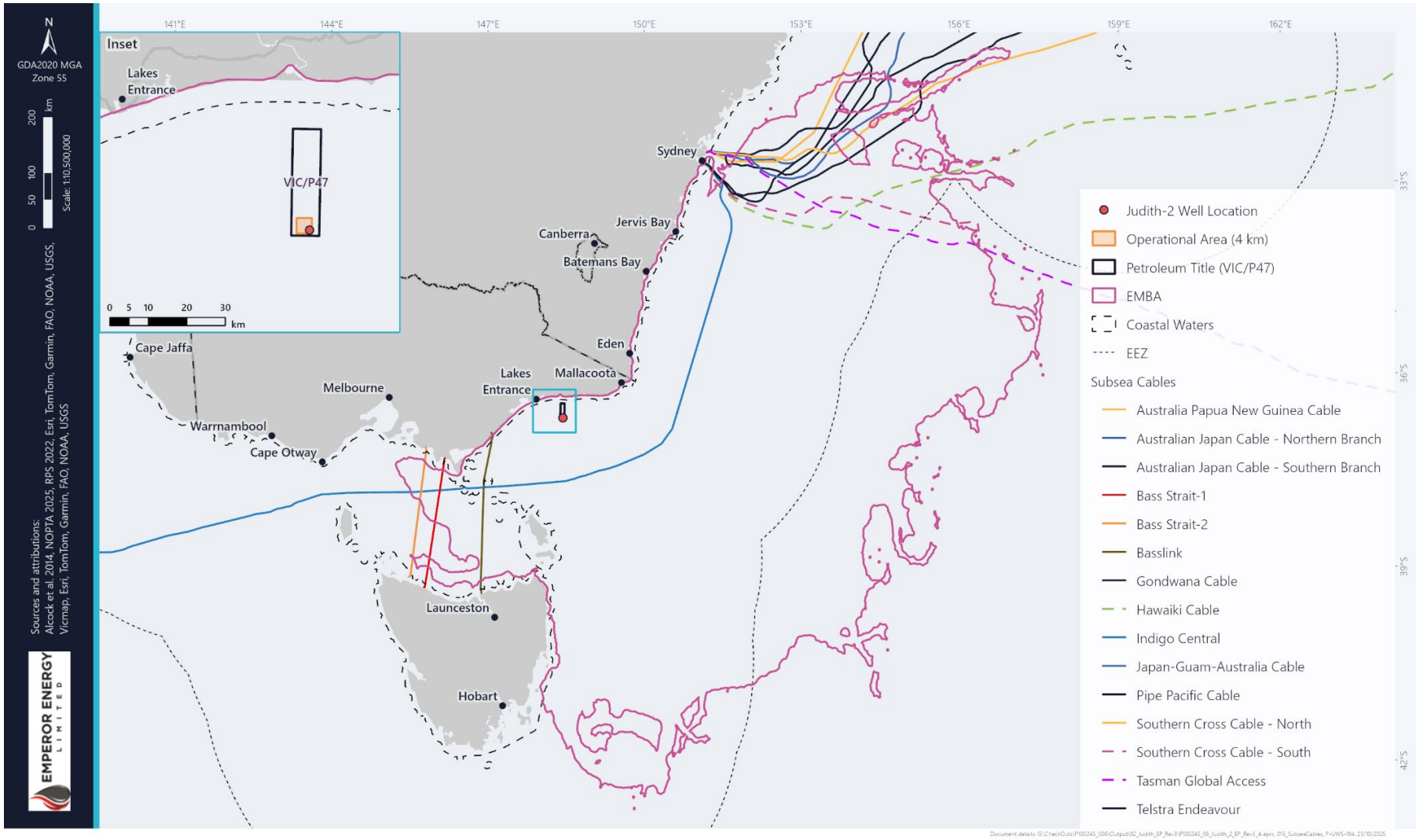


Figure 4-81: Submarine Cables within EMBA

4.8.4. Tourism and Recreation

Recreational and tourism activities are extremely valuable foundations for the local and regional economy. In 2023-2024 tourism in Victoria was estimated to be worth $36 billion to the economy in Gross State Product which increased by 13% since the 20223-2023 season and generated approximately 288,800 jobs up 8.4% from 2022-2023 (Tourism Research Australia, 2025).

The Australian coast provides a diverse range of recreation and tourism opportunities, including scuba diving, charter boat cruises, and surfing. The Gippsland region is well known for its national parks which expand across region and cover a variety of landscapes which allow for a range of activities such as hiking, skiing, swimming, and riding. In 2021 Destination Gippsland put in place a strategic plan which set a goal for the region to reach 9 million total overnight visitors and $1.3 billion in visitor expenditure by 2024. In 2022 the Gippsland region supported 5.63 million visitors which resulted in a total visitor expenditure of $1.57 billion (Destination Gippsland 2022).

In East Gippsland, primary coastal tourism locations include Marlo, Cape Conran, Ninety Mile Beach, Lakes Entrance and Mallacoota. The area is renowned for its nature-based marine tourism, recreational fishing, surfing, boating and sailing, scuba diving, and kayaking (East Gippsland, 2025). Water-based marine activities will intersect with the EMBA. However, marine-based tourism and recreation is unlikely to occur within the Operational Area given the depth of the Operational Area, lack of seabed features, and distance from the shore

Recreational Fishing

Recreational fishing is a major economic contributor in Australia, worth several billion dollars annually, and includes rock, beach, boat and estuary fishing using rod and line. Game fishing may also use specialised gear such as outriggers, gimbals and fighting belts (Game Fishing Association Australia, 2025). Most recreational fishing takes place in nearshore coastal waters and within bays and estuaries, either from shore or small inshore vessels (DAFF, 2025).

Between 2018 and 2019, an estimated 3.81 million fishing events were recorded in Victoria. Compared with other states, Victorian fishers were less likely to fish in marine environments (75.3% compared with 85.0%) and more likely to fish in freshwater environments, with 80.6% reporting freshwater fishing activity during the previous year (Moore et al., 2023).

Common recreational catches include tiger flathead, bream, snapper, Australian salmon and lobster, while offshore species often include mackerel, tuna, groper and shark. Surveys of Victorian boat ramps in 2018–2019 recorded 15,287 recreational fishing trips, with 26% targeting southern bluefin tuna.

Deep dropline fishing uses electric winches and heavy-duty rods. This fishing occurs within deeper waters e.g. over 250 m with target species including (AFMA, 2025):

- Blue-eye trevalla
- Pink ling
- Ribaldo
- Ocean perch.

Recreational and game fishing activity is expected to be minimal in the Operational Area. Deep dropline fishing occurs in water waters deeper than those found in the Operational Area e.g. over 250m (AFMA, 2025).

4.8.5. Underwater Cultural Heritage

The UCH Act covers the protection of Australians underwater cultural heritage including shipwrecks, sunken aircraft, relics as well as other forms of underwater cultural heritage. A search of the Australian Underwater Cultural Heritage Database identified no items within the Operational Area. However, over 100 items were identified within the EMBA, all of which are shipwrecks, the majority of which are considered historic (>75 years old). 19 Historic shipwrecks within 50 km of the Operational Area are listed in Table 4-24 and Figure 4-82.

Table 4-24: Shipwrecks within 50 km of the Operational Area

SHIPWRECK	YEAR	LOCATIONS
Leven Lass	1854	Bass strait, off Gippsland Coast
Talark	Unknown	58km SSE Lakes Entrance
Result	1880	Bass Strait
Favourite	1852	Bass Strait
Neptune	1889	Peral Point
General	1890	Pearl Point, East Gippsland Coast
Sydney Cove Longboat	1797	Ninety Mile Beach west of Cape Everard
Rostrevor	1919	West of Pearl Point
Albert San	1926	East Coast, Cape Conran, Beware Reef
Ridge Park	1881	Beware Reef, Cape Conran
Lady of the Lake	1880	Snowy River Entrance
Glengarry	1898	Marlo
Curlip	1919	Mouth of Snowy River at Marlo
Bogong	1896	West of the Snowy River Mouth
Wongrabell	1912	Snowy River Bar, Marlo
Falcon	1903	Snowy River Entrance, Marlo
Pomona	1866	Between Lake Tyers and Snowy River
Anne and Mary	1887	Bass Strait, off Lake Tyres
Unidentified: Lakes Entrance	1870	Eastern Beach, Lakes Entrance

Source: CoA 2023a

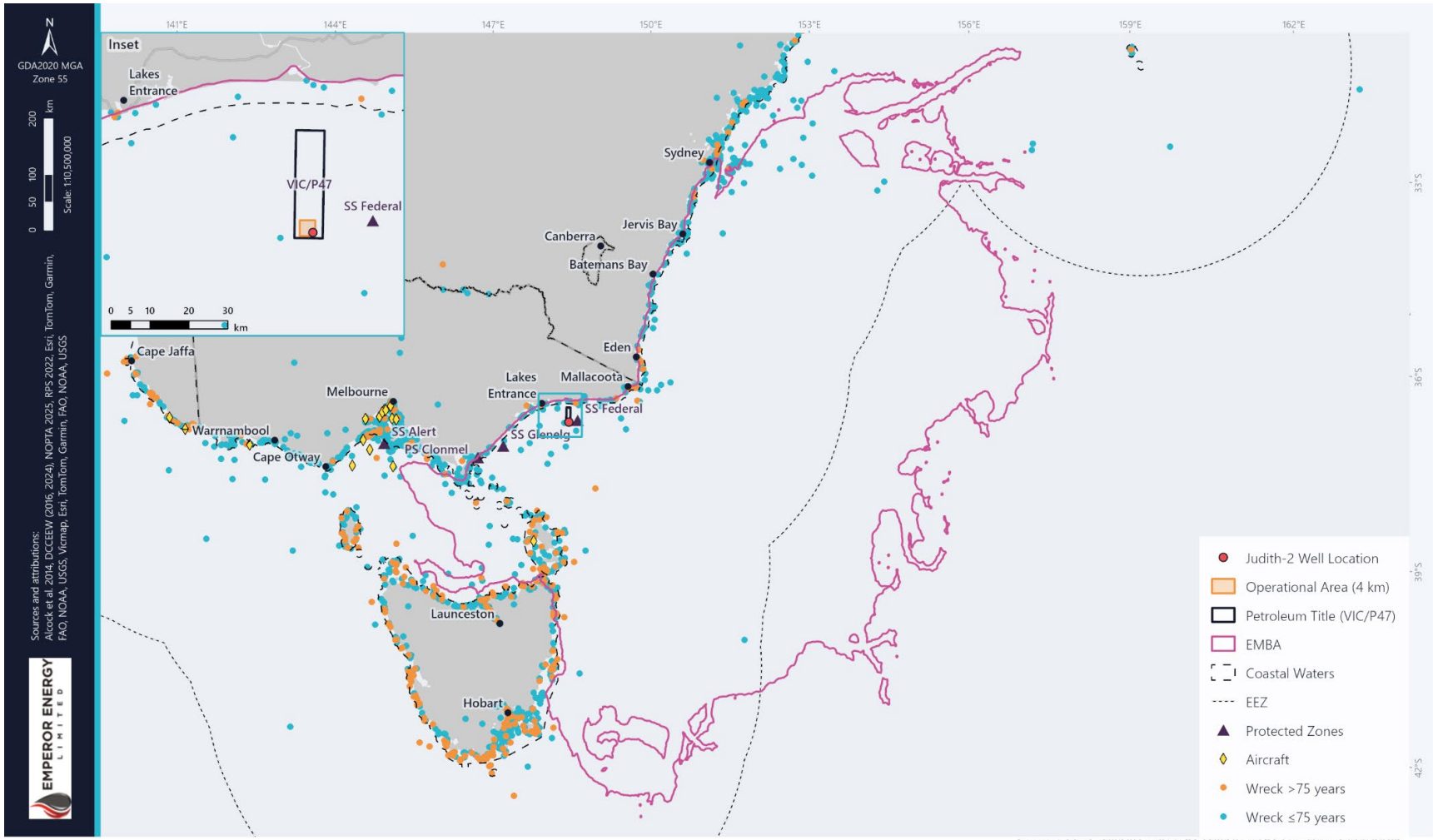


Figure 4-82: Shipwrecks within the EMBA.

4.9.First Nations Cultural Heritage

The following sections describe First Nations cultural presence, agreements, plus values and sensitivities identified through publicly available literature and stakeholder consultation (APPENDIX D) within the Operational Area and EMBA:

- Native Title (Section 4.9.2)
- Indigenous Land Use Agreements (Section 4.9.3)
- Indigenous Protected Areas (Section 4.9.4)
- First Nations people's values and sensitivities, including submerged cultural landscapes, Sea Country, culturally significant sites, knowledge systems, and culturally significant species (Section 4.9.6).

These themes reflect regional understandings of Sea Country, including cultural obligations to land and sea, oral histories describing the inundation of coastal areas, and the long-term occupation of the Gippsland region prior to sea-level rise.

4.9.1. Methodology to Identify First Nations Peoples Values and Sensitivities

The assessment of First Nations people values and sensitivities was undertaken using the following methods:

- National Native Title Tribunal Spatial Data (NNTT, 2026) to identify Native Titles, Indigenous Land Use Agreements, and the Traditional Custodians of Sea Country within the Operational Area and EMBA.
- Utilisation of the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) Code of Ethics for Aboriginal and Torres Strait Islander Research (AIATSIS, 2020) to ethically conduct research, analysis and dissemination of information and knowledge which is about or may affect First Nations people collectively or individually.
- Reviewing publicly available information, including published Sea Country plans, Healthy Country plans, research, or management plans that might identify culturally significant landscapes, species, and cultural values and sensitivities relevant to activities.
- The Victorian Aboriginal Heritage Council online map to identify Recognised Aboriginal Parties in Victoria (VAHC, 2024).
- Aboriginal Land Councils within NSW using the NSW Aboriginal Land Council Map (NSW ALC, 2026) and Tasmania Aboriginal Centre (TAC, 2026).
- Consultation with First Peoples State Relations (Victoria) [VIC-FPSR-01] (APPENDIX D)
- Consultation with First Nations groups and individuals who may reasonably be considered to have functions, interests or activities that interact with the EMBA as summarised in APPENDIX D .

Emperor Energy remains committed to ongoing engagement with First Nations people for the duration of the activity as per regulation 22(15) of the OPGGS(E) Regulations. Any new information or uncertainty that may arise will be managed in accordance with Emperor Energy's consultation strategy and Management of Change process to ensure that cultural values and sensitivities continue to be appropriately assessed and considered.

4.9.2. Native Title

The *Native Title Act* was passed by the Commonwealth Government in 1993. This act provides recognition of the rights and interests Aboriginal and Torres Strait Islander peoples have for Country and Sea Country. Native Titled were identified using the National Native Title Tribunal (NNTT, 2023). No Native Title claims, or determinations have been registered within the Operational Area. However, there are two registered Native Title claims and one Native Title determination (Figure 4-83) within the EMBA which are listed in Table 4-25.

Table 4-25: Native Title claims and determinations within the EMBA

APPLICANT	STATE	STATUS	DETAIL
South Coast People (NC2017/003)	NSW	Active	Claim covers 16,807.7 km^2 of the southern NSW coast from Eden to Sydney Claim was accepted for registration (01/2018)
Gunaikurnai People (VCD2010/001)	VIC	Determined	Determination covers 13,842 km^2 of the eastern Victorian coastline in the Gippsland region. The native title was granted in 2010 Includes 200 m offshore along the coastline
Boonwurrung People (VC2020/001)	VIC	Active	Claim covers 13,077.8 km^2 of the southern coast of Victoria, generally in the coastal district of Melbourne, including Wilson's Promontory Claim was denied registration (07/2020) Claim was sent for reconsideration and denied again (03/2021)

There are no registered claims or determinations in Tasmania

Source: NNTT 2026

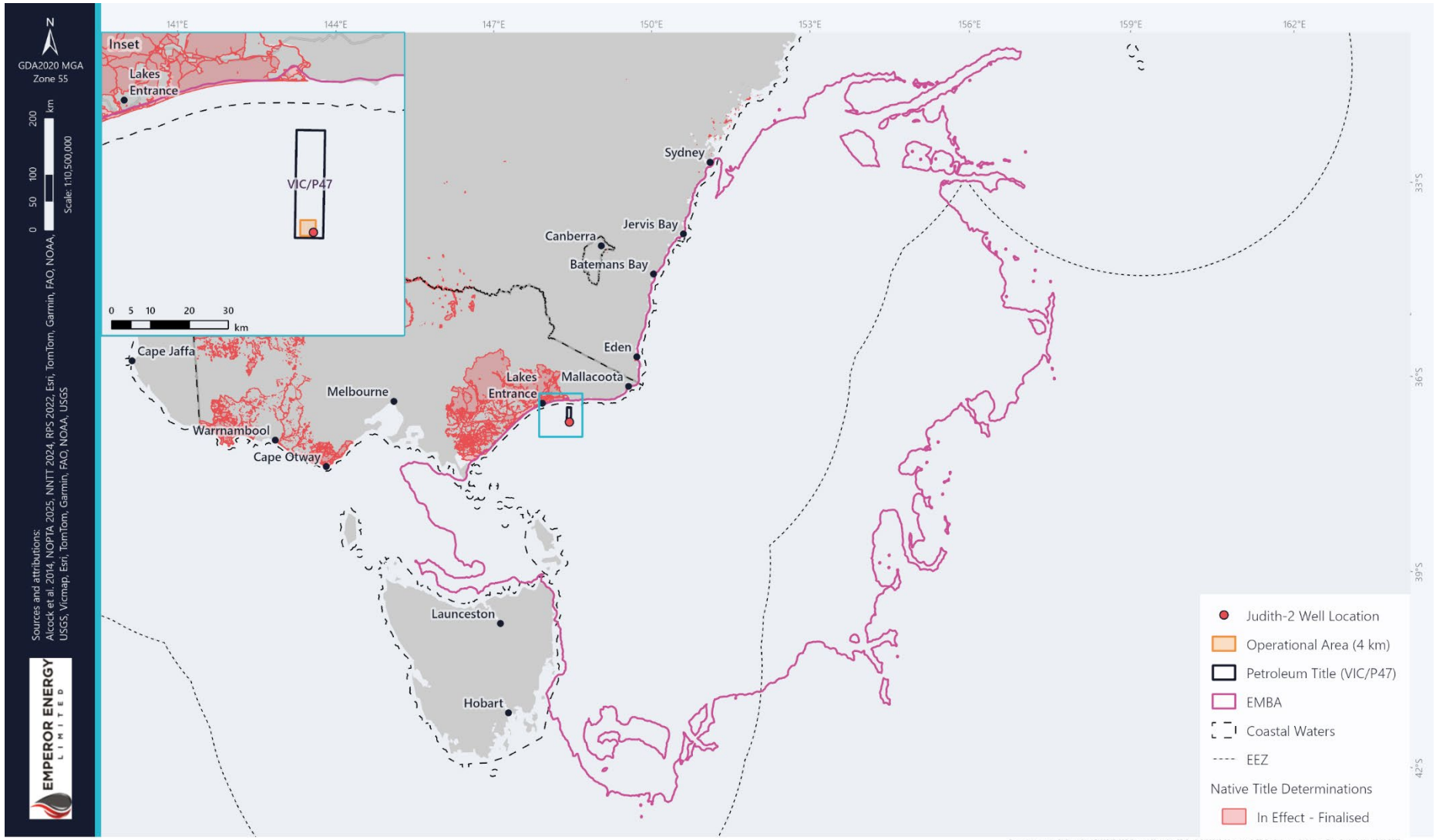


Figure 4-83: Native Title Determinations within the EMBA

4.9.3. Indigenous Land Use Agreements

Indigenous Land Use Agreements (ILUAs) are voluntary agreements between native title parties and other bodies about the use and management of areas of land and/or waters. No ILUAs have been registered within the Operational Area. However, there are three registered ILUAs within the EMBA, which are listed in Table 4-26.

Table 4-26: Indigenous Land Use Agreements within the EMBA

NAME	STATE	STATUS	DETAIL
Twofold Bay (NI2001/003)	NSW	Registered	ILUA covers 38 km^2 south of Eden partially overlapping Twofold Bay on the southern NSW coast
Gunaikurnai Settlement ILUA (VI2010/003)	VIC	Registered	ILUA covers 13,401 km^2 of the eastern Victorian coastline in the Gippsland region from Corner Islet to Orbost
Gunaikurnai and Icon Energy ILUA (VI2013/008)	VIC	Registered	ILUA covers 855 km^2 of the eastern Victoria coastline in the Gippsland region from Langsborough to Ninety Mile Beach

There are no registered ILUAs in Tasmania

Source: NNTT 2026

4.9.4. Indigenous Protected Areas

Indigenous Protected Areas (IPAs) represent more than 50% of Australia's Natural Reserve System and are areas of land and sea that are managed for biodiversity and conservation. IPAs deliver environmental, cultural, social and economic benefits through agreed management plans. In 2022, the Australian Government committed to extending the Sea Country IPAs program and announced 10 successful Sea Country IPA consultation projects which will support Indigenous led management of Sea Country (DCCEEW, 2022b). Two IPA consultation projects which overlap or adjacent to the EMBA and are described below.

4.9.4.1. Nanjit to Mallacoot Sea Country IPA Consultation Project

In 2022 the Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC) signed an agreement with the Commonwealth Government to begin the process of establishing a Sea Country IPA from Nanjit, east of Wilsons Promontory, to Mallacoota, on the Vic/NSW border (GLAWAC 2023). This voluntary agreement would see that the management of the sea, or land and sea, occurs in partnership with First Nations people and others in order to protect cultural and environmental values.

The Nanjit to Mallacoot Sea Country IPA consultation project (Figure 4-84), managed by the Gunaikurnai Land and Waters Aboriginal Corporation is located within the Gippsland region of Victoria. Conservation values within the area comprises of coastal parks and includes the Ramsar listed Gippsland Lakes and Raymond Island which are culturally significant sites (Section 4.7.4). This proposed IPA includes areas and resources of cultural significance which continue to be maintained by First Nations people of the area (DCCEEW, 2022b).



Figure 4-84: Sea Country Indigenous Protected Areas Program – Consultation Projects (DCCEEW, 2022b)

4.9.4.1. Tayaritja Sea Country IPA Consultation Project

The Tayaritja Milaythina Muka Indigenous Protected Area Sea Country consultation project (Figure 4-84), managed by the Tasmanian Aboriginal Centre, is located in the north-east Tasmanian waters and will link 5 existing island IPAs and other islands. RAMSAR wetlands and ecologically significant coastal habitats are located within the project. The IPA staff will rehabilitate, restore, monitor and evaluate significant marine ecosystems to help protect threatened marine animals, seabirds and over 120 plant species (DCCEEW, 2022b). This IPA overlaps the Flinders Marine Park and extends from east Tasmania over the submerged land bridge and surrounds the Bass Strait Islands (DNP, 2025).

4.9.5. First Nations Groups Identified within the EMBA

Due to the limited availability of public sources identifying values and sensitivities of First Nations groups and individuals within the EMBA, the summaries described in Section 4.9.6 draw on broader representations sourced from the Aboriginal Corporations, Aboriginal Land Councils, and Aboriginal Land Centres.

4.9.5.1. Victoria

First Nations Registered Aboriginal Parties in Victoria that overlap the EMBA include the Boonwurrung people represented by the Bunurong Land Council Aboriginal Corporation and the Gunaikurnai people, represented by the Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC) as shown in Figure *4-85*. The Gunaikurnai people are the Traditional Custodians of the Sea Country that overlaps the Operational Area. No cultural values, sensitivities, or issued were raised during consultation with GLaWAC ([#402] APPENDIX D).

Emperor Energy consulted with the First Peoples State Relations (Victoria) during consultation. There was no feedback received, or values and sensitivities raised by the department [VIC-FPSR-02] (APPENDIX D).

4.9.5.2. New South Wales

First Nations groups within the NSW Aboriginal Land Council (NSWALC) comprised of the South Coast and Sydney/Newcastle peoples as shown in Figure *4-86*. The South Coast peoples and the Syndey/Newcastle peoples are collective groups are comprised of Local Aboriginal Land Councils (LALC), each with its own board and CEO. Within the South Coast peoples, the EMBA overlaps the of Eden, Bega, Merrimans, Wagonga, Bodalla, Cobowra, Mogo, Batemans Bay, Ulladulla, Jerrinja, and Illawarra LALC. Within the Sydney/Newcastle group, the EMBA overlaps the La Perouse LALC.

4.9.5.3. Tasmania

There are currently no registered Native Title claims in Tasmania. However, the Tayaritja Milaythina Muka IPA project located in north-eastern Tasmanian waters (Section 4.9.4.1) is managed by the Tasmanian Aboriginal Centre who represents the political, community and cultural aspirations of the Tasmanian Palawa/Pakana people.

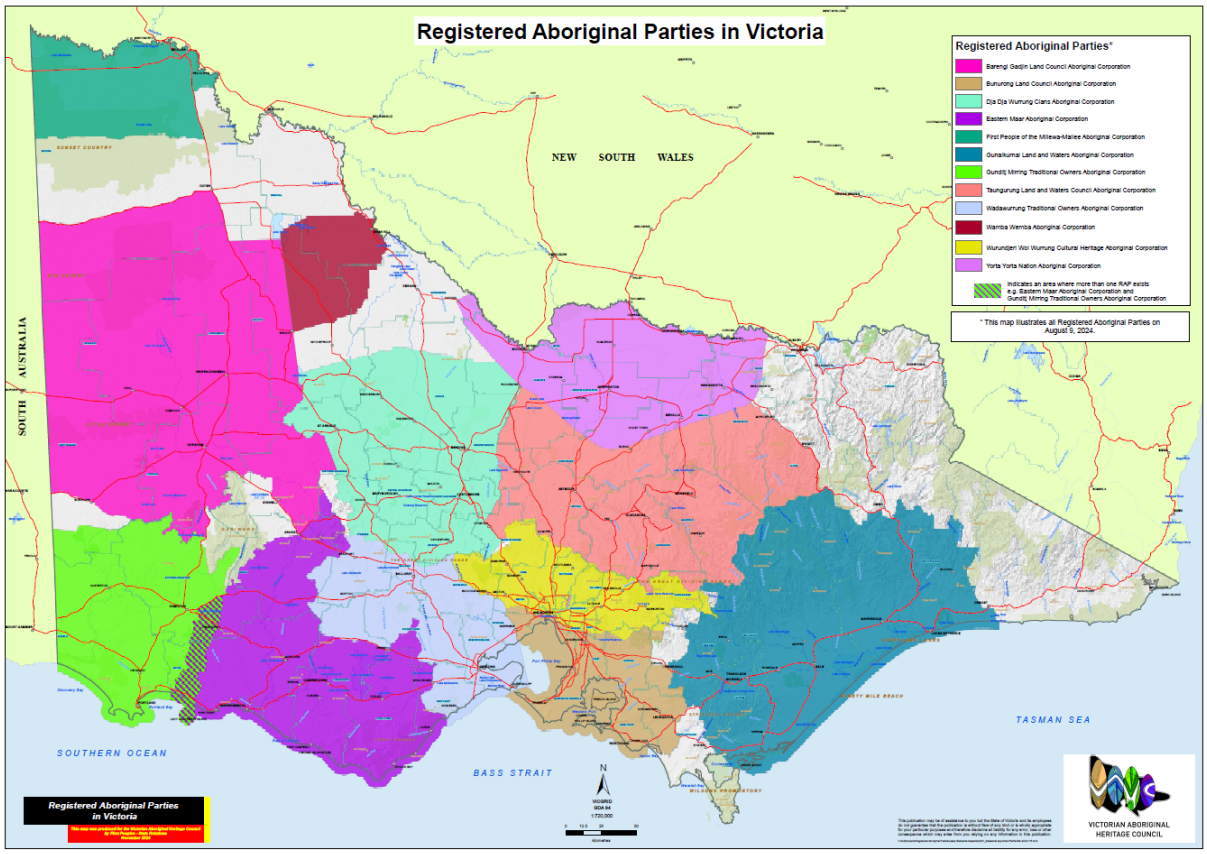


Figure 4-85: Map of Registered Aboriginal Parties in Victoria (VAHC, 2024)

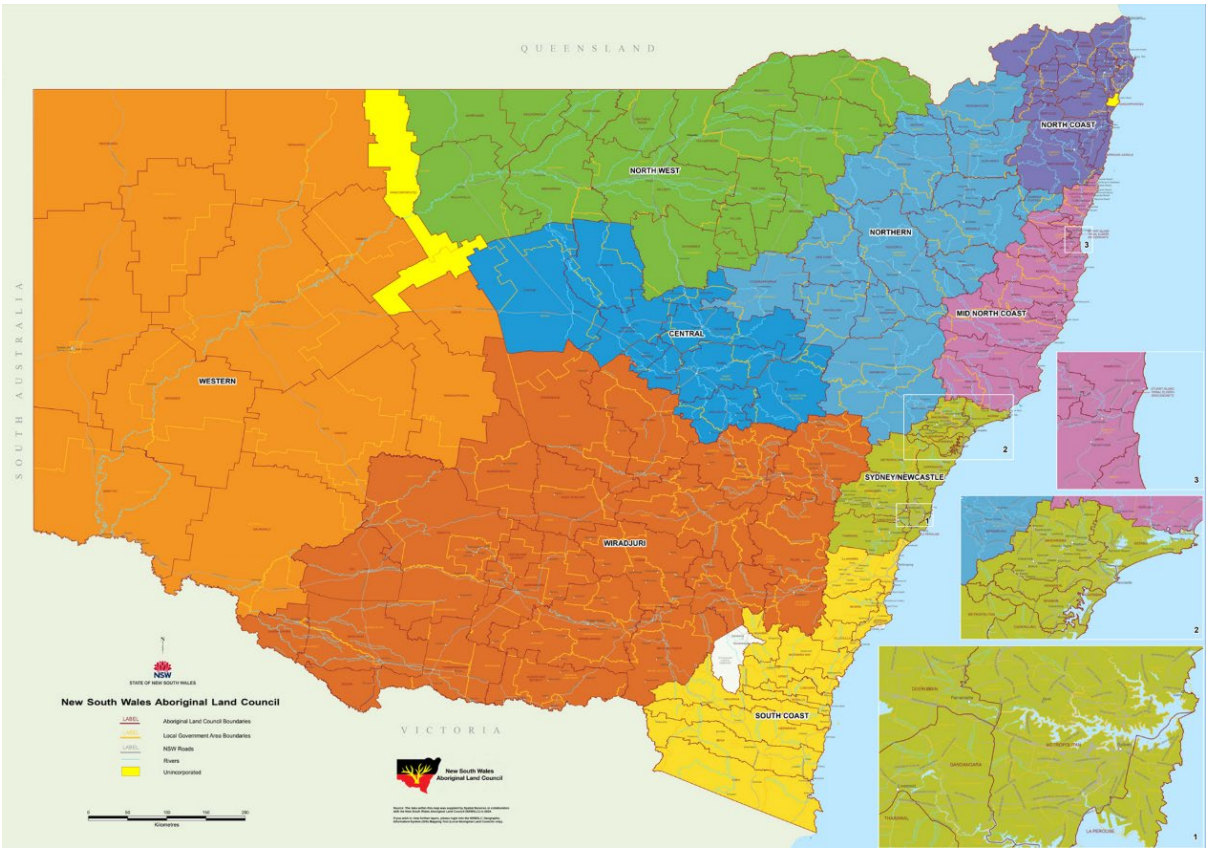


Figure 4-86: New South Wales Aboriginal Land Council Map (NSW ALC, 2026)

4.9.6. First Nations People's Values and Sensitivities

First Nations cultural values and sensitivities may include heritage sites and values that relate to First Nations people's traditional culture and customs. Cultural heritage refers to the knowledge, lore, practices, objects, places and people that are valued, culturally significant and connected to the identity of Country. Cultural heritage has been passed down from Ancestors to future generations and shapes identity and is fundamental to the wellbeing of First Nations people and connecting communities. Traditional Owners are custodians of culturally significant values that govern cultural practices, systems of belief, and maintain holistic relationships with Country (Victorian Aboriginal Heritage Council, 2021).

The South-east Saltwater Council provides the following articulation of values of the South-East Marine Region (DNP, 2025):

> *Traditional Owners cultural and other values specifically acknowledge the deep and unbroken connection between our people and Sea Country, as an intrinsic part of our identity – past, present and future. Our values include respect and responsibility for the health and wellbeing of Country and people. Country is viewed as interconnected and interdependent, with artificial or imposed colonial boundaries, and siloed approaches to management – being opposite and often detrimental to our values, cultural practices, beliefs and knowledge about sustainable uses.*
>
> *Our cultural values and knowledge systems – passed down through generations – include creation stories; discrete men's and women's cultural practices and obligations to care for Country; knowledge about how to care for Sea Country and conduct of cultural and other practices; knowledge about places and objects such as sites to be protected, species, biodiversity and ecosystem priorities, conservation and protection.*

Cultural values and sensitivities that were identified within the EMBA are summarised in Section 4.9.6.1 to Section 4.9.6.6, and organised by the First Nations groups (where identified). these broader discussions do not apply uniformly across all First Nations groups or individuals within the EMBA, as this assessment has been limited to publicly available literature, data, and values and sensitivities identified through consultation. Ongoing consultation with relevant First Nations groups as per regulation 22(15) of the OPGGS(E) Regulations will continue to ensure that any additional cultural values or sensitivities are identified and appropriately considered.

4.9.6.1. Submerged Cultural Landscapes within the EMBA

During recent ice age periods, with the last approximately 12,000 years ago, sea levels were significantly lower, and the coastline extended a significant distance seaward of its present location which enabled First Nations people to occupy and travel across the dry land bridge, known as the Bassian Land Bridge between Tasmania and the mainland, (National Museum Australia, 2022). Rising sea levels at the end of the last Ice Age, around 14,000 years ago, inundated most of the Bassian Land Bridge, leaving only the shallowest crossing accessible on foot through the Bass Strait near Wilsons Promontory in Victoria and north of Hogan Island, which is located 217 km and 177 km southwest of the Operational Area, respectively. Based on bathymetric and topographic data of the land and seafloor of Bass Strait, the Bassian Land Bridge was completely submerged by approximately 12,000 years ago (Adeleye et al., 2021; Hamacher et al., 2023).

The original surface of the land bridge is likely to have been eroded and removed, with any remaining tangible artefacts buried beneath deep marine sediments (Biosis, 2023). Rising sea levels following the last glacial maximum, combined with the known sea states of the Victorian coast including water depths and velocities, would make the preservation of any recently buried anthropogenic structures or sites, highly unlikely (Biosis, 2023).

The Bassian Land Bridge area is culturally significant to the Gunaikurnai peoples, particularly as a place of intergenerational knowledge sharing (Gunaikurnai Land and Waters Aboriginal Corporation, 2015). Dreaming stories reinforce memories and Songlines relating to the flooding and the enduring connection to Sea Country (Biosis, 2023; Nunn and Reid, 2016). These narratives also serve as evidence of the longevity and global significance of oral tradition (Nunn and Reid, 2016).

In the wider south-east marine region, submerged areas within the region were used by First Nations people during the last ice age (Pleistocence), prior to sea levels rising. This large area connected Tasmania to the mainland and was inhabited by First Nations people prior to being submerged. The flooding of this Sea Country has also been passed down in oral traditions, which details stories passed down over thousands of years. Several marine parks overlap the submerged paleo-landscape including Beagle, Flinders, and Apollo Marine Parks (DNP, 2025).

A study conducted by Extent Heritage (2024) investigated that the offshore submerged landscapes of Victoria that were deemed 'mappable' and it was shown that the locations which have a higher likelihood for containing Aboriginal archaeological heritage and/or culturally significant landforms include:

- Submerged landscapes lying 300 m either side of the centreline of a paleochannel, or 300 m from the edge of features that would have been present prior to inundation including permanent or semi-permanent water sources such as creeks, rivers, swamps, wetlands, or lakes present in the last 65,000 years.
- Flat or gentle inclinations on surfaces of former escarpments, cliffs, ridges, particularly on land surfaces that would have overlooked previous coastlines or bodies of water.
- Former sea cliff rock overhangs.
- Stony rises or eruptions points that formed higher viewing points on the landscape.
- Former barrier dunes that created ridgelines parallel to the coastline.
- Higher areas of landscape that may have formed sea stacks or islands during the lower sea level periods.
- Coastlines, beaches, and dune areas are likely to be areas of high archaeological sensitivity and may have had the potential for economic, social and spiritual significance to First Nations.

Geological evidence in Holdgate et al. (2003) indicates that extensive terrestrial landscapes with interconnected river systems and lakes were present across Gippsland well before Holocene sea-level rise. Beneath the modern Gippsland Lakes, a Pliocene coastal barrier sequence is overlain by fluvial sand-gravel and lacustrine mud, which indicates that prolonged freshwater environments were present during the Pleistocene (approximately 2.58 million to 11,700 years ago). Magnetic imaging reveals palaeoriver channels trending south-southeast across what is now the continental shelf, confirming that large river systems extended far beyond the current coastline. Offshore sediments also display signs of meteoric water exposure, suggesting that areas now submerged were once dry land. These findings demonstrate that Gippsland was not continuously marine but alternated between coastal and terrestrial conditions, creating habitable landscapes long before the Holocene transgression (Holdgate et al., 2003). This evidence suggests that these environments would have provided abundant resources and supported human occupation prior to the inundation of the shelf. Which supports the evidence from oral stories passed down through Australian Aboriginals which tell of a time that the former coastline of Mainland Australia was inundated by rising sea levels (Dunn and Reid, 2015; Hamacher et al., 2023), supporting the cultural knowledge of First Nations occupation of submerged Sea Country throughout Gippsland. Although, these lands are now

submerged, this area is culturally significant to First Nations peoples, whose relationship and responsibility to the Sea Country continues.

Figure 4-87 illustrates the Judith-2 exploration well location within the Operational Area in ~76 metres of water, with the broader Operational Area depths ranging between 60 to 76 metres. The Operational Area overlays palaeogeographic reconstructions showing the extent of exposed continental land during the Last Glacial Maximum (22–17 ka, when sea level was about 125 m lower) and at around 14 ka (about 60 m lower). These reconstructions indicate that the Operational Area is located within a now submerged Sea Country which, as evidenced above, supported First Nations occupation.

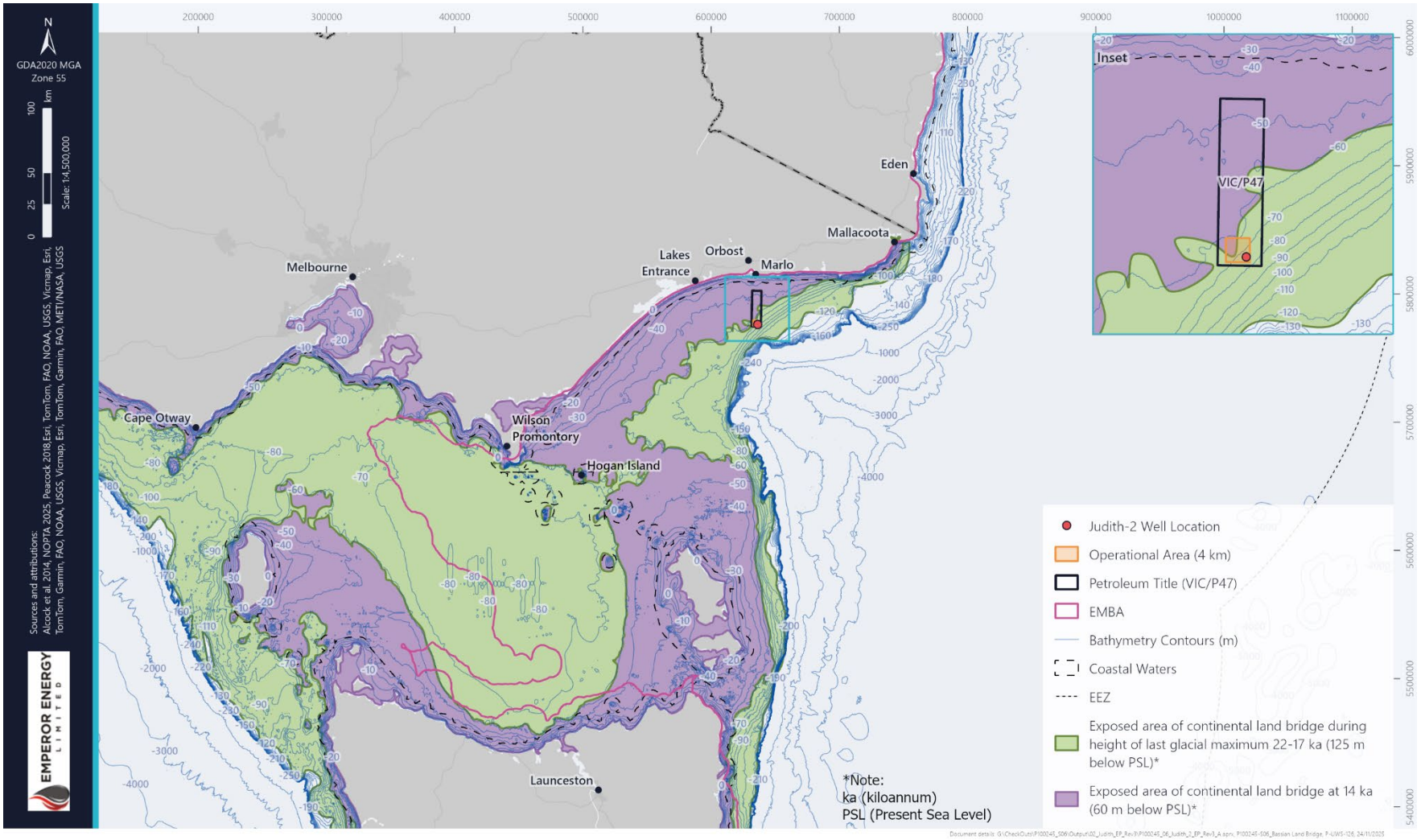


Figure 4-87: Extent of Exposed Continental Land Bridge During Past Sea-Level Lows in Relation to Judith-2 Well Location and Operational Area

4.9.6.2. Connection to Sea Country

First Nations people are the oldest surviving culture in the world and have been sustainably using and managing Sea Country in Australia for over 60,000 years (AIATSIS, 2025), and in some cases before rising sea levels created marine environments (Smyth, 2007). Australia comprises of many different and distinct Aboriginal and Torres Strait Islander groups, each with distinct Lores, customs, languages, beliefs and practices (AIATSIS, 2025). Despite this diversity, First Nations people all share a deep connection to Country. Country refers to more than just a place, it is intrinsically linked to the values, places, resources, stories, and cultural obligations associated of First Nations within a geographical area. For coastal First Nations people, Country includes both land and sea areas, which are inseparable from one another (Smyth, 2007).

For many First Nations communities, Sea Country also includes submerged cultural landscapes (described in Section 4.9.6.1) that were once dry land, reflecting ancestral occupation and cultural practices that pre-date sea level rise and providing an important connection Sea Country.

First Nations people have long held strong connections to the south-east marine region and have occupied coastal land and waters for over 40,000 years (CoA, 2015). The coastal areas were amongst the most densely populated regions of pre-colonial Australia due to the richness and convenience of both terrestrial and marine resources (GLaWAC, 2023; DNP, 2025). First Nations people continue to use and manage coastal and marine environments in the south-east marine region as a resource, which is used to maintain connection to cultural identity, health and well-being (DNP, 2025). First Nations communities believe there is no distinction between the land and sea and consider it all to be a part of Country. Coastal waters were essential gathering places for people to live as well as launching places for expeditions to sea to gather resources (GLaWAC, 2023). Through cultural traditions, First Nations people maintain cultural connection to ancestral lands and waters, termed Country and Sea Country and use coastal areas and waters for food resources and cultural practices and traditions and maintain cultural obligations to care for Country (GLaWAC, 2015).

First Nations Registered Aboriginal Party (RAPs) have defined boundaries which extend to coastal waters. However, Sea Country may include areas that extend beyond formally defined RAPs to include the sea and submerged lands extending to the continental shelf.

The values and sensitivities for Sea Country that were identified within the EMBA are summarised in Table 4-27.

Table 4-27: First Nations people values and sensitivities identified for Sea Country within the EMBA

FIRST NATIONS GROUPS	VALUES AND SENSITIVITIES	POTENTIAL FOR OVERLAP	
		OPERATIONAL AREA	EMBA
Gunaikurnai Land and Waters Aboriginal Corporation (2015)	Gunaikurnai people have occupied and managed coastal areas for thousands of years, including lands that area now submerged (described in Section 4.9.6.1), and are the Traditional Custodians of the Sea Country within the Operational Area. Sea Country encompasses marine food resources, places to live and hunt, and practice cultural traditions. The Gunaikurnai people have an approved non-exclusive Native Title extending from West	✓	✓

FIRST NATIONS GROUPS	VALUES AND SENSITIVITIES	POTENTIAL FOR OVERLAP	
		OPERATIONAL AREA	EMBA
	Gippsland in Warragul, east to the Snowy River and north to the Great Dividing Range; and 200 m offshore. No additional values or sensitivities were identified during consultation (APPENDIX D).		
Boonwurrong/ Bunurong people	The Bunurong people maintain connection to Country within the EMBA to preserve and protect the sacred lands and waterways of Bunurong Ancestors, places, traditional cultural, practices and stories (Bunurong Land Council Aboriginal Corporation, 2024). No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓
New South Wales Aboriginal Land Council (2025)	The First Nations people within the NSW ALC have an ongoing deep connection to Country within the EMBA and maintain a unique knowledge of lands and sea. NSWALC maintains ranger programs and other initiatives to help prevent environmental degradation and restore biodiversity. No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓
Palawa/Pakana people	The Palawa people have an unbroken deep ongoing connection to Country within the EMBA, which includes the lands, waterways, seas and skies. Pala people are not separate to Country, it is a part of the people and intrinsic to culture and tunapri/knowledge. Palawa people have an unbroken obligation to care for and look after Country, which holds lore, custom and language. It is the centre of the Palawa spiritual and cultural practice and has sustained Pala people for millennia. "Healthy Country is healthy people" (TAC, 2026). No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓

4.9.6.3. Culturally Significant Sites and Sacred Areas

First Nations people are culturally obligated to care for and protect Country for present and future generations. Roles of caring for Country varies depending on First Nations groups and regions (Gunaikurnai Land and Waters Aboriginal Corporation, 2015). Culturally significant sites and sacred areas may be present across Sea Country and the surrounding landscape, reflecting deep ongoing connections to place.

First Nations people used the now-submerged south-east marine region during the Pleistocene, including the former land connection between Tasmania and the mainland, prior to sea-levels rising. The inundation

of this Sea Country is reflected in oral traditions and overlaps Beagle, Flinders and Apollo Marine Parks (DNP, 2025).

A cultural Heritage Report commissioned by ConocoPhillips (Biosis, 2023), showed that along the Victorian coast, there were 5,636 registered Aboriginal places, with the most common site types being shell middens (46.82%), artefact scatters (39.21%) and low-density artefact distribution (5.70%). Shell middens were typically found along the coastline, whereas artefact scatters were found along the coast and inland along freshwater sources, likely part of inland-coastal travel routes.

Values and sensitivities for culturally significant sites and sacred areas that were identified within the EMBA are summarised in Table 4-28.

Table 4-28: First Nations people's values and sensitivities identified for Culturally Significant Sites and Sacred Areas within the EMBA

FIRST NATIONS GROUPS	VALUES AND SENSITIVITIES	POTENTIAL FOR OVERLAP	
		OPERATIONAL AREA	EMBA
Gunaikurnai Land and Waters Aboriginal Corporation (2015)	The Gunaikurnai maintain customary rights and responsibility to care for sacred places and Country which provides in turn cares for Gunaikurnai people. Over 10,000 years ago the land between Tasmania and Victoria was connected by a land bridge. Marine Parks and reserves around Wilsons Promontory were terrestrial habitats and inhabited by First Nations ancestors. Wilsons Promontory has habitat that supports a diversity of marine flora and fauna, including culturally significant migratory shorebirds and fur seals. No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓
Boonwurrong/ Bunurong people	The Bunurong RAP group includes Mornington Peninsula, Western Port and the eastern most part of South Gippsland. There is a total of 677 registered shell midden sites found within 200 m of the shorelines which shows the long-lived relationship Bunurong people have had with the Bunurong coastlines (Biosis 2023). No additional values or sensitivities were identified during consultation (APPENDIX D).	-	✓
New South Wales Aboriginal Land Council (2025)	The First Nations people of NSW maintain on going connection to cultural heritage and sacred sites and continue to advocate for increased protection of Aboriginal Culture and Heritage protections and self-determination. No additional values or sensitivities were identified during consultation (APPENDIX D).	-	✓

FIRST NATIONS GROUPS	VALUES AND SENSITIVITIES	POTENTIAL FOR OVERLAP	
		OPERATIONAL AREA	EMBA
Palawa/Pakana people	The Aboriginal Heritage Register is a database of Aboriginal Heritage places and objects which are of significance to the First Nations people of Tasmania. There are currently over 13,000 known places of significant places and objects listed on the register. However, the information is not publicly accessible as it contains culturally sensitive information (AHT, 2024). On the Tasmanian coast, Aboriginal Heritage can be expected to occur in any of the low-lying coastal areas, shelter sites, and sources of food, water and raw materials. The west coast of Tasmania is also known to contain a number or rock art sites along the coast and tidal margins. Large midden sites and stone quarries are also found located close to the waters edge and tidal margins (Biosis, 2023). The Palawa community is committed to caring for culturally significant milaythina muka/Sea Country. The Tayaritja Sea Country IPA project commenced in 2022 and surrounds the Tayaritja/Bass Strait islands and the northeast waters of Lutruwita/Tasmania (Section 4.9.4.1). In the past, the Tayaritja Islands (Bass strait Islands) were connected to Lutruwita/Tasmania, which gives Tayaritja special significance for Palawa people as it is the ancient homeland of Palawa people (The Land Bridge, 2024). No additional values or sensitivities were identified during consultation (APPENDIX D).	-	✓

4.9.6.4. Knowledge Systems

First Nations knowledge is passed down from Ancestors to future generations. Knowledge systems are an intrinsic value of First Nations people and an important aspect of maintaining living culture. (Gunaikurnai Land and Waters Aboriginal Corporation, 2015).

First Nations people in the South-east Network continue to maintain and honour the knowledge on saltwater Songlines, migrations, stories and ancestral connections with knowledge that has been passed down through generations (DNP, 2025).

Values and sensitivities of knowledge systems that were identified within the EMBA are summarised in Table 4-29.

Table 4-29: First Nations people's values and sensitivities identified for Knowledge Systems within the EMBA

FIRST NATIONS GROUPS	VALUES AND SENSITIVITIES	POTENTIAL FOR OVERLAP	
		OPERATIONAL AREA	EMBA
Gunaikurnai Land and Waters Aboriginal Corporation (2015)	Gunaikurnai people maintain customs and traditions which are passed through generations through song, dance, story, Dreaming, and being on Country. Wilsons Promontory is a culturally significant site and valued for sharing intergenerational knowledge between Gunaikurnai people. No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓
Boonwurrong/ Bunurong people	There are a large amount of registered shell midden sites within Bunurong Country which suggests knowledge systems of marine resources and an understanding of marine resources was used as practiced techniques by the Bunurong people to accumulate the amount of listed shell midden sites on Bunurong Country (Biosis, 2023). No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓
New South Wales Aboriginal Land Council (2025)	Aboriginal culture and heritage are vital for the First Nations people of NSW to thrive as distinct and self-determining people. The cultural heritage and traditional knowledge practices must be respected, protected, and revitalised for future generations. The NSWALC supports initiatives such as the Junior Ranger Program, and other initiatives that elevate Aboriginal led solutions to protecting culture, heritage and the environment and works to maintain and invest in knowledge systems across NSW. No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓
Palawa/Pakana people	The Tayaritja IPA project is helping to maintain knowledge by working with the Palawa women to maintain kanalaritja (shell necklace-making) knowledge to help care for shells and safeguard cultural practices (The Land Bridge, 2024). No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓

4.9.6.5. Culturally significant species – whales, dolphins, seals, seabirds and shorebirds

Many marine species such as whales (including humpback whales), dolphins, seals, and seabirds are culturally significant for First Nations people in the South-east Network. Mutton birds, seals and humpback whales are wide-ranging animals that forage and migrate through the area, with seasonal movements noted in Songlines and Dreaming for some First Nations groups. First Nations people have cultural obligations to manage and care for marine resources (DNP, 2025).

Values and sensitivities for culturally significant species, including whales, dolphins, seals, seabirds and shorebirds that were identified within the EMBA are summarised in Table 4-30.

Table 4-30: First Nations people's values and sensitivities identified for Culturally significant species – whales, dolphins, seals, seabirds and shorebirds within the EMBA

FIRST NATIONS GROUPS	VALUES AND SENSITIVITIES	POTENTIAL FOR OVERLAP	
		OPERATIONAL AREA	EMBA
Gunaikurnai Land and Waters Aboriginal Corporation (2015)	Wilsons Promontory Marine Park is recognised by the Gunaikurnai for the significant habitat it provides for a high diversity of marine plants, shorebirds, and fur seals. No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓
Boonwurrong/ Bunurong people	Bunurong people maintain a connection to Sea Country and continue to manage areas that provide habitat for culturally significant species including Australian fur seals at Phillip Island (Bunurong Land Aboriginal Corporation, 2024b). No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓
New South Wales Aboriginal Land Council (2025)*	No information was identified from publicly available information or through consultation (APPENDIX D). Due to this uncertainty, there is potential for overlap of First Nations people's values and sensitivities identified for Culturally significant species within the Operational Area and EMBA.	✓	✓
Palawa/Pakana people	Muttonbirding is a culturally significant practice for the Palawa people. Palawa people are committed to safeguarding yula/muttonbirds (short-tailed shearwaters) from the effects of warming seas and plastics that are being found in yula/muttonbirds during the annual harvest. The Palawa people continue to manage and conserve Sea Country by engaging in conservation projects, including collaborating on projects to care for kelp forests and seagrass beds which area a	✓	✓

FIRST NATIONS GROUPS	VALUES AND SENSITIVITIES	POTENTIAL FOR OVERLAP	
		OPERATIONAL AREA	EMBA
	culturally significant habitat for many culturally significant species (The Land Bridge, 2024). No additional values or sensitivities were identified during consultation (APPENDIX D).		

4.9.6.6. Culturally significant species – food resources

Fish and seafood are valued sources of food and hold significance for First Nations People. These species support cultural practices linked to sustainable harvesting of seasonal resources and coastal use. Maintaining marine resources is integral for sustaining cultural identity and ongoing connections to Sea Country (Gunaikurnai Land and Waters Aboriginal Corporation, 2015; NOO, 2002b).

Values and sensitivities for culturally significant food sources that were identified within the EMBA are summarised in Table 4-31.

Table 4-31: First Nations people's values and sensitivities identified for Culturally significant species – food resources within the EMBA

FIRST NATIONS GROUPS	VALUES AND SENSITIVITIES	POTENTIAL FOR OVERLAP	
		OPERATIONAL AREA	EMBA
Gunaikurnai Land and Waters Aboriginal Corporation (2015)	Eels, bream, flathead, and pawns were and remain important food supplies for Gunaikurnai people. These resources are sources from freshwater and marine resources in Sea Country. Fishing and collecting of natural resources are valued by the Gunaikurnai and is a popular activity in the Gippsland Lake Coastal Park, among other locations in the region. No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓
Boonwurrong/ Bunurong people	Bunurong country contains many shell midden sites along the coastline which indicates that high use of water based food resources in the area (Biosis, 2023). No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓
New South Wales Aboriginal Land Council (2025)	NSWALC works to increase the management of lands, waters, cultural fishing and other natural resources which have been used and maintained by First Nations peoples for generations. No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓

FIRST NATIONS GROUPS	VALUES AND SENSITIVITIES	POTENTIAL FOR OVERLAP	
		OPERATIONAL AREA	EMBA
Palawa/Pakana people	Yula/muttonbirds (short-tailed shearwaters) are a culturally significant species which have been harvested for generations by the Palawa people (The Land Bridge, 2024). The Tsmanian coastline contains large shell midden sites along the coastline which indicates that high use of water based food resources in the area (Biosis, 2023). No additional values or sensitivities were identified during consultation (APPENDIX D).	✓	✓

5. ENVIRONMENTAL IMPACT AND RISK ASSESSMENT

To meet the requirements of the OPGGS(E) Regulations 21(5) and 21(6)– Evaluation of environmental impacts and risks, and 21(7) – Environmental performance outcomes and standards, this section evaluates the impacts and risks associated with the activity in accordance with the impact and risk assessment method (Section 2). The impact and risk assessment is appropriate to the nature and scale of each impact and risk and details the control measures that are used to reduce the risks to ALARP and an acceptable level.

Control Measures (CM), Environmental Performance Outcomes (EPO), Environmental Performance Standards (EPS), and Measurement Criteria (MC) have been developed, described, and summarised in Section 5.10.

Section 5 identifies the environmental impacts and risks of planned activities and unplanned events, assesses the impacts and risks to receptors, identifies control measures to reduce the impact or risk as far as practicable, determines ALARP and Acceptability.

The oil spill response strategies outlined in Section 6 were risk assessed separately along with ALARP and Acceptability justifications. The aim of the assessment was to identify if each spill response strategy is viable with respect to several environmental and operational considerations. Subsequently, ALARP and Acceptability justifications for each of the response strategies were made to enable a decision on their adoption.

5.1.Impact and Risk Scoping

As per the environmental impact and risk assessment methodology (Section 2), Emperor Energy has identified all impacts and risks to receptors which could potentially occur from the activity by considering the interactions between environmental aspects and the activity (Table 5-1).

Impacts and risks resulting from each of these interactions were identified at the project ENVID workshop and analysed further outside of the workshop where necessary to reduce uncertainty. The outcomes of this process, including consequence and likelihood analysis and evaluation, control measures identified, risk ranking and ALARP and acceptability determination, are provided in the following sections. EPOs, EPSs and measurement criteria are summarised in Section 5.10.

The differentiation between higher and lower order impacts and risks is colour coded for each aspect-activity interaction in Table 5-1. The assessments of impacts and risks are provided in the following sections:

- Section 5.2 - Lower Order Impacts and Risks.
- Sections 5.3 – 5.9- Higher order Impacts and Risks.

EPOs and EPSs relevant to impacts and risks for oil spill response strategies are detailed in Section 6.

Table 5-1: Activity-Aspect Interactions

ACTIVITY		ASPECT															
		PHYSICAL PRESENCE		PLANNED EMISSIONS			PLANNED DISCHARGES				UNPLANNED INTERACTIONS			ACCIDENTAL RELEASE			
		seabed disturbance	interaction with other users	light Emissions	atmospheric emissions	Underwater Sound emissions	drill cuttings and fluids	hydraulic fluids and chemicals	cement	Operational Discharges	interaction with marine fauna	introduction of IMS	hazardous and non-hazardous materials	vessel collision	Loss of well control
Site Surveys	Geophysical survey		✓			✓									
	Geotechnical survey	✓	✓			✓									
Drilling Activities	Well construction	✓				✓	✓								✓
	Cementing operations								✓						
	Formation evaluation														
	Contingency drilling activities														✓
	Well test			✓	✓										
	Well P&A	✓						✓	✓						✓
Support Activities	MODU positioning	✓	✓												
	MODU operations		✓	✓	✓	✓				✓		✓	✓	✓	
	Vessel operations		✓	✓	✓	✓				✓	✓	✓	✓	✓	
	ROV operations	✓						✓							
	Helicopter operations					✓									

	Lower order impact and risk
	Higher order impact and risk

5.2.Lower Order Impacts and Risks

The ENVID identified lower-order impacts and risks that did not trigger any factors requiring evaluation at a higher level. As outlined in Section 2.5, these factors relate to the need for modelling or an in-depth literature review to address uncertainty in the impact and risk evaluation. However, the following impacts and risks were assessed as not requiring modelling or detailed literature review due to the high level of certainty regarding their defined impact and risk levels. The assessment of these lower-order impacts and risks is provided below:

- Table 5-2 Planned Aspects, including:
  - Physical presence – interaction with other users
  - Emissions – atmospheric
  - Planned discharge – hydraulic fluids and chemicals
  - Planned discharge – cement
  - Planned discharge – operational discharges
- Table 5-3 Unplanned Aspects, including:
  - Physical presence – interaction with marine fauna
  - Physical presence – introduction of IMS
  - Accidental release – hazardous and non-hazardous materials
  - Accidental release – vessel collision

5.2.1. Impact and risk assessment – planned aspects

Table 5-2: Impact and risk assessment – planned aspects

ASPECT	ACTIVITY	IMPACT	IMPACT / CONSEQUENCE EVALUATION	SEVERITY LEVEL	DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
PHYSICAL PRESENCE									
Physical presence – interaction with other users	Support activities Site Surveys	Change to the functions, interests or activities of other users	Commercial fisheries Interaction with other users will be limited to within the Operational Area. As detailed in Section 4.8, the following fisheries may be active in the Operational Area. SESSF – Gillnet Hook and Trap Sector (Shark Gillnet sub-sector: low-medium) (Operational Area overlapping medium intensity by <0.02%) SESSF – Commonwealth Trawl Sector (Otter-board trawl: low-medium) (Operational Area overlapping medium and low intensity by <0.01%) SESSF – Commonwealth Trawl Sector (Danish seine) (Operational Area overlapping high intensity by ~0.33%) SESSF – Commonwealth Trawl Sector (squid catch) (Operational Area overlapping medium intensity by <0.01% and low intensity by <0.02%) Ocean Scallop Fishery (Victorian) (Operational Area overlapping report grid showing <5 days fished between 2013 to 2024) Inshore Trawl Fishery (Victorian) (Operational Area overlapping report grid showing <5 days fished between 2013 to 2024) MODU positioning and operations - While in position a 500 m PSZ will be maintained around the MODU, as required under the OPGGS Act. Fishing activities will be restricted within the 500 m PSZ surrounding the MODU, for the duration of the drilling activities. Site surveys - While undertaking the geophysical surveys the survey vessel will be able to manoeuvre to avoid any commercial fishing vessels. For the geotechnical survey, while sampling is occurring a commercial fishing vessel would need to manoeuvre around the vessel as per any other stationary or slow-moving vessel. It is expected site surveys will take approximately 9 days to complete, presenting a potential short-term impact to fisheries. The outcome of the impact assessment process identified the functions, interests and activities of commercial fisheries may be affected by the temporary presence of the MODU PSZ, however no stakeholder claims have been raised through the consultation process Therefore, the predicted severity level to commercial fisheries from a change to the functions, interests or activities resulting from the physical presence has been evaluated as **Minor (2)**.	2	A	**CM01:** Ongoing consultation **CM02:** MODU PSZ **CM03:** Marine Assurance Process **CM04:** Dropped objects recovery procedure (from seabed)	None identified	ALARP	Potential impacts from physical presence – interaction with other users are considered **Acceptable** having met all the acceptability criteria as follows: • Residual severity of slight (1) therefore will not contravene with the principles of ESD. • Control measures are consistent with good industry practice and demonstrated to reduce impacts to ALARP. • Relevant AGR standards and procedures used as controls. • No stakeholder objections or claims raised. • Other requirements including relevant legislation have been identified and applied as controls with respective EPSs. Implementing these control measures, as detailed in Section 5.10, will ensure the EPO1 is met. **EPO1:** Marine users are not excluded from areas other than those defined for safe operations of which agreed notifications will be issued. By meeting EPO1, it will ensure potential impacts will be at or below the defined Acceptable levels.
			Marine and coastal industry The physical presence of offshore infrastructure and vessels can result in displacement of other marine users: • During MODU positioning and MODU operations activities, a 500m PSZ will be in force around the MODU, preventing unauthorised access to other	1					

ASPECT	ACTIVITY	IMPACT	IMPACT / CONSEQUENCE EVALUATION	SEVERITY LEVEL	DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
			marine users. Marine and coastal industries will be required to avoid the temporary 500 m PSZ when the MODU is on location. The PSZ will remain in place for the life of the well, or until revoked. • From the presence of vessels, including as part of survey and support activities, which may disrupt other marine users, for example if the survey or support vessel has limited manoeuvrability. As described in Section 3.3.2, survey activities are expected to take up to 9 days and drilling activities are expected to take up to 60 days. Marine and coastal industries within the Operational Area is limited to shipping activity and there are no overlapping major shipping routes or other existing infrastructure. Overall, it is considered that there is available sea-room for vessels to route around the 500 m PSZ whilst it is in place, without any significant increases in fuel costs or transit durations, especially given the low levels of existing vessel traffic and existing infrastructure. Therefore, it is considered that other marine users will be able to tolerate minor temporary disruption. While undertaking the geophysical surveys the survey vessel will be able to manoeuvre to avoid any third-party vessels. For the geotechnical survey, when sampling is occurring a third-party vessel would need to manoeuvre around the vessel as per any other stationary or slow-moving vessel. Any disruption due to vessel presence will be temporary and highly localised, and therefore, it is expected that other marine users will be able to tolerate any minor temporary disruption caused. Good practice will be implemented to inform other marine users of the activity and the PSZ and measures will be implemented to address navigational safety risks in line with good practice and relevant legislative requirements (e.g. adherence to MO 30: Prevention of Collisions). Overall, the predicted severity level (consequence) to the marine and coastal industry from a change to the functions, interests or activities resulting from the physical presence has been evaluated as **Slight (1)**.						
			Recreation and tourism As described above, the presence of offshore infrastructure and vessels may displace other marine users, including tourist and recreational activities. Given the offshore location of the Operational Area and the lack of seabed features, marine tourism and recreation is unlikely to occur (Section 4.8.4). Therefore, no disruption to recreation and tourism activities is anticipated and the severity level (consequence) to recreation and tourism is evaluated as **Slight (1)**.	1					

ASPECT	ACTIVITY	IMPACT	IMPACT / CONSEQUENCE EVALUATION	SEVERITY LEVEL	DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
		Cumulative Impact	Cumulative Impact The Judith-2 operational area is on the western edge of the Gippsland Basin Area To Be Avoided surrounding the Esso Australia operated Gippsland Basin Joint Venture producing & non-producing assets. The planned short duration geophysical and geotechnical surveys, as detailed in this EP, are not considered to add to cumulative impacts to the greater Gippsland Basin, nor are any concurrent survey operations known presently. Specific to the drilling activity, the planned jack-up MODU to be used, would move to Emperor Energy following the completion of the ongoing campaign being conducted by Esso Australia on their Gippsland Basin assets. The closest offshore wind farm feasibility license (Navigator North) is approximately 35 km away from the Operational Area. This development was placed on hold by the operator in September 2025 with no survey or construction activities expected in the foreseeable future. No barriers to migration or movement of species were identified from activities conducted under this EP. Therefore, no cumulative impacts were identified.	N/A					
DISCHARGES									
Planned discharge – cement	Drilling activities	Change in water quality	Water quality Cementing fluids, including cementing mix water, may require discharge to the marine environment under various scenarios. During testing of the cementing unit and completions activities, a maximum of 48 m^3 may be released. In the event of a cement spoil or issue with cementing operations an additional 24 m^3 may be released. Unused bulk cement will remain on the MODU, be transferred to shore or discharged downhole, however in the unlikely event that these are not possible than approx. 100 m^3 of dry bulk will be discharged from the surface in a one of discharge of cement slurry at the end of the activity. Toxicity impacts are not predicted as cement is considered to PLONOR (Cefas, 2022). Discharge of cement particles at the surface will disperse under the action of waves and currents and eventually settle out of the water column; the initial discharge will generate a downwards plume, increasing the initial mixing of receiving waters. Modelling of large cement discharges (approximately 78 m^3 over a one-hour period) was completed for another offshore drilling project (BP, 2013). Results of this modelling showed that within two hours TSS concentrations ranged between 5-50 mg/L within the extent of the plume (approximately 150 m horizontal and 10 m vertical); and by four hours post-discharge, that concentrations were <5 mg/L within the plume range. Given that typical individual cementing discharges are anticipated to be, less than the volume modelled, it is expected that the concentration of total suspended solids would be lower. In context, during cyclones and storms TSS concentrations of tens or hundreds of mg/L over a few hours are common in tropical shallow water reef environments (Abdul Wahab et al. 2017; Fisher et al. 2015 cited in Jones et al., 2021).	1	A	CM05: AGR Chemical assessment procedure CM06: Residual materials manage-ment CM07: Cementing procedures	Not accepted: No overboard residual cement discharge. *Benefit unequal to risk*	ALARP	Potential impacts from planned discharge – cement are considered Acceptable having met all the acceptability criteria as follows: • Residual severity of slight (1) therefore will not contravene with the principles of ESD. • Control measures are consistent with good industry practice and demonstrated to reduce impacts to ALARP. • Relevant AGR standards and procedures used as controls. • No stakeholder objections or claims raised. • Other requirements including relevant legislation have been identified and applied as controls with respective EPSs, including the requirements of the Minamata Convention on Mercury Implementing these control measures, as detailed in Section 5.10, will ensure the EPO2 is met. EPO2: Impacts from planned discharges are limited to: • Localised* and temporary changes in water and sediment quality, • Localised* and temporary behavioural changes to marine fauna and • Localised* change in benthic habitats and communities.

ASPECT	ACTIVITY	IMPACT	IMPACT / CONSEQUENCE EVALUATION	SEVERITY LEVEL	DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
			Water quality within the Operational Area is representative of the quality in the wider Twofold Shelf region. No long-term or continuous discharge of cement is planned and with consideration of the high energy marine environment at the Operational Area, a change in water quality from cement discharges will only result in a localised and short-term impact around the well location with no long-term consequences. The severity level (consequence) is assessed as **Slight (1)**.						*Localised is defined as within 500 m of the discharge location. By meeting EPO2, it will ensure potential impacts will be at or below the defined Acceptable levels.
	Change in sediment quality		<u>Sediment quality</u> Cement volumes are such that for the 30" x 20" casing and the 13 3/8" casing approximately 76 m^3 of cement will be discharged to seabed. Sediment quality within the Operational Area is expected to be of high quality with background concentrations of trace metals and organic chemicals. Toxicity impacts are not predicted as cement is considered to PLONOR (Cefas, 2022). Change in sediment quality from cement discharges at the seabed will be limited to the area immediately around the well. The area impacted is anticipated to be within the high impact zone, a 75 m radius of the well (Jones et al., 2021). No long-term or continuous discharge of cement is planned and with consideration of the high energy marine environment at the Operational Area, a change in sediment quality from cement discharges will only result in a localised and short-term impact around the well location with no long-term consequences. The severity level (consequence) is assessed as **Slight (1)**.	1					
	Change in habitat		<u>Benthic habitats and communities</u> Cement volumes are such that for the 30" x 20" conductor and the 13-3/8" casing approximately 76 m^3 of cement will be discharged to seabed. The benthic habitat in the offshore Operational Area, is expected to comprise of sandy substrate devoid of large epifauna except for introduced screw shells and sponges (CEE Consultants, 2003). Benthic communities in the offshore Operational Area, is expected to be limited to sparse epifauna and infauna communities related to sandy substrates, highly represented within the Twofold Shelf bioregion (IMCRA, 1998). Subsea discharge of cement is expected to smother benthic epifauna and infauna communities leading to a temporary change in habitat around the well location. Cement discharged at the seabed is not expected to disperse as it is designed to set in a marine environment and will therefore set in-situ. BP (2013) modelled a 200 t (~83 m^3) cement discharge at the seabed and found changes to the benthic environment were limited to within 10 m of the well. The Operational Area does not overlap threatened benthic communities, protected areas or KEFs with benthic habitats and communities. A change in habitats from cement discharges will result in a localised impact around the well location with no long-term consequences to benthic fauna. Given the highly localised nature of the impact, the severity level (consequence) is assessed as **Slight (1)**.	1					

ASPECT	ACTIVITY	IMPACT	IMPACT / CONSEQUENCE EVALUATION	SEVERITY LEVEL	DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
		Injury / mortality to marine fauna	Marine fauna Cement volumes are such that for the 30" x 20" conductor and the 13-3/8" casing approximately 76 m^3 of cement will be discharged to seabed. Cement is listed as a substance that is considered to pose little or no risk to the environment and, together with water, forms the majority of cement slurry. Other products are used to adjust the properties of the cement slurry, to ensure the cement sets as intended, accounting for the temperatures, pressures and contents of the well. Surface cement slurry discharges are expected to result in a highly localised and temporary suspended solid plume, preventing long-term exposure to less mobile fauna, such as plankton, some fish species (e.g. syngnathids) and some sessile marine invertebrates. The high energy conditions in the operational area will result in a rapid dispersion of the drilling discharges plume, and any concentrations of suspended solid concentrations of cement would become further diluted over time. Impacts to mobile fauna such as pelagic fishes, sharks, rays, reptiles and marine mammals are not expected given their ability to avoid effected areas (IOGP, 2016). Impacts from cement discharges are expected to be limited to less mobile fauna, such as slow swimming syngnathid species, of which are not found in the Operational Area. Injury / mortality of any marine fauna, including syngnathids, will be limited to any individual in the immediate vicinity of the well, with no long-term consequences. The severity level (consequence) is assessed as **Slight (1)**.	1					
Drilling activities	Change in water quality Change in sediment quality Change in habitat Injury / mortality to marine fauna		Cultural heritage values and sensitivities Impacts to water and quality, changes in habitat and impacts to marine fauna from discharges has the potential to result in physical and tangible change to cultural heritage value of oceans waterways. As summarised above, change in sediment quality, change in water quality, change in habitats, and injury/mortality to marine fauna is expected to be localised to the Operational Area, with no long-term consequences. The severity level (consequence) is assessed as **Slight (1)**.	1					
		Cumulative impact	Cumulative Impact The Judith-2 operational area is on the western edge of the Gippsland Basin Area To Be Avoided surrounding the Esso Australia operated Gippsland Basin Joint Venture producing & non-producing assets. The planned short duration geophysical and geotechnical surveys, as detailed in this EP, are not considered to add to cumulative impacts to the greater Gippsland Basin, nor are any concurrent survey operations known presently. Specific to the drilling activity, the planned jack-up MODU to be used, would move to Emperor Energy	N/A					

ASPECT	ACTIVITY	IMPACT	IMPACT / CONSEQUENCE EVALUATION	SEVERITY LEVEL	DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
			following the completion of the ongoing campaign being conducted by Esso Australia on their Gippsland Basin assets. The closest offshore wind farm feasibility license (Navigator North) is approximately 35 km away from the Operational Area. This development was placed on hold by the operator in September 2025 with no survey or construction activities expected in the foreseeable future. No barriers to migration or movement of species were identified from activities conducted under this EP. Therefore, no cumulative impacts were identified.						
Planned discharge – Operational Discharges	Support activities	Change in water quality	<u>Water quality</u> During drilling activities, the MODU may have up to 112 POB, resulting in operational discharges of sewage and greywater, at an expected of ~240 m^3 / day. A release rate of 150 m^3 / day of sewage, greywater, cooling water and brine in the offshore marine environment from a fixed facility is not expected to exceed a 500 m mixing zone boundary (NERA, 2017). Potential change in water quality from intermittent discharge of sewage, greywater, cooling water and brine will be limited to open-offshore waters of the Operational Area over 60 days. Water quality within the Operational Area is expected to represent the high-water quality found in offshore Victorian waters. Discharge of sewage, greywater, cooling water and brine is expected to rapidly disperse in the high-energy environment of the Operational Area. <u>Sewage:</u> Sewage discharge monitoring for another offshore project (Woodside Energy Ltd, 2014), determined that intermittent sewage discharges of 10 m^3 were rapidly diluted within 50 m of the discharge point. Change in water quality within the high-energy environment of the Operational Area will be localised. <u>Cooling water and brine:</u> Cooling water acts as a heat exchange medium to cool machinery engines on the MODU and support vessels. Seawater is drawn from the ocean and flows counter-current through closed-circuit heat exchangers, transferring heat from the engines and machinery to the seawater, which is then discharged back into the ocean. Cooling water temperatures vary with the vessel engine's workload and activity, generally around 32°C. Discharges of cooling water to the marine environment will result in a short-term and localised elevation in surface waters at the discharge point. Concentrated brine is a waste stream created through the vessel desalination equipment for potable water generation. Brine generated from the water supply systems on-board vessels will be discharged to the ocean at a salinity of approximately 20-50% higher than surrounding seawater. The rate of cooling water and RO brine discharged from the MODU and support vessels is expected to be ~4,968 m^3 / day. The intermittent discharges are expected to be limited to the open-offshore waters of the Operational Area over 60 days.	1	A	CM08: Planned Maintenance System CM05: AGR Chemical assessment procedure CM09: Marine assurance system - vessel contractor pre-qualification assessment	None identified	ALARP	Potential impacts from planned discharge – Operational Discharges are considered Acceptable having met all the acceptability criteria as follows: • Residual severity of slight (1) therefore will not contravene with the principles of ESD. • Control measures are consistent with good industry practice and demonstrated to reduce impacts to ALARP. • Relevant AGR standards and procedures used as controls. • No stakeholder objections or claims raised. • Other requirements including relevant legislation have been identified and applied as controls with respective EPSs Implementing these control measures, as detailed in Section 5.10, will ensure the EPO2 is met. EPO2: Impacts from planned discharges are limited to: • Localised* and temporary changes in water and sediment quality, • Localised* and temporary behavioural changes to marine fauna and • Localised* change in benthic habitats and communities. *Localised is defined as within 500 m of the discharge location. By meeting EPO2, it will ensure potential impacts will be at or below the defined Acceptable levels.

ASPECT	ACTIVITY	IMPACT	IMPACT / CONSEQUENCE EVALUATION	SEVERITY LEVEL	DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
			Discharged cooling water and RO brine is expected to rapidly disperse through the surface layer of water because of the high-energy environment within the Operational Area. Previous studies on wastewater discharges show no elevation in levels above background concentrations in proximity to the discharge point (Woodside 2008, 2014; Shell, 2009). Bilge water: Bilge water generated on the MODU and support vessels consists of deck drainage and water from machinery spaces directed to a bilge water tank. Contaminants can include chemical spills on deck. This bilge water is diverted to a holding tank for either onshore disposal at a licensed facility or discharge, ensuring an oil content of <15ppm in accordance with Marine Order 91. Deck drainage and bilge may contain trace amounts of chemicals and hydrocarbons. Intermittent discharges of deck drainage and bilge are expected to be limited to the open-offshore waters of the Operational Area over 60 days. Discharged deck drainage and bilge is expected to rapidly disperse through the surface layer of water because of the high-energy environment within the Operational Area. Previous studies on wastewater discharges show no elevation in levels above background concentrations in proximity to the discharge point (Woodside 2008; 2014; Shell 2009). Change in water quality within the high-energy environment of the Operational Area will be localised, with no long-term consequences. Impacts are assessed as **Slight (1)**.						
Support activities	Injury / mortality to marine fauna	Marine fauna The rate of sewage, greywater, cooling water, and brine discharged from the MODU and support vessels is expected to be ~72 m^3 / day based on ~0.04 m^3 and 0.45 m^3 of sewage/grey water generated per person, per day (EMSA, 2016). The intermittent discharges are expected to be limited to the open-offshore waters of the Operational Area over 60 days. Discharge of sewage, greywater, cooling water, and brine is expected to rapidly disperse because of the high-energy environment within the Operational Area. Eutrophication occurs when the addition of nutrients, such as nitrates and phosphates from sewage, greywater, and putrescible waste, results in an increased growth of primary producers such as phytoplankton (NERA, 2017). Deck drainage and bilge discharges may cause sub-lethal or lethal effects to zooplankton; however, these effects are expected to be limited to the proximity of the discharge point (Woodside 2008, 2014; Shell, 2009). Studies on the effects of changes in salinity and temperature on zooplankton observed copepods are more sensitive to lower salinities than higher and changes in temperature had weaker negative effects on survival when compared to changes in salinity (Karlsson et al. 2018; Hall & Lewandowska 2022). Plankton, including fish eggs and larvae, may be impacted by exposure to operational discharges. Due to their limited mobility, these species are more susceptible to such discharges and often lack the ability to move away from potential discharge plumes.	1					

ASPECT	ACTIVITY	IMPACT	IMPACT / CONSEQUENCE EVALUATION	SEVERITY LEVEL	DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
			Any potential change in phytoplankton or zooplankton abundance and composition is expected to be localised, typically returning to background conditions within tens to a few hundred metres of the discharge location (Parnell, 2003 cited in NERA, 2017). The intermittent and brief exposure of marine fauna to in-water operational discharge plumes will preclude chronic exposure which leads to mortality. As a result, mortality from operational discharges is not a credible event. Less mobile fish, such as syngnathids may be more vulnerable to increases in turbidity. At the population level, the consequence injury / mortality in a negligible number of syngnathids (given the absence of critical habitats and BIAs in the Operational Area) is not expected to increase mortality above that of natural levels. There are no BIAs for fish or marine turtles within the Operational Area, and therefore low numbers are expected, limiting the potential for exposure to discharge plumes. A migration BIA for Southern Right Whale and a foraging BIA for Pygmy Blue Whale do overlap the Operational Area. The Upwelling East of Eden KEF which overlaps the Operation Area, highlights the high-energy environment of the region, which means that marine mammals that regularly migrate and feed here are adapted to high natural variability of in-water turbidity. Given this adaptation to temporary increases in turbidity, plumes generated by operational discharges are not expected to have a discernible effect foraging behaviours or movement patterns of individuals, nor therefore at a population level. It is expected that any potential minor physiological impacts from planned operational would be temporary and localised given the transient nature of marine fauna, and dynamic distribution of plankton. The severity level (consequence) is assessed as **Slight (1).**						
Support activities	Cumulative Impacts		<u>Cumulative Impact</u> The Judith-2 operational area is on the western edge of the Gippsland Basin Area To Be Avoided surrounding the Esso Australia operated Gippsland Basin Joint Venture producing & non-producing assets. The planned short duration geophysical and geotechnical surveys, as detailed in this EP, are not considered to add to cumulative impacts to the greater Gippsland Basin, nor are any concurrent survey operations known presently. Specific to the drilling activity, the planned jack-up MODU to be used, would move to Emperor Energy following the completion of the ongoing campaign being conducted by Esso Australia on their Gippsland Basin assets. The closest offshore wind farm feasibility license (Navigator North) is approximately 35 km away from the Operational Area. This development was placed on hold by the operator in September 2025 with no survey or construction activities expected in the foreseeable future. No barriers to migration or movement of species were identified from activities conducted under this EP. Therefore, no cumulative impacts were identified.	N/A					

ASPECT	ACTIVITY	IMPACT	IMPACT / CONSEQUENCE EVALUATION	SEVERITY LEVEL	DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
EMISSIONS – ATMOSPHERIC									
Emissions – atmos-pheric	Drilling activities Support activities	Change in air quality	Air quality Atmospheric emissions are generated from flaring activities (maximum 42-hour duration), use of combustion engines on the MODU and vessels (24 hours a day for up to 60 days), embodied carbon of materials used, helicopter operations, and waste generation. Vessels within the Operational Area will include the geotechnical and geophysical survey vessels, the MODU and support vessels (towing vessels, PSC or multi-purpose support vessels). The MODU will be serviced by a helicopter with a flight frequency of up to 5 times per week. Atmospheric emissions from the activity includes non-greenhouse gases, such as NO_X and SO_X, and greenhouse gases (GHGs), such as CH_4, CO_2 and N_2O, and can lead to reduction in local air quality. Air quality within the Operational Area includes pre-existing combustion exhaust emissions from offshore marine users (commercial shipping and fishing vessels). Emissions of non-greenhouse gases will be generated by the combustion of fuel for power generation by vessels, MODU and helicopters. These emissions will be continuous from the MODU power generation systems during the activity and intermittent for vessels and helicopters. Modelling of NO_2 emissions from MODU power generation was completed for another offshore project (BP, 2013). Results of modelling highlighted impacts to air quality is limited to a localised airshed adjacent to the MODU (BP, 2013). Impacts to ecological and social receptors within or beyond the Operational Area are not predicted form non-greenhouse gas emissions, as a reduction in air quality is limited to within the immediate proximity of the release source and is temporary, as pollutants would be rapidly dispersed to the offshore airshed by prevailing winds (Tetra Tech Coffey, 2024). Therefore, impacts to marine fauna and social receptors from a change in air quality are not expected and have not been evaluated further. A GHG assessment was conducted to estimate the GHG emissions (scopes 1, 2 and 3) generated from the activity (APPENDIX E). Scope 1 emissions are the direct emissions generated from the activity; scope 2 are the indirect emissions from the consumption of purchased electricity, steam, heat or cooling purchased outside the boundary of the activity (in this case, there is no scope 2 emissions given no purchased electricity/energy); and scope 3 are the indirect emissions, other than the scope 2 emissions, generated as a result of the activity. GHG emissions contribute to global warming, impacting climate systems, ecosystems and social receptors (e.g. recreational fisheries and tourism that rely on ecological values). The International Panel on Climate Change (IPCC) (2023) Sixth Assessment Report (AR6) highlights that global warming and extreme climate events are attributable to climate change caused by human influence, with potential impacts to vulnerable ecosystems, such as coral reefs (e.g. from rising sea temperatures and ocean acidification). Australia's State of the Environment (SoE) report (DCCEEW, 2021) describes how climate change and	1	A	CM10: Green flare boom CM11: Measure and record fuel use CM08: Planned system maintenance CM03: Marine Assurance Process	Accepted: IFC EHS Guidelines - Offshore Oil and Gas Development (2015) for flaring activities [CM 4]	ALARP	Potential impacts from emissions – atmospheric are considered Acceptable having met all the acceptability criteria as follows: • Residual severity of slight (1) therefore will not contravene with the principles of ESD. • GHG emissions make up a very small proportion of the Australian carbon budget in 2025. • Flaring activities will be minimised by following IFC EHS Guidelines - Offshore Oil and Gas Development (2015) for flaring activities. • Control measures are consistent with good industry practice and demonstrated to reduce impacts to ALARP. • Relevant AGR standards and procedures used as controls • No stakeholder objections or claims raised. • Other requirements including relevant legislation have been identified and applied as controls with respective EPSs Implementing these control measures, as detailed in Section 5.10, will ensure the EPO3 is met. EPO3: Change to air quality will be limited to localised and temporary impacts within the Operational Area, such that there will be no impacts to amenity outside of the Operational Area. By meeting EPO3, it will ensure potential impacts will be at or below the defined Acceptable levels.

ASPECT	ACTIVITY	IMPACT	IMPACT / CONSEQUENCE EVALUATION	SEVERITY LEVEL	DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
			extreme weather events are impacting Australia's ecosystems and societies, and this is also summarised within the recent National Climate Risk Assessment (Australian Government, 2025). The total GHG emissions resulting from the activity are expected to be approximately 46 kt CO_2e, consisting of 56% and 44% of scopes 1 and 3 emissions, respectively. The total volume of GHG emissions for this activity is small (no more than ~0.011% of the Australian carbon budget in 2025). Given the minor contribution to carbon budgets, the emissions will not result in a major contribution to the effects of climate change on ecological or social receptors, and these will not be considered impacts, as per s527E of the EPBC Act. Atmospheric emissions from MODU and vessel operations and flaring will result in localised and temporary change in air quality immediately surrounding the discharge point within open-ocean offshore waters of the Operational Area during the activity and will make a minor contribution to global climate change. Given the localised impacts to air quality and the minor contribution to the Australian carbon budget for 2025 from the activity (0.0011%), the severity level (consequence) is assessed as Slight (1).						
Cumulative Impacts		Cumulative Impact	The Judith-2 operational area is on the western edge of the Gippsland Basin Area To Be Avoided surrounding the Esso Australia operated Gippsland Basin Joint Venture producing & non-producing assets. The planned short duration geophysical and geotechnical surveys, as detailed in this EP, are not considered to add to cumulative impacts to the greater Gippsland Basin, nor are any concurrent survey operations known presently. Specific to the drilling activity, the planned jack-up MODU to be used, would move to Emperor Energy following the completion of the ongoing campaign being conducted by Esso Australia on their Gippsland Basin assets. The closest offshore wind farm feasibility license (Navigator North) is approximately 35 km away from the Operational Area. This development was placed on hold by the operator in September 2025 with no survey or construction activities expected in the foreseeable future. No barriers to migration or movement of species were identified from activities conducted under this EP. Therefore, no cumulative impacts were identified.	N/A					

5.2.2. Impact and risk assessment – unplanned aspects

Table 5-3: Impact and risk assessment – unplanned aspects

					RISK ASSESSMENT				DEMONSTRATION OF ALARP			DEMONSTRATION OF ACCEPTABILITY
ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	SEVERITY LEVEL	LIKELIHOOD	RISK RATING	ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
UNPLANNED INTERACTIONS												
Physical presence – interaction with marine fauna	Support activities	Injury / mortality to marine fauna	Marine Fauna - Fishes	Fishes The physical presence of vessels in the Operational Area introduces the potential for vessel collision with marine fauna during the activity. Marine fauna that inhabits surface waters, are most at risk from vessel collision. There are no BIAs for fish that overlap the Operational Area. However, the PMST report does list several fish species, including sharks are being present within the Operational Area. Whale Shark are particularly vulnerable to vessel collision and routinely feed at the surface (CoA, 2017b). Studies have found that fauna mortality in the event of a vessel strike is directly linked to vessel speed (Jensen and Silber, 2004; Laist *et al.*, 2001) with severe injuries caused by vessels travelling faster than 14 knots. Vessels within the Operational Area will be either stationary or operating at slow speeds (<8 knots). Sharks are expected to exhibit avoidance behaviours prior to colliding with vessels. In the event of a vessel collision between a shark and vessel in the Operational Area, recoverable injury to sharks may occur. Death from vessel collision is not expected because vessel speeds within the Operational Area will be slow. If a shark to vessel collision resulted in the death of an EPBC Act listed shark species, it is not expected that a single individual would have a detrimental effect on the overall population, suggesting this event would result in a limited environmental impact. The severity level is assessed as **Slight (1)**. The presence of EPBC Act listed sharks in the Operational Area is limited to transitory individuals, thereby reducing the potential for vessel collision with marine fauna during the activity. The likelihood is assessed as **Rare (1)**. The risk rating for shark to vessel collision during the activity is ranked **Low (1)**.	1	1	1	A	**CM12:** EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans. **CM43:** Reporting and Recording	None identified	ALARP	Potential risks from physical presence – interaction with marine fauna are considered **Acceptable** having met all the acceptability criteria as follows: • Residual risk is Low therefore will not contravene with the principles of ESD. • Activity will not impact the recovery of EPBC listed species. • Control measures are consistent with good industry practice and demonstrated to reduce impacts to ALARP. • Legislative and other requirements have been identified and met, and guidelines considered: – National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna (CoA, 2017b) • No stakeholder objections or claims raised. • Other requirements including relevant legislation have been identified and applied as controls with respective EPSs Implementing these control measures, as detailed in Section 5.10, will ensure the EPO4 is met. **EPO4:** No death or injury to listed threatened or migratory species from the activity from vessel collision. By meeting EPO4, it will ensure potential impacts will be at or below the defined Acceptable levels.

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT			DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					SEVERITY LEVEL	LIKELIHOOD	RISK RATING	ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
	Support activities	Injury / mortality to marine fauna	Marine Fauna - Marine reptiles	<u>Marine reptiles:</u> Marine turtles surface to breathe and are potentially at risk from vessel collision (CoA, 2017a). There are three species of marine turtle identified as possibly occurring within the Operational Area, Green Turtle, Leatherback Turtle and Loggerhead Turtle. Vessel disturbance is recognised as a key threat to marine turtles in the Recovery Plan for Marine Turtles (CoA, 2017a). Increased boat traffic results in increased risk of serious injury and / or death to individual marine turtles (CoA, 2017b). The Recovery Plan for Marine Turtles highlights boat strike as an issue in shallow coastal foraging habitats and inter-nesting areas (CoA, 2017a). The Operational Area does not overlap BIAs including known foraging and inter-nesting areas for marine turtles and is in offshore open waters. Therefore, the presence of marine turtles in the Operational Area is anticipated to be transitory. The Operational Area contains pre-existing vessel traffic from offshore marine users (commercial shipping and fishing vessels). The physical presence of vessels in the Operational Area will not introduce a new threat to marine turtles in the area. Marine turtles are known to avoid vessels by rapidly diving; however, their ability to respond varies greatly depending on the speed of the vessel. Hazel (2009) reported that the number of turtles that fled vessels decreased significantly as vessel speed increased. Vessels within the Operational Area will be either stationary or operating at slow speeds (<8 knots), therefore marine reptiles are anticipated to avoid vessels within the Operational Area. Although the outcome can be fatal for individual turtles, boat strike (as a standalone threat) has not been shown to cause stock level declines (DoEE, 2017). Only a small number of vessels will be required for the activity and will be present within the Operational Area on a temporary and short-term basis only. The severity level is assessed as **Slight (1)**. The presence of EPBC Act listed marine reptiles in the Operational Area is limited to transitory individuals, thereby reducing the potential for vessel collision with marine fauna during the activity. The likelihood is assessed as **Rare (1)**. The risk rating for marine reptiles to vessel collision during the activity is ranked **Low (1)**.	1	1	1					
	Support activities	Injury / mortality	Marine Fauna -	<u>Marine mammals</u> Marine mammals surface to breathe and are therefore at risk from vessel collision. Vessel disturbance (strike / collision) is recognised as	1	1	1					

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT			DEMONSTRATION OF ALARP			DEMONSTRATION OF ACCEPTABILITY
					SEVERITY LEVEL	LIKELIHOOD	RISK RATING	ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
		to marine fauna	Marine mammals	a key threat for marine mammals that may swim through the Operational Area, which intersects a distribution and foraging BIA for the Pygmy Blue Whale and a migratory BIA for the Southern Right Whale. The PMST Report also identifies several threatened and migratory marine mammals that may overlap the Operational Area, including 4 threatened species (Blue Whale, Fin Whale, Sei Whale and Southern Right Whale and 11 migratory species (Antarctic Minke Whale, Blue Whale, Bryde's Whale, Dusky Dolphin, Fin Whale, Humpback Whale, Killer Whale, Pygmy Right Whale, Sei Whale, Southern Right Whale and Sperm Whale (Section 4.6.4). Marine mammals are inquisitive and are often attracted to offshore vessels. The reaction of whales to the approach of an offshore vessel is variable. Some species remain motionless when in the vicinity of a vessel while others are known to be curious and often approach ships that have stopped or are slow moving, although they generally do not approach, and sometimes avoid, faster moving ships (Richardson et al., 1995). Studies have found that fauna mortality in the event of a vessel strike is directly linked to vessel speed (Jensen and Silber, 2004; Laist et al., 2001). Vanderlaan and Taggart (2007) found lethal vessel collision injuries to marine mammals increases significantly with vessels travelling at 13-15 knots. Slower moving vessels provide greater opportunity for both fauna and vessel to avoid collision (Vanderlaan and Taggart 2007). Some marine mammal species, such as humpback whales, can detect and change course to avoid a vessel (WDCS, 2006). The Recovery Plans for Blue Whale and Southern Right Whale identify vessel strike as a threat to these species (DoE, 2015b; DCCEEW, 2022). Vessel collisions could impede the recovery of these species, if enough individuals in the population lose reproductive fitness or are killed (DoE, 2015b). Similarly, the conservation advice for Fin Whale and Sei Whale also list vessel strike as an increasing threat to these species, as the species' populations increase alongside an increase in vessel traffic (TSSC, 2015b; TSSC, 2015c). Vessels in the Operational Area will be either stationary or slow moving (<8 knots) during the activity; therefore, the risk of marine mammal mortality from collision and the event itself is classified as rare. Although the outcome of a vessel collision can be fatal, vessel collisions (as a standalone threat) are not expected to impede the recovery of marine mammal populations given that there will only be a small number of vessels in the Operational Area for a short								

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT: SEVERITY LEVEL	RISK ASSESSMENT: LIKELIHOOD	RISK ASSESSMENT: RISK RATING	DEMONSTRATION OF ALARP: ALARP DECISION CONTEXT	DEMONSTRATION OF ALARP: CONTROL MEASURES	DEMONSTRATION OF ALARP: ADDITIONAL CONTROL MEASURES CONSIDERED	DEMONSTRATION OF ALARP: ALARP OUTCOME	DEMONSTRATION OF ACCEPTABILITY: ACCEPTABILITY ASSESSMENT
				period of time, that will be either stationary or slow moving, removing the potential for vessel collisions to result in lethal injury. If an incident occurred, it would be restricted to individual fauna and not be expected to have impacts to local population levels. The severity level of a marine mammal to vessel collision is assessed as **Slight (1)**. The slow-moving vessels in the Operational Area will provide opportunity for both fauna and vessel to avoid collision. Marine mammals also can detect and change course to avoid vessel collisions. The likelihood of a vessel collision to a marine mammal is assessed as **Rare (1)**. The risk rating for marine mammal to vessel collision during the activity is ranked **Low (1)**.									
Support activities	Injury / mortality to marine fauna	Cultural heritage values and sensitivities		<u>Cultural heritage values and sensitivities</u> The intrinsic link between First Nations people and culturally significant species are understood to be based on First Nations obligations to care for the species (Weir, 2012). The management of culturally significant species is considered to be applied to the species at a population level. As a result, impacts to culturally significant species at a population level has the potential to disrupt the intrinsic link of First Nations people ability to care for culturally significant species. As discussed above, although the outcome of a vessel collision can be fatal, vessel collisions (as a standalone threat) is not expected to impede the recovery of marine fauna populations given vessels in the Operational Area will be either stationary or slow moving, removing the potential for vessel collisions to result in lethal injury. The severity level of a marine fauna to vessel collision is assessed as **Slight (1).** The slow-moving vessels in the Operational Area will provide opportunity for both fauna and vessel to avoid collision. The likelihood of a marine fauna to vessel collision is assessed as **Rare (1).** The risk rating for marine fauna to vessel collision during the activity is ranked **Low (1).**	1	1	1					
Unplanned introduction of IMS	Support activities	Change in ecosystem dynamics	Benthic habitats and communities	<u>Benthic habitats and communities</u> Ballast water discharges or biofouling from MODU, vessel operations and ROV operations within the Operational Area can lead to the introduction, translocation, and establishment of IMS and change ecosystem dynamics of benthic communities. Change in ecosystem dynamics from IMS is generally dependant on successful reproduction and establishment of IMS populations which	1	1	1	A	**CM15:** MO 98: Marine pollution – anti-fouling systems **CM16:** Australian Ballast Water	None identified	ALARP	Potential risks from unplanned introduction of IMS are considered **Acceptable** having met all the acceptability criteria as follows: • Residual risk is Low and therefore will not contravene with the principles of ESD.

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT			DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
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				leads to IMS colonisation within native ecosystems. Successful IMS invasion requires the following: • Colonisation and establishment of the pest species on a vector (e.g. vessel hull) in a donor region (e.g. home port). • Survival of the pest species on the vector during the voyage from the donor to the recipient region (e.g. Operational Area). • Colonisation (e.g. dislodgement or reproduction) of the marine species in the recipient region, followed by successful establishment of a viable new local population. The benthic habitat in the offshore Operational Area is expected to comprise of sandy substrate devoid of large epifauna except for introduced screw shells and sponges (CEE Consultants, 2003). Benthic communities in the offshore Operational Area, is expected to be limited to infauna communities related to sandy substrates highly represented within the Twofold Shelf bioregion (IMCRA, 1998). The Operational Area overlaps the Upwelling East of Eden KEF, which highlights the high-energy environment within the Operational Area from the presence of the dynamic eddies of the East Australian Current (CoA, 2015). IMS colonisation requires a suitable habitat in which to establish itself such as rocky and hard substrates or subsea infrastructure, especially with pre-existing biofouling. Open waters environments, with high levels of dilutions and dispersal are less susceptible to colonisation of IMS (Paulay et al., 2002). Natural dispersal barriers such as water currents and upwellings, extensive tracts of deep water, soft sediment or severe wave exposure limit successful reproduction and establishment of founder IMS populations (Forrest et al., 2009). Benthic habitats and communities of the Operational Area may be temporarily exposed to IMS from an unplanned introduction. If IMS successfully spread and establish, the socio-economic and ecological consequences can be severe. Furthermore, once established, IMS can also be difficult to eradicate. Nevertheless, colonisation, reproduction and spread of IMS is not expected given the absence of hard substrates and high-energy environment within the Operational Area. The Operational Area also does not overlap any threatened benthic communities, protected areas or KEFs with benthic habitats and communities were identified within the Operational Area. The potential change in ecosystem dynamics of non-threatened epibiota (introduced screw shells and sponges) and infauna communities highly represented within the bioregion will be					Management Requirements CM17: *National Biofouling Management Guidelines for the Petroleum Production and Exploration Industry* CM18: *Australian Biofouling Management Requirements* CM19: IMS Biofouling Risk Assessment Process CM43: Reporting and Recording			• Control measures are consistent with good industry practice and demonstrated to reduce impacts to ALARP. • Relevant AGR standards and procedures used as controls. • No stakeholder objections or claims raised. • Other requirements including relevant legislation have been identified and applied as controls with respective EPSs Implementing these control measures, as detailed in Section 5.10, will ensure the EPO5 is met. EPO5: No introduction of invasive marine species. By meeting EPO5, it will ensure potential impacts will be at or below the defined Acceptable levels.

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT: SEVERITY LEVEL	RISK ASSESSMENT: LIKELIHOOD	RISK ASSESSMENT: RISK RATING	DEMONSTRATION OF ALARP: ALARP DECISION CONTEXT	DEMONSTRATION OF ALARP: CONTROL MEASURES	DEMONSTRATION OF ALARP: ADDITIONAL CONTROL MEASURES CONSIDERED	DEMONSTRATION OF ALARP: ALARP OUTCOME	DEMONSTRATION OF ACCEPTABILITY: ACCEPTABILITY ASSESSMENT
				localised, with no long-term consequences. The severity level of unplanned introduction of IMS is assessed as **Slight (1)**. The benthic environment of the Operational Area contains natural dispersal barriers for IMS including soft sediments, upwellings and is considered a high-energy environment that is subject to frequent natural scouring events. The likelihood of unplanned introduction of IMS is assessed as **Rare (1)**. The risk rating for unplanned introduction of IMS during the activity is ranked **Low (1)**.									
	Support activities	Change in eco-system dynamics	Cultural heritage values and sensitivities	Cultural heritage values and sensitivities Changes to benthic habitats occurring at a widespread level, such as the introduction, establishment and spread of IMS, has the potential to change the cultural heritage values of benthic ecosystems in coastal environment that provide habitat for culturally significant species, and resources for First Nations people. As discussed above, the potential change in ecosystem dynamics of non-threatened epibiota (introduced screw shells and sponges) and infauna communities highly represented within the bioregion will be localised, with no long-term consequences. The severity level of unplanned introduction of IMS is assessed as **Slight (1)**. The benthic environment of the Operational Area contains natural dispersal barriers for IMS including soft sediments, upwellings and is considered a high-energy environment that is subject to frequent natural scouring events. The likelihood of unplanned introduction of IMS is assessed as **Rare (1)**. The risk rating for unplanned introduction of IMS during the activity is ranked **Low (1)**.	1	1	1					
ACCIDENTAL RELEASE												
Accidental release – hazardous materials	Support activities	Change in water quality	Water quality	Water quality Small quantities of hazardous materials (approximately 1 m^3 of liquid chemicals and hydrocarbons) may be accidentally released to the open-offshore waters of the Operational Area. Hazardous liquids are expected to rapidly disperse through the surface layer of water because of the high-energy environment within the Operational Area. The Operational Area overlaps the Upwelling East of Eden KEF, which highlights the high-energy environment within the Operational Area from the presence of the dynamic eddies of the East Australian Current (CoA, 2015). Previous studies on wastewater discharges, including hydrocarbons, show no elevation in levels above background concentrations in	1	1	1	A	**CM03:** Marine Assurance Process. **CM05:** AGR Chemical assessment procedure **CM20:** Bunkering procedures **CM21:** Drain management	None identified	ALARP	Potential risks from accidental release – hazardous materials are considered **Acceptable** having met all the acceptability criteria as follows: • Residual risk is Low and therefore will not contravene with the principles of ESD. • Activity will not impact the recovery of EPBC listed species. • Control measures are consistent with good industry practice and demonstrated to reduce impacts to ALARP

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT			DEMONSTRATION OF ALARP			DEMONSTRATION OF ACCEPTABILITY
					SEVERITY LEVEL	LIKELIHOOD	RISK RATING	ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
				proximity to the discharge point (Woodside, 2008; 2014; Shell, 2009). Given the energetic environment of the Operational Area, any exposure to hazardous materials above background levels would be limited in extent and duration, and any impact is expected to be localised and temporary with rapid recovery to ambient conditions following an accidental release. Existing pressures on the localised marine environment such as fishing, and shipping activities pose similar risks that result in localised and temporary water quality impacts. Emperor Energy will manage wastes, chemicals and hydrocarbons in accordance with best practice and in line with legislative requirements, reducing the potential for accidental spills or releases to the marine environment. Change in water quality within the high-energy environment of the Operational Area will be localised, with no long-term consequences. The severity level is assessed as **Slight (1)**. Prevention controls are in place to prevent the risk of accidental release of hazardous materials. The likelihood of accidental release of hazardous materials is assessed as **Rare (1)**. The risk rating for accidental release of hazardous materials during the activity is ranked **Low (1)**.					**CM22:** Spill containment **CM23:** Fire Fighting Foam Screening and Quarantine **CM43:** Reporting and Recording		• Relevant AGR standards and procedures used as controls. • No stakeholder objections or claims raised. • Other requirements including relevant legislation have been identified and applied as controls with respective EPSs, specifically including: o Convention for the Safety of Life at Sea 1974 (SOLAS) – specifically prohibition of the use or storage of firefighting foams containing Perfluorooctane sulfonic acid (PFOS) in effect in 2026. Implementing these control measures, as detailed in Section 5.10, will ensure the EPO6 is met. **EPO6:** No unplanned release of hazardous materials to the marine environment. By meeting EPO6, it will ensure potential impacts will be at or below the defined Acceptable levels.
Support activities	Injury / mortality to marine fauna	Marine Fauna	Marine Fauna Small quantities of hazardous materials (1 m^3 of liquid chemicals and hydrocarbons) may be accidentally released to the open-offshore waters of the Operational Area. Hazardous liquids may cause sub-lethal or lethal effects to zooplankton; however, these effects are expected to be limited to the proximity of the discharge point (Woodside 2008, 2014; Shell, 2009). Any potential change in phytoplankton or zooplankton abundance and composition is expected to be localised, typically returning to background conditions within tens to a few hundred metres of the discharge location (Parnell, 2003, cited in NERA, 2017). If other marine fauna passes directly through a release, any impacts are expected to be highly localised, any minor release of hazardous material is not expected to result in a change in the viability of the population of any species. Given the small volumes, short potential exposure time due to rapid dilution through wave and current action, impacts to marine fauna are not expected.	1	1	1				

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT			DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					SEVERITY LEVEL	LIKELIHOOD	RISK RATING	ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
				Injury / mortality to marine fauna within the Operational Area will be localised, with no long-term consequences. The severity level is assessed as **Slight (1)**. Prevention controls are in place to prevent the risk of accidental release of hazardous materials. The likelihood of accidental release of hazardous materials is assessed as **Rare (1)**. The risk rating for accidental release of hazardous materials during the activity is ranked **Low (1)**.								
Support activities	Change in water quality	Cultural heritage values and sensitivities		<u>Cultural heritage values and sensitivities</u> Impacts to water quality from exposure to hazardous materials has the potential to result in physical/tangible change to cultural heritage value of oceans and waterways. As discussed above, change in water quality within the high-energy environment of the Operational Area will be localised, with no long-term consequences. The severity level is assessed as **Slight (1).** Prevention controls are in place to prevent the risk of accidental release of hazardous materials. The likelihood of accidental release of hazardous materials is assessed as **Rare (1).** The risk rating for accidental release of hazardous materials during the activity is ranked **Low (1).**	1	1	1					
Accidental release – vessel collision	Support activities	Change in water quality	Water quality	<u>Water quality</u> A collision between two vessels in the Operational Area has the potential to rupture a fuel tank and discharge 280 m^3 Marine Diesel Oil (MDO) to surface waters. This impact could be caused by a navigational error or loss of position resulting in a high energy collision between a support vessel and another project or third-party vessel could result in hull damage and fuel tank rupture. Vessel grounding was not assessed as a credible risk as there are no emergent features within the Operational Area. Stochastic modelling predicted the maximum distance of floating oil at the moderate threshold (10 g/m^2) to extend 19 km from the release location (RPS, 2022). A high percentage (95%) is expected to evaporate when on the sea surface with only a small portion (5%) expected to persist and decay over time. The hydrocarbon EMBA for MDO is expected to be mostly limited to offshore open waters, with no floating oil exposure predicted for any receptor at any threshold, and only a small amount of shoreline accumulation in localised areas predicted above the moderate threshold (100 g/m^2) (RPS, 2022).	2	1	1	A	**CM01:** Ongoing consultation **CM02:** MODU PSZ **CM03:** Marine Assurance Process. **CM24:** SOPEP/ SMPEP **CM25:** AIS transceiver **CM26:** NOPSEMA-accepted MODU Safety Case Revision	None identified	ALARP	Potential risks from accidental release – vessel collision are considered **Acceptable** having met all the acceptability criteria as follows: • Residual risk is Low and therefore will not contravene with the principles of ESD. • Control measures are consistent with good industry practice and demonstrated to reduce impacts to ALARP. • Relevant AGR standards and procedures used as controls. • No stakeholder objections or claims raised. • Other requirements including relevant legislation have been identified and applied as controls with respective EPSs

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT: SEVERITY LEVEL	RISK ASSESSMENT: LIKELIHOOD	RISK ASSESSMENT: RISK RATING	DEMONSTRATION OF ALARP: ALARP DECISION CONTEXT	DEMONSTRATION OF ALARP: CONTROL MEASURES	DEMONSTRATION OF ALARP: ADDITIONAL CONTROL MEASURES CONSIDERED	DEMONSTRATION OF ALARP: ALARP OUTCOME	DEMONSTRATION OF ACCEPTABILITY: ACCEPTABILITY ASSESSMENT
				MDO is a light-persistent oil (classified as a Group II oil) with low density, pour point and dynamic viscosity. These characteristics indicate that a surface release of MDO will spread quickly when spilled at sea and thin out to low thicknesses, increasing the rate of evaporation. The volatile non-persistent compounds of MDO (making up 95% of MDO) is expected to evaporate over 3-4 days depending on wind conditions. The residual persistent compounds of MDO (5% of MDO) will be subject to more gradual decay through biological and photochemical processes (RPS, 2022). Residual MDO four days after release is expected to disperse through the surface layer of water because of the high-energy environment within the Operational Area. The Operational Area overlaps the Upwelling East of Eden KEF, which highlights the high-energy environment within the Operational Area from the presence of the dynamic eddies of the East Australian Current (CoA, 2015). Dispersion of residual MDO increases exposure available to microorganisms to attach to the surface of residual MDO for biodegradation to take place (ITOPF, 2022). These microorganisms are naturally present in marine environments, even before the occurrence of oil spills, and can break down hydrocarbons to water soluble compounds and eventually to carbon dioxide and water (ITOPF, 2022; Bacosa et al., 2022). Change in water quality from the accidental release of 280 m^3 of MDO within the high-energy environment of the Operational Area will be localised, with no long-term consequences. The severity level is assessed as **Minor (2)**. Prevention controls are in place to prevent the risk of accidental release from vessel collision. The likelihood of accidental release – vessel collision is assessed as **Rare (1)**. The risk rating for accidental release – vessel collision during the activity is ranked **Low (1)**.					**CM27:** NOPSEMA-accepted OPEP **CM28:** Operational & Scientific Monitoring Bridging Implementation Plan (OSM-BIP) **CM43:** Reporting and Recording			Implementing these control measures, as detailed in Section 5.10, will ensure the EPO7 is met. **EPO7:** No unplanned release of hydrocarbons to the marine environment By meeting EPO7, it will ensure potential impacts will be at or below the defined Acceptable levels.
	Support activities	Injury / mortality to marine fauna	Marine Fauna - Plankton	<u>Plankton</u> A collision between two vessels in the Operational Area has the potential to rupture a fuel tank and discharge 280 m^3 MDO to surface waters. Modelling predicted the maximum distance of floating oil at the moderate threshold (10 g/m^2) to extend 19 km from the release location (RPS, 2022). Therefore, any impacts to plankton are anticipated to be localised and not cause significant changes at a population level. Phytoplankton are typically not sensitive to oil, whereas zooplankton are (Hook et al. 2016). Water column organisms, such as	2	1	1					

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT: SEVERITY LEVEL	RISK ASSESSMENT: LIKELIHOOD	RISK ASSESSMENT: RISK RATING	DEMONSTRATION OF ALARP: ALARP DECISION CONTEXT	DEMONSTRATION OF ALARP: CONTROL MEASURES	DEMONSTRATION OF ALARP: ADDITIONAL CONTROL MEASURES CONSIDERED	DEMONSTRATION OF ALARP: ALARP OUTCOME	DEMONSTRATION OF ACCEPTABILITY: ACCEPTABILITY ASSESSMENT
				zooplankton, may be impacted by oil and gas via exposure through ingestion, inhalation and dermal contact (NRDA, 2012), which can cause immediate mortality or declines in reproduction (Hook et al., 2016). Lethal and sublethal effects on zooplankton include narcosis, alterations in feeding, development, and reproduction (Almeda et al., 2014). Plankton populations have evolved to respond to environmental perturbations by copious production within short generation times (ITOPF, 2011). They are known to have naturally high mortality rates (primarily through predation), however once water quality returns to ambient, plankton populations will return to previous conditions within weeks or months due to recruitment of plankton from surrounding waters. Injury / mortality to plankton within the Operational Area will be localised, with no long-term consequences. The severity level is assessed as Minor (2). Prevention controls are in place to prevent the risk of accidental release from vessel collision. The likelihood of accidental release – vessel collision is assessed as Rare (1). The risk rating for accidental release – vessel collision resulting in injury / mortality to plankton during the activity is ranked Low (1).								
	Support activities	Injury / mortality to marine fauna	Marine Fauna - Birds	Birds A collision between two vessels in the Operational Area has the potential to rupture a fuel tank and discharge 280 m^3 MDO to surface waters. Modelling predicted the maximum distance of floating oil at the moderate threshold (10 g/m^2) to extend 19 km from the release location (RPS 2022). A high percentage (95%) is expected to evaporate when on the sea surface with only a small portion (5%) expected to persist and decay over time. The maximum length of shoreline accumulation above the moderate threshold (100 g/m^2) is only predicted to be 1 km during winter conditions. The maximum volume of hydrocarbons ashore is predicted as 9.1 m^3 during winter conditions (RPS, 2022). The hydrocarbon EMBA for MDO is expected to be mostly limited to offshore open waters, with no floating oil exposure predicted for any receptor at any threshold, and only a small amount of shoreline accumulation in localised areas predicted above the moderate threshold (100 g/m^2) (RPS, 2022). Twenty two foraging seabird BIAs occur within the EMBA (moderate exposure) for MDO.	3	1	1					

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT: SEVERITY LEVEL	RISK ASSESSMENT: LIKELIHOOD	RISK ASSESSMENT: RISK RATING	DEMONSTRATION OF ALARP: ALARP DECISION CONTEXT	DEMONSTRATION OF ALARP: CONTROL MEASURES	DEMONSTRATION OF ALARP: ADDITIONAL CONTROL MEASURES CONSIDERED	DEMONSTRATION OF ALARP: ALARP OUTCOME	DEMONSTRATION OF ACCEPTABILITY: ACCEPTABILITY ASSESSMENT
				The seabird BIAs are limited to procellariforms such as albatrosses, petrels and shearwaters. Procellariforms have the potential to directly contact surface hydrocarbons given shearwaters rest on the sea surface and albatrosses and petrels feed by plunge-diving. Foraging seabirds may continue to forage within slicks. Direct contact with surface hydrocarbons during foraging will lead to damage to external tissues including skin and eyes, as well as internal tissue irritation in their lungs and stomachs (ITOPF, 2011). Oiling of seabird feathers affects their ability to thermoregulate resulting in hypothermia. A bird suffering from cold, exhaustion (resulting from fouling of plumage) may dehydrate, drown or starve (ITOPF, 2011; CoA, 2022). The absence of critical habitat or sensitive aggregation sites for EPBC Act listed birds within the EMBA (moderate exposure) for MDO ensures no impacts at the species population level. Seabirds with foraging BIAs in the EMBA (moderate exposure) for MDO are highly pelagic species and are unlikely to be impacted at a population level. Birds present in the area are anticipated to be transitory. Impacts to birds from surface hydrocarbon exposure because of a vessel collision is expected to be localised and temporary based on weathering properties of MDO. Due to the presence of foraging BIAs for EPBC Act listed bird species (Section 4.6.2), it is possible that a small number of bird mortalities may occur in the event they are present during the spill event, however no long term- or population level effects are expected to occur. Overall, the severity level is assessed as **Severe (3)**. Prevention controls are in place to prevent the risk of accidental release from vessel collision and contingency plans are in place in the event that a release does occur. The likelihood of accidental release – vessel collision is assessed as **Rare (1)**. The risk rating for accidental release – vessel collision resulting in injury / mortality to fishes during the activity is ranked **Low (1)**.							
	Support activities	Injury / mortality to marine fauna	Marine Fauna - Fishes	<u>Fishes</u> A collision between two vessels in the Operational Area has the potential to rupture a fuel tank and discharge 280 m^3 MDO to surface waters. Modelling predicted the maximum distance of floating oil at the moderate threshold (10 g/m^2) to extend 19 km from the release location (RPS, 2022). A high percentage (95%) is expected to evaporate when on the sea surface with only a small portion (5%) expected to persist and decay over time. The maximum length of shoreline accumulation above the moderate threshold (100 g/m^2) is	2	1	1					

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT			DEMONSTRATION OF ALARP			DEMONSTRATION OF ACCEPTABILITY
					SEVERITY LEVEL	LIKELIHOOD	RISK RATING	ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
				only predicted to be 1 km during winter conditions. The maximum volume of hydrocarbons ashore is predicted as 9.1 m^3 during winter conditions (RPS, 2022). The hydrocarbon EMBA for MDO is expected to be mostly limited to offshore open waters, with no floating oil exposure predicted for any receptor at any threshold, and only a small amount of shoreline accumulation in localised areas predicted above the moderate threshold (100 g/m^2) (RPS, 2022). BIAs for the White Shark and Grey Nurse Shark occur within the EMBA (moderate exposure) for MDO and the PMST Report identified several threatened and/or migratory species listed as potential present (Section 4.6.3). Habitat degradation (pollution) is listed as a threat in the recovery plans for the for the White Shark (CoA, 2013) and Grey Nurse Shark (CoA, 2014). The EMBA (moderate exposure) for MDO does not contain critical habitats or feeding aggregation areas for White Shark and Grey Nurse Sharks. The presence of White Shark and Grey Nurse Shark within the EMBA (moderate exposure) for MDO is therefore expected to be limited to transitory individuals that will not be subject to long-term hydrocarbon exposure. In the event of an accidental release of MDO from a vessel collision, fishes in the EMBA (moderate exposure) for MDO are susceptible to injury / mortality from exposure to hydrocarbons. The absence of habitat features or conditions for site-attached fishes in the EMBA (moderate exposure) for MDO limits potential risk to fishes from MDO exposure to transient individuals. Transient fish species are highly mobile and as such are not likely to suffer extended exposure to hydrocarbons (ITOPF, 2011). Pelagic species have wide-spread distribution ranges and are not likely to be severely impacted by a spill which has relatively limited spatial extent. A study by Claireaux et al. (2017) revealed seabass detect and avoid in-water dissolved hydrocarbons at concentrations of 3 to 15 ppb. Based on this study, it is expected that pelagic fishes can detect and avoid in-water hydrocarbons at concentrations below levels that would lead to chronic effects. Impacts to fishes from in-water hydrocarbon exposure because of a vessel collision is expected to be localised and temporary based on weathering properties of MDO. No long-term effects are expected, however exposure to a small number of EPBC Act listed fishes could occur in the event of an accidental MDO release following vessel collision. The severity level is assessed as Minor (2).							

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT: SEVERITY LEVEL	RISK ASSESSMENT: LIKELIHOOD	RISK ASSESSMENT: RISK RATING	DEMONSTRATION OF ALARP: ALARP DECISION CONTEXT	DEMONSTRATION OF ALARP: CONTROL MEASURES	DEMONSTRATION OF ALARP: ADDITIONAL CONTROL MEASURES CONSIDERED	DEMONSTRATION OF ALARP: ALARP OUTCOME	DEMONSTRATION OF ACCEPTABILITY: ACCEPTABILITY ASSESSMENT
				Prevention controls are in place to prevent the risk of accidental release from vessel collision. The likelihood of accidental release – vessel collision is assessed as Rare (1). The risk rating for accidental release – vessel collision resulting in injury / mortality to fishes during the activity is ranked Low (1).								
	Support activities	Injury / mortality to marine fauna	Marine Fauna - Marine reptiles	Marine reptiles A collision between two vessels in the Operational Area has the potential to rupture a fuel tank and discharge 280 m^3 MDO to surface waters. Modelling predicted the maximum distance of floating oil at the moderate threshold (10 g/m^2) to extend 19 km from the release location (RPS, 2022). A high percentage (95%) is expected to evaporate when on the sea surface with only a small portion (5%) expected to persist and decay over time. The maximum length of shoreline accumulation above the moderate threshold (100 g/m^2) is only predicted to be 1 km during winter conditions. The maximum volume of hydrocarbons ashore is predicted as 9.1 m^3 during winter conditions (RPS, 2022). The EMBA for MDO is expected to be mostly limited to offshore open waters, with limited shoreline accumulation (<1 km maximum length of shoreline at East Gippsland) predicted for localised areas above the moderate threshold (100 g/m^2) (RPS, 2022). No BIAs, nesting, inter-nesting areas or habitat critical to the survival of the species were identified for marine turtles in the hydrocarbon EMBA (moderate exposure) for MDO. Loggerhead, Green, Leatherback and Hawksbill turtles may occur within the hydrocarbon EMBA (moderate exposure) for MDO, according to the PMST Report. Only a small proportion of any marine reptile population is expected to be exposed to this EMBA. Light oils, such as unweathered MDO, expose marine reptiles to volatile PAHs which may result in breathing, sight, or gastro-intestinal injuries (CoA, 2017a). These injuries to marine reptiles can result in decreased health, starvation, increased stranding and decreased breeding condition (CoA, 2017a). Sudden high toxic contaminant load during pre-dive inhalations have caused instantaneous death to marine turtles (Shigenaka, 2021 cited in Yaghmour et al., 2022). Impacts to marine reptiles from surface hydrocarbon exposure because of a vessel collision is expected to be localised and temporary based on weathering properties of MDO. Impacts would be limited to transiting individuals, and no long-term effects are expected. However, impacts leading to death to individual EPBC Act	3	1	1					

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT			DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					SEVERITY LEVEL	LIKELIHOOD	RISK RATING	ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
				listed marine reptiles may occur. The severity level is assessed as Severe (3). Prevention controls are in place to prevent the risk of accidental release from vessel collision. The likelihood of accidental release – vessel collision is assessed as Rare (1). The risk rating for accidental release – vessel collision resulting in injury / mortality to marine reptiles during the activity is ranked Low (1).								
	Support activities	Injury / mortality to marine fauna	Marine Fauna - Marine mammals	<u>Marine mammals</u> A collision between two vessels in the Operational Area has the potential to rupture a fuel tank and discharge 280 m^3 MDO to surface waters. Modelling predicted the maximum distance of floating oil at the moderate threshold (10 g/m^2) to extend 19 km from the release location (RPS 2022). A high percentage (95%) is expected to evaporate when on the sea surface with only a small portion (5%) expected to persist and decay over time. The maximum length of shoreline accumulation above the moderate threshold (100 g/m^2) is only predicted to be 1 km during winter conditions. The maximum volume of hydrocarbons ashore is predicted as 9.1 m^3 during winter conditions (RPS, 2022). The EMBA for MDO is expected to be mostly limited to offshore open waters, with limited shoreline accumulation (<1 km maximum length of shoreline at East Gippsland) predicted for localised areas above the moderate threshold (100 g/m^2) (RPS, 2022). Migration and breeding BIAs for the Southern Right Whale, foraging BIAs for the Pygmy Blue Whale, foraging BIA for the Humpback Whale, and a breeding BIA for the Indo Pacific Spotted Bottlenose Dolphin occur within the EMBA (moderate exposure) for MDO. MDO is considered a light hydrocarbon that rapidly evaporates (RPS 2022). In the event of an accidental release of MDO, marine mammals are more likely to be exposed to volatile hydrocarbon fumes from ingestion or inhalation. Physical oiling of marine mammals from MDO is unlikely. The absence of hairs and the frequent sloughing of skin cells provide little opportunity for oil to adhere to cetacean bodies (Helm et al. 2015). Cetaceans do not drink large volumes of sea water and would not ingest much oil, and the their foraging strategies likely do not include scavenging on oil-killed prey, and the toxic volatile components of oil can dissipate quickly so exposure to toxins through inhalation may be minimal. (Helm et al., 2015).	3	1	1					

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT: SEVERITY LEVEL	RISK ASSESSMENT: LIKELIHOOD	RISK ASSESSMENT: RISK RATING	DEMONSTRATION OF ALARP: ALARP DECISION CONTEXT	DEMONSTRATION OF ALARP: CONTROL MEASURES	DEMONSTRATION OF ALARP: ADDITIONAL CONTROL MEASURES CONSIDERED	DEMONSTRATION OF ALARP: ALARP OUTCOME	DEMONSTRATION OF ACCEPTABILITY: ACCEPTABILITY ASSESSMENT
				In the event a marine mammal surfaces in fresh MDO surface slick, effects of hydrocarbon inhalation or ingestion may lead to hypothermia, organ dysfunction, congested lungs, damaged airways, emphysema, gastrointestinal ulceration and haemorrhaging, eye and skin lesions, and decreased body mass due to restricted diet (AMSA, 2022). The potential for population impacts to marine mammals following an MDO release would need to coincide with a migration event to result in exposure of many individuals. Southern Right Whale and Pygmy Blue Whale are pelagic (move freely in the oceans) and because of their migratory patterns, may only be occasionally affected by surface hydrocarbons (AMSA, 2022). Given the mobility and wide geographical distribution of marine mammals, only transient marine mammal individuals would be expected to surface in a area exposed to surface hydrocarbons, resulting in short-term and localised consequences, with no long-term population viability effects (Helm et al., 2015). Impacts to marine mammals from surface hydrocarbon exposure because of a vessel collision is expected to be localised and temporary based on weathering properties of MDO. No long-term effects are expected however impacts leading to injury to a small number of EPBC Act listed marine mammals may be expected due to the presence of BIAs (Section 4.6.4). The severity level is assessed as **Severe (3)**. Prevention controls are in place to prevent the risk of accidental release from vessel collision. The likelihood of accidental release – vessel collision is assessed as **Rare (1)**. The risk rating for accidental release – vessel collision resulting in injury / mortality to marine mammals during the activity is ranked **Low (1)**.								
	Support activities	Change to the functions, interests or activities of other users	Commercial fisheries and aquaculture	<u>Commercial fisheries and aquaculture</u> A collision between two vessels in the Operational Area has the potential to rupture a fuel tank and discharge 280 m^3 Marine Diesel Oil (MDO) to surface waters. Modelling predicted the maximum distance of floating oil at the moderate threshold (10 g/m^2) to extend 19 km from the release location (RPS 2022). A high percentage (95%) is expected to evaporate when on the sea surface with only a small portion (5%) expected to persist and decay over time. The maximum length of shoreline accumulation above the moderate threshold (100 g/m^2) is only predicted to be 1 km during winter conditions. The maximum	2	1	1					

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT			DEMONSTRATION OF ALARP			DEMONSTRATION OF ACCEPTABILITY
					SEVERITY LEVEL	LIKELIHOOD	RISK RATING	ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
				volume of hydrocarbons ashore is predicted as 9.1 m^3 during winter conditions (RPS, 2022). The hydrocarbon EMBA for MDO is expected to be mostly limited to offshore open waters, with limited shoreline accumulation (<1 km maximum length of shoreline at East Gippsland) predicted for localised areas above the moderate threshold (100 g/m^2) (RPS, 2022). Eight Commonwealth-managed fisheries have management areas that occur within the hydrocarbon EMBA (low exposure) for MDO. Commercial fishing has the potential to be impacted through exclusion zones associated with the hydrocarbon release, the release response and subsequent reduction in fishing effort. Exclusion zones may impede access to commercial fishing areas, for a short period of time. The precautionary exclusion from fishing grounds can be expected until water quality monitoring verifies the absence of residual hydrocarbons, as such providing confidence to consumers in fisheries tainting. Fishing areas may be closed for fishing for a short duration because of the risks of the catch being tainted by hydrocarbons. Concentrations of petroleum contaminants in fish and crustacean and mollusc tissues pose adverse human health effects, and until these products cleared by the health authorities, they could be restricted for sale and human consumption. Studies of laboratory trials or of fish collected after release events (including the Hebei Spirit, Macondo, Sea Empress, Montara spills) find evidence of elimination of PAHs in fish tissues returning to reference levels within two months of exposure (Challenger and Mauseth, 2011; Davis et al., 2002; Gagnon & Rawson, 2011; Gohlke et al., 2011; Jung 2011; Law 1997; Rawson et al., 2011). Change to the functions, interests or activities of commercial fisheries will be localised, with no long-term consequences. Impacts are assessed as **Minor (2)**. Prevention controls are in place to prevent the risk of accidental release from vessel collision. The likelihood of accidental release – vessel collision is assessed as **Rare (1)**. The risk rating for accidental release – vessel collision resulting in change to the functions, interests or activities of commercial fisheries during the activity is ranked **Low (1)**.							
	Support activities	Change to the functions,	Marine and coastal industry	Marine and coastal industry, and tourism and recreation:	2	1	1					

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT			DEMONSTRATION OF ALARP			DEMONSTRATION OF ACCEPTABILITY
					SEVERITY LEVEL	LIKELIHOOD	RISK RATING	ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
		interests or activities of other users	Tourism and recreation	A collision between two vessels in the Operational Area has the potential to rupture a fuel tank and discharge 280 m^3 MDO to surface waters. Modelling predicted the maximum distance of floating oil at the low threshold (1 g/m^2) to extend 168 km from the release location due to a small, isolated patch which had resurfaced near the NSW boarder during a simulation under summer conditions. Under winter conditions the maximum distance of floating oil at the low threshold (1 g/m^2) is predicted to extend only 28 km from the release location (RPS, 2022). The EMBA for MDO is expected to be mostly limited to offshore open waters, with limited shoreline accumulation (<1 km maximum length of shoreline at East Gippsland) predicted for localised areas above the moderate threshold (100 g/m^2) (RPS, 2022). Other marine users are expected to include commercial shipping, defence activities and recreational users. Following a hydrocarbon release other marine users are expected to be impacted largely by implementation of exclusion zones. Exclusion zones may impede access to areas, for a short period of time. Marine users in the area may be impacted by oiled/contamination of equipment and assets. Notably, commercial traffic may require water intake for system cooling and heating. In the event of a spill, it is anticipated that any oceanwater intakes will be closed off to prevent contamination and equipment damage. As there is limited shoreline contact (<1 km maximum length of shoreline at East Gippsland) most recreational fishing and other coastal recreation activities will be unaffected by an MDO release. Given the offshore location and volatility of MDO these any impacts would be largely perception issues associated with visible hydrocarbons. Following the Macondo well blowout in the Gulf of Mexico in 2010, recreational fishing harvests in 2011, 2012 and 2013 were recorded to exceed landings from 2007-09 (prior to the blowout) (BP, 2014), suggesting recovery of fish stocks and confidence that public perception in fish quality had been restored. Change to the functions, interests or activities of other users will be localised, with no long-term consequences. The severity level is assessed as **Minor (2)**. Prevention controls are in place to prevent the risk of accidental release from vessel collision. The likelihood of accidental release – vessel collision is assessed as **Rare (1)**. The risk rating for accidental release – vessel collision resulting in change to the functions, interests or activities of other users during the activity is ranked **Low (1)**.							

ASPECT	ACTIVITY	IMPACT	AFFECTED RECEPTOR	IMPACT / CONSEQUENCE EVALUATION	RISK ASSESSMENT			DEMONSTRATION OF ALARP				DEMONSTRATION OF ACCEPTABILITY
					SEVERITY LEVEL	LIKELIHOOD	RISK RATING	ALARP DECISION CONTEXT	CONTROL MEASURES	ADDITIONAL CONTROL MEASURES CONSIDERED	ALARP OUTCOME	ACCEPTABILITY ASSESSMENT
	Support activities	Change in water quality	Cultural heritage values and sensitivities	<u>Cultural heritage values and sensitivities:</u> Impacts to water quality from hydrocarbon exposure has the potential to result in physical/tangible change to cultural heritage value of oceans and waterways. The intrinsic link between First Nations people and culturally significant species are understood to be based on First Nations obligations to care for the species (Weir, 2012). The management of culturally significant species is considered to be applied to the species at a population level. As a result, impacts to culturally significant species at a population level has the potential to disrupt the intrinsic link of First Nations people ability to care for culturally significant species. As discussed above, impacts to species from surface hydrocarbon exposure because of a vessel collision is expected to be localised and temporary based on weathering properties of MDO. No long-term effects are expected however impacts leading to the death of marine fauna that may be culturally significant. The severity level is assessed as Severe (3). Prevention controls are in place to prevent the risk of accidental release from vessel collision. The likelihood of accidental release – vessel collision is assessed as Rare (1). The risk rating for accidental release – change in water quality resulting in a change in cultural heritage values and sensitivities is ranked Low (1).	3	1	1					

5.3. Higher Order Impacts and Risks

The ENVID identified impacts and risks that triggered one or more factors for evaluation at a higher level. These factors as detailed in Section 2.5 also relate to the need for either modelling or an in-depth literature review to support the impact and risk evaluation as a result of uncertainty. In these cases, a detailed higher order impacts and risks evaluation has been provided for:

- Physical presence – seabed disturbance (Section 5.4)
- Emissions – light (Section 5.5)
- Planned discharges – drill cuttings, and fluids (Section 5.6)
- Impulsive underwater noise emissions (Section 5.7)
- Continuous underwater noise emissions (Section 5.8)
- Accidental release – loss of well control (Section 5.9).

5.4. Physical Presence – Seabed Disturbance

5.4.1. Aspect Source

There are various pathways for seabed disturbance as a result of planned activities. Pathways of seabed disturbance from the activities are summarised below in Table 5-4.

Table 5-4: Pathways for seabed disturbance from planned activities

ACTIVITY	DESCRIPTION OF PATHWAY	PREDICTED IMPACT FOOTPRINT	TOTAL FOR ACTIVITY
Geotechnical surveys	Physical footprint from borehole sampling, PCPT and grab samples. Further detail regarding this activity is provided in Section 3.4.2.	• Borehole samples (including frame): 4 m^2 (4 samples of 4 m^2 each) • PCPT: 4 m^2 (4 samples of 4 m^2 each) • Grab samples: 25 m^2 (5 samples of 5 m^2 each)	56 m^2
MODU positioning	Positioning of the jack-up MODU will require placement of 3 spud-can footings on the seabed. Further detail regarding this activity is provided in Section 3.5.1.	Footprint of up to: • 549 m^2 (3 spud-can footings at 183 m^2 each)	549 m^2
Drilling and P&A	Drilling of the well will require disturbance of the seabed at the top-hole section of the well (36" diameter). Further detail regarding	Footprint of up to: • 0.09 m^2 (1 well of 36" diameter)	0.09 m^2

ACTIVITY	DESCRIPTION OF PATHWAY	PREDICTED IMPACT FOOTPRINT	TOTAL FOR ACTIVITY
	this activity is provided in Section 3.6.1.		
	Once well P&A is complete, the wellhead will be cut below the mudline, removing well infrastructure from the seabed. The cutting process produces metal shavings (swarf), some of which will remain on the seabed. Further detail regarding this activity is provided in Section 3.6.8.	Total footprint of up to 50 m^2.	50 m^2
ROV operations	Contingency for temporary parking of the ROV on the seabed. Further detail regarding this activity is provided in Section 3.7.3.	Footprint of up to 2 m^2	2 m^2
Total for the activities			~657 m^2

5.4.2. Impact Evaluation

5.4.2.1. Benthic Habitats and Communities

Seabed disturbance may cause a loss or change to benthic habitats and communities both directly from the geotechnical sampling and temporary placement of equipment and indirectly as a result of the resuspension and settlement of disturbed sediment. Seabed disturbance associated with drilling discharges is assessed separately below.

Based on surveys undertaken in proximity to the Operational Area (CEE Consultants 2003), the Operational Area is expected to comprise of sandy substrate, sparse epifauna (e.g. introduced screw shells and sponges) and infauna. No threatened benthic communities, protected areas or KEFs with benthic habitats and communities were identified within the Operational Area (Section 4.5.1).

Any loss or change in benthic habitats and communities resulting from the activity are anticipated to be localised and temporary, with recovery of benthic habitats expected following removal of infrastructure. Certain benthic species, such as sponges, can undergo a variety in reproductive techniques, allowing them to be efficient colonisers of hard marine surfaces (Butler, 2002). Dernie *et al.* (2003) demonstrated that the full recovery of soft sediment assemblages from physical disturbance could take between 64 and 208 days depending on disturbance intensity. Similarly, Ingole *et al.* (2013) and Bluhm (2001) cited in NERA (2018) suggests impacts to soft sediment communities are expected to be short-term, with conditions present to support re-colonisation and recovery. Given the highly localised nature of the seabed disturbance within the Operational Area, recovery would be expected in the short-term with no long-lasting changes to benthic habitats.

Indirect impacts associated with the resuspension and associated settlement of sediment is predicted to be temporary and localised around the area of disturbance. The impact to benthic communities from suspension and settlement of sediments is expected to be minimal given the open-ocean environment is expected to disperse or dilute suspended sediment quickly following disturbance. Sessile invertebrates are

particularly vulnerable to sedimentation because they are generally unable to reorientate themselves to mitigate a build-up of particulates. However, some sessile taxa such as sponges, and bivalves can filter out or physically remove particulates (Roberts *et al.*, 2006; Pineda *et al.*, 2016). Nevertheless, given the limited temporal and spatial scale of the activities, any disturbance is anticipated to localised and short-term, with recovery expected. Seabed disturbance is therefore considered a localised impact to non-threatened benthic fauna with no potential to impact MNES.

Overall, impacts to epibiota (e.g. introduced screw shells and sponges) and infauna communities highly represented within the bioregion will be localised, with no long-term consequences. The predicted severity level (consequence) to benthic habitats and communities from a change in habitats resulting from seabed disturbance activities has been evaluated as Slight (1).

5.4.2.2. Marine Fauna

Disturbance, injury or mortality to marine fauna, including marine invertebrates and marine fish, may occur as a result of seabed disturbance. This impact may be direct or indirect, as described above.

The marine invertebrates of relevance to the Operational Area include Abalone, Commercial Scallop, Giant Crab, Octopus, Pipi, SRL, and Squid (Section 4.5.1.1). None of these species have EPBC status. Additionally, although there are no fish BIAs that overlap the Operational Area, the PMST Report lists 38 fish species as possibly being present, including 7 threatened species: Blue Warehou, Eastern Gemfish, Harrison's Dogfish, Little Gulper Shark, Orange Roughy, Whale Shark, and White Shark. Additionally, the Operational Area also supports commercial important fisheries, including 4 SESSF Commonwealth-managed fisheries with reported activity between 2016 and 2024 and 2 Victorian State-managed fisheries which has been active between 2013 and 2024 (Section 44.8.1 4).

Some marine invertebrates (e.g. crustaceans and some molluscs) and most marine fish (except pipefish, pipehorses, seadragons and seahorses) are capable of avoiding seabed disturbance, and therefore sessile fauna are more vulnerable to this impact. Nevertheless, seabed disturbance will be temporary and highly localised and therefore expected to impact a small number of individuals only (if at all). Furthermore, as described above, recovery of benthic habitats is expected, alongside recolonisation of benthic assemblages, marine invertebrates and marine fish in impacted areas. Given the localised and temporary nature of seabed disturbance from geotechnical surveys and the temporary placement of equipment, no long-lasting impacts to the populations of marine fauna (including marine invertebrates and fish) are anticipated from any disturbance, injury or mortality impacts. The predicted severity level (consequence) to marine fauna from disturbance and injury/mortality resulting from seabed disturbance activities has been evaluated as Slight (1).

5.4.2.3. Marine and Coastal Industries – Defence (UXOs)

Section 4.8.3.4 and Figure 4-80 shows the locations of known UXO sites within the EMBA. The Operational Area does not overlap UXO potential areas.

Emperor Energy is committed to undertaking site surveys prior to MODU positioning and support activities. Site survey data will be used to identify seabed exclusion areas (including UXOs) which will be used to inform the final selection of MODU positioning and subsequent support activities. As a result, the implementation of control measures (Section 5.4.5) will ensure the prevention of interaction with UXO within the Operational Area during the activity.

The predicted severity level (consequence) for interaction with UXO resulting from seabed disturbance activities has been evaluated as Slight (1).

5.4.2.4. Cultural Heritage Values and Sensitivities

Seabed disturbance has the potential to change the cultural heritage value of submerged landscapes if that disturbance is widespread and the submerged landscapes within the area feature cultural values and sensitivities (as described in Section 4.9.6.1). As depicted in Figure 4-87, the Operational Area overlays a now

submerged Sea Country which is described in Section 4.9.6.1 and shown to have potentially supported First Nation occupation prior to sea levels rising ~12,000 years ago. However, investigations by Posamentier (2023) stated that any archaeological objects present on the palaeolandscape 18,000 years ago would not have been preserved in the ocean setting due to erosion from tidal currents and wave energy during transgression, with any remaining artefacts buried beneath deep marine sediments (Posamentier, 2023; Biosis, 2023).

Additionally, the Operational Area may contain intangible First Nations people's heritage value. Sea Country is an intrinsic value to First Nations people and many groups have a close connection to Sea Country, including ecosystems, species and resources. The First Nations people's values of marine ecosystems and species have the potential to change if there are impacts to ecosystem functioning and integrity or species population. However, given the depth of the well location, as shown in Figure 4-87, the Judith-2 well is unlikely to be located on culturally significant landscapes or previously inhabited areas as described in Section 4.9.6.1. The impact assessment includes the assessment of First Nations cultural heritage values and sensitivities identified during the desktop assessment (Section 4.9.6) and consultation with First Nation Groups, including Gunaikurnai people, who are the Traditional Custodians of the Sea Country where the Judith-2 Operational Area is located. There were no cultural values or sensitivities identified during consultation ([#402] APPENDIX D).

Emperor Energy is committed to avoiding and managing direct impacts to cultural heritage by undertaking ongoing consultation with First Nations people to inform them of values and sensitivities that may arise during the activity (Section 7.9). Emperor Energy is committed to using an appropriately qualified underwater archaeologist with familiarity with First Nations cultural landscapes and experienced in identifying tangible sensitive features from geophysical data (Section 5.4.5) and to undertake an underwater heritage assessment to identify submerged cultural heritage during the project site surveys. This is to protect, avoid, manage and mitigate where possible any potential impacts to intangible and tangible cultural values or sensitivities. Where avoidance is not possible, Emperor Energy will obtain a permit under s23 of the *Underwater Heritage Act 2018* and consult with GLaWAC before proceeding with the activity to minimise impacts to cultural heritage.

Whilst the activity has the potential to directly or indirectly impact the submerged landscape which may hold culturally significant features to First Nations tangible and/or intangible heritage values and sensitivities, no known underwater culturally significant sites, benthic communities, or protected areas were identified within the Operational Area (Section 4.5, Section 4.7.1 respectively). Seabed disturbance is likely located away from reported submerged cultural landscape features of cultural significance as shown in Figure 4-87 and described in Section 4.9.6. Furthermore, as described above, recovery of benthic communities and marine fauna is anticipated with no long-term impacts to Sea Country or impacts to ecosystem functioning and integrity of species or populations. Given the Operational Area and associated seabed disturbance is located away from reported culturally significant values and sensitivities, with no long-term impacts to marine fauna, the severity level (consequence) is assessed as Slight (1).

5.4.3. Cumulative Impacts

The Judith-2 operational area is on the western edge of the Gippsland Basin Area To Be Avoided surrounding the Esso Australia operated Gippsland Basin Joint Venture producing & non-producing assets. The planned short duration geophysical and geotechnical surveys, as detailed in this EP, are not considered to add to cumulative impacts to the greater Gippsland Basin, nor are any concurrent survey operations known presently. Specific to the drilling activity, the planned jack-up MODU to be used, would move to Emperor Energy following the completion of the ongoing campaign being conducted by Esso Australia on their Gippsland Basin assets.

The closest offshore wind farm feasibility license (Navigator North) is approximately 35 km away from the Operational Area. This development was placed on hold by the operator in September 2025 with no survey or construction activities expected in the foreseeable future.

No barriers to migration or movement of species were identified from activities conducted under this EP. Therefore, no cumulative impacts were identified.

5.4.4. ALARP Demonstration

Impacts from seabed disturbance are relatively well understood, supported by scientific literature and in situ observations. The activity is considered a standard operation, including resulting impacts and risks, given drilling activities in the Bass Strait are well practiced.

Review of the potential impacts from seabed disturbance have identified no conflicts with company values, partner interests, or significant stakeholder interests.

Based on these factors, Emperor Energy has assigned potential impacts from seabed disturbance as an ALARP Decision Context: Type A.

5.4.5. Adopted Control Measures

To sufficiently define good practice the consideration of additional control measures has been assessed as part of defining the adopted control measures to support the Type A decision for seabed disturbance.

Table 5-5 lists the adopted control measures to ensure potential impacts from seabed disturbance are reduced to ALARP.

Table 5-5: Adopted Control Measures: Seabed Disturbance

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
CM31: Site surveys (Geophysical survey only)	Geophysical site survey will be undertaken prior to finalising the approach path, well location and MODU position no later than 1 month before MODU positioning. Site surveys will identify whether the following seabed obstacles in the Operational Area are present so that they can be avoided: • sensitive benthic habitats (i.e. high relief outcrops and reefs, sponge beds, corals) • maritime archaeological heritage (i.e. shipwrecks) • submerged landscape which may hold culturally significant features to First Nations • tangible UCH values and sensitivities • UXOs. Appropriately qualified specialists, including suitably qualified benthic ecologist or similar, geophysical data analyst, and underwater archaeologist or equivalent specialist (e.g. Cosmos Archaeology, Extent Heritage, Fathom Archaeology) with familiarity with First Nations cultural landscapes and experience in identifying landscape features from geophysical data, and geophysical data analyst will be used to help identify the above listed seabed obstacles.

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
CM32: MODU move and positioning analysis (Drilling only)	A MODU move and positioning analysis shall be undertaken prior to the selection of the approach path, well location and MODU positioning location to ensure the following are avoided: • high relief outcrops and reefs • maritime archaeological heritage (i.e. shipwrecks) • tangible UCH • UXOs.
CM33: MODU move and positioning plan (Drilling only)	The MODU approach path, well location and MODU positioning location shall be within the Operational Area, avoiding seabed obstacles as identified in CM32.
CM34: Maintenance and removal of property (Drilling only)	Emperor Energy will meet the requirements of Section 572 of the OPGGS Act such that upon well abandonment, all subsea equipment shall be removed from the sea floor, with casing and conductor cut below the mudline and retrieved to surface.
CM01: Ongoing Consultation	Consultation will be undertaken in accordance with Chapter 7, including notifications for on-water activities (pre-start and cessation notification requirements) and ongoing consultations.

Table 5-6 lists the additional control measures and considers each against the principle of gross disproportionality between the sacrifice (cost, time, effort) of implementation and the reduction in risk or impact and environmental benefit.

Table 5-6: Consideration of Additional Control Measures

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
CM35: UCH analysis and unexpected finds protocol (Post-geophysical survey)	This control measure aligns with the obligations outlined in the UCH Guidelines (DCCEEW, 2024f) and as such, the moderately high costs of implementing this are outweighed by the benefit of complying with government guidelines. The associated EPS is provided below. In accordance with advice from Heritage Victoria during consultation and in line with the UCH Guidelines (DCCEEW, 2024f), a review of site survey data be undertaken by a suitably qualified and experienced maritime archaeologist or equivalent specialist (such as Cosmos Archaeology, Extent Heritage, Fathom Archaeology) with familiarity with First Nations cultural landscapes and experience in identifying landscape features from geophysical data in accordance with the requirements detailed in section VII of the UNESCO Manual for Activities Directed at Underwater	Yes

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
	Cultural Heritage (Maarleveld, Guerin, Egger 2013: 163-176) to identify UCH values in the area [VIC-HC-03; #414; #416]. In the event of the discovery of UCH during surveys or afterwards during data analysis, the following unexpected finds protocol will be enacted to ensure the protection provisions under all sections of the UCH Act [#414; #416]: • Activities that have the potential to impact suspected or known UCH must cease immediately. Records of the UCH including imagery, description and location must be retained. • The UCH must be reported to the activity Supervisor • Knowledge of the UCH location with an appropriate buffer, taking into consideration the nature and scale of the potential UCH and the activities that are to be managed. The UCH will be shared as part of the HSE induction and its location flagged in relevant procedures to ensure UCH is avoided and protected. • If the potential UCH appears to be First Nations UCH, Emperor Energy will notify the Minster through the Australasian Underwater Cultural Heritage Database (AUCHD) within 21 days of the discovery under s40 of the UCH Act and Heritage Victoria [#414; #416]. • If the potential UCH appears to be First Nations UCH, the appropriate First Nations peoples will be notified to determine whether it is UCH site, and if so, how the site will be managed. • If the potential UCH appears to be a shipwreck or aircraft wreck that is older than 75 years or is otherwise reportable under s40 of the UCH Act, Emperor Energy will notify the Minster through the Australasian Underwater Cultural Heritage Database (AUCHD) within 21 days of the discovery. • If the unexpected finds include the suspected discovery of First Nations human remains, Emperor Energy will notify: – The Australian Federal Police	

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
	– The Minister in accordance with s20 of the *Aboriginal and Torres Strait Islander Protection Act 1984*, with the locations of the remains, and advise that it may be appropriate to have a First Nations people representative during the assessment or handling of the remains. • Activities will not commence in the vicinity of the UCH object or site until written approval is provided by Emperor Energy, once the above procedure has been implemented, or where the potential UCH is confirmed not to be UCH.	
CM42 UCH disturbance risk management measures (Geotechnical survey and drilling)	The costs of implementing this control measure include the time of specialist consultants, administrative review, and potential minor scheduling allowance. These costs are low and predictable relative to the overall activity. The benefit is substantial. It provides legal authority for operations in proximity to UCH, ensures protection measures are formally documented and implemented, and prevents regulatory breaches that could result in stop work orders, penalties, or schedule delays far exceeding the modest cost of the permit process. This additional control also directly responds to stakeholder expectations and ensures the activity meets Commonwealth cultural heritage requirements. Given the low cost and high benefit, acquiring a permit under Section 23 when avoidance is not practicable is considered reasonably practicable and reduces the residual risk to ALARP. The associated EPS is listed below. If the UCH analysis identifies suspected or confirmed UCH within areas that cannot be fully avoided due to safety, geotechnical, or operational constraints, a permit will be sought under Section 23 of the UCH Act to lawfully undertake the activity.	Yes

5.4.6. Acceptability Determination

Potential impacts from seabed disturbance are considered acceptable based on meeting the acceptability criteria as defined in Section 2.7. Table 5-7 details the evaluation of the potential impacts against each acceptability criterion.

Table 5-7: Acceptability determination

ACCEPTABILITY CRITERIA	DETERMINATION
To meet the principles of ESD	Seabed disturbance was assessed to have a potential residual severity of Slight (1) which is not considered as having the potential to result in serious or irreversible environmental damage. Consequently, no further evaluation against the principles of ESD is required.
Internal context	The proposed management of the impact is aligned with the Emperor Energy HSE Policy (APPENDIX A). Activities will be undertaken in accordance with the Implementation Strategy (Section 8).
External context	There have been stakeholder claims regarding seabed disturbance which has led to the inclusion of an additional control and an impact assessment against the potential for UXO disturbance. In response to Heritage Victoria's recommendation to undertake both a historic UCH study and a submerged Aboriginal cultural heritage study using a qualified maritime archaeologist and appropriate specialists (APPENDIX D [#VIC-HV-03]), Emperor Energy has adopted a specialist-led UCH analysis that includes expert review of all site survey and geophysical data, identification of any potential UCH or submerged cultural landscapes, and definition of avoidance or buffer zones where required. While a full standalone historic UCH study and submerged Aboriginal cultural heritage study are not considered reasonably practicable given the absence of any known or suspected UCH within the Operational Area and the highly localised and temporary nature of seabed disturbance, the adopted maritime archaeologist led analysis achieves the same objective, ensuring UCH risks are identified and reduced to ALARP, and is therefore appropriate and proportionate to the residual level of risk. This recommendation has been included as an additional control (Table 5-6) and EPOs (Table 5-7). Stakeholder claim raised by DOD highlighted that UXO may be present on the seabed, and Emperor Energy must understand the risks associated [DOD-02]. This claim is addressed as part of impact assessment against the potential for UXO disturbance (Section 5.4.2.3).
Other requirements	Seabed disturbance will be managed in accordance with legislative requirements. Those related to this aspect include: • OPGGS Act • UCH Act Relevant legislative requirements that provide explicit actions against this aspect are detailed below. Emperor Energy considers the adopted control measures as detailed in Section 5.4.5 will manage the potential impacts from this aspect to ALARP and acceptable levels.

Requirement	Demonstration
OPGGS Act	CM 22: Maintenance and removal of property details how the activity will

ACCEPTABILITY CRITERIA	DETERMINATION	
	Section 572 details the requirements for removal of property will be met for the P&A activities.	comply with Section 572 of the OPGGS Act.
	UCH Act Any new suspected underwater cultural heritage sites identified through the archaeological review of the seabed surveys will be reported to the Australasian Underwater Cultural Heritage Database (AUCHD) within 21 days of the discovery.	CM 37: UCH analysis details how the activity will comply with the UCH Act.
Acceptability outcome	Potential impacts from seabed disturbance are considered Acceptable having met all the acceptability criteria as detailed above. Implementing the adopted control measures listed in Section 5.4.5 will ensure the following EPOs will be met: EPO8: Seabed disturbance will be limited to localised disturbance to benthic assemblages within the Operational Area , with no impacts to ecosystem function or services and no impacts to UCH. EPO9: Undertake ongoing engagement with relevant First Nations groups to ensure identified tangible and intangible UCH and potential risks to submerged landscapes and UCH remains current and is protected. By meeting the above EPOs, it will ensure potential impacts will be at or below the defined acceptable levels.	

5.5. Emissions – Light

5.5.1. Aspect Source

Light emissions from the activities are expected from:

- Support Activities - navigation and safety lighting from the MODU and vessels (continuous for the duration of the activities)
- Drilling Activities – flaring activities during well testing which will occur for approximately 48 hours per DST and 144 hours in total (Section 3).

See Sections 3.6 and 3.7 for further details on each of these activities.

5.5.2. Impact Evaluation

Vessels and the MODU will have external lighting required to support safe navigation and night-time operations. This lighting is typical for offshore vessels as those used for fishing and commercial shipping activities and will be temporary and localised as detailed in Section 3. Based on the precautionary threshold for light impacts to wildlife within the National Light Pollution Guidelines for Wildlife (the Guidelines) (DCCEEW 2023b) a Light EMBA of 20 km from the Operational Area was used to identify species, which

may be exposed to light emissions (Appendix B). This 20 km threshold provides a precautionary limit based on observed effects of sky glow on marine turtle hatchlings, demonstrated to occur at 15–18 km, and fledgling seabirds grounded in response to artificial light 15 km away (DCCEEW, 2023b).

Flare modelling, commissioned for the Beach Energy Offshore Project Proposal (OPP) (Beach, 2025a) was considered suitable for the Judith-2 well test, based on comparable maximum flow rates. Well testing (Section 3.6.7) for Judith is predicted to have a maximum flow rate of 60 MMscf/d. Modelling by Beach Energy (2025a) is based on a maximum flow rate of 65 MMscf/d and used a Flaring EMBA of 63 km. Based on this, a conservative Flaring EMBA of 63 km from the MODU (at the proposed well location) was used to identify species, which may be exposed to light emissions as a result of flaring activities (Appendix B).

Light emissions can cause a Change in Fauna Behaviour. This may include:

- Behaviour: Light emissions may result in a localised change to marine fauna behaviour, specifically birds and turtle species.
- Orientation: Species such as birds and marine turtles may use light from natural sources (the moon) at night. Where an artificial light source is brighter than the natural light source, this may override natural cues leading to disorientation.

5.5.2.1. Seabirds and shorebirds

Light emissions may result in a localised change to marine fauna's behaviour including seabirds and migratory shorebirds.

The National Light Pollution Guidelines for Wildlife (DCCEEW, 2023b) recommend undertaking a light impact assessment where important habitat for list species sensitive to light are located within 20 km of the light source. The guidelines detail that important habitats are those areas necessary for an ecologically significant proportion of a listed species to undertake important activities such as foraging, breeding, roosting or dispersal. The PMST report found ten foraging seabird BIAs which occur within the Light and Flaring EMBAs (Section 4.6.2).

The seabird BIAs are limited to albatrosses, petrels and one shearwater species. Seabirds are shown to be attracted to artificial lights on vessels and oil and gas facilities which makes them susceptible to be attracted to the MODU and vessel lighting. Vessel deck lights and spotlights have been recorded to attract numerous nocturnal birds at night, particularly on nights with little moon light or low visibility (Montevecchi 2006). Some of the listed species have a nocturnal component of their life history, therefore are at greater risk of negative impacts from light emissions (DCCEEW, 2023). However, light emissions may enhance the capability of nocturnal seabirds to forage at night (DCCEEW, 2023b) with MODU and vessel lighting expected to increase prey availability and extend nocturnal bird foraging activities.

The National Recovery Plan for Albatrosses and Petrels[5] (CoA 2022) identifies light emissions as a threat. However, it classifies marine infrastructure interactions (including those associated with artificial light) as having no risk category and affecting 'Nil' species within Australia's jurisdiction.

Based on general observations (Beach Energy 2025a), behavioural effects to transient foraging birds in the light EMBAs are expected to be limited to behavioural impacts such as attraction, extended foraging activities and resting on the MODU and vessels. However, based on the absence of critical habitat or sensitive aggregation sites for EPBC Act listed birds within the lighting EMBAs, ensures there will be no impacts to the listed species at a population level.

[5] https://www.dcceew.gov.au/sites/default/files/documents/national-recovery-plan-albatrosses-and-petrels-2022.pdf

There are no management or conservation plans for the short-tailed shearwater. No impacts to this species at a population level are expected from activities under this EP.

The Light EMBA does not overlap any of the distribution or migration areas as detailed within the National Recovery Plan for the Orange-bellied Parrot (DELWP, 2016). Therefore, impacts from light emissions resulting from the MODU or support vessels to the orange-bellied parrot are not expected. The Flaring EMBA overlaps ~10.2% of the infrequent non-breeding range but does not overlap any of the defined migration routes. The National Recovery Plan for the orange-bellied parrot (DELWP 2016) identifies that the behaviour of this species may be modified by the presence of barriers (such as illuminated structures and vessels. DELWP (2016) states that these impacts are greatest within migration routes, however, (Holdsworth (2006) notes that this statement is based on anecdotal evidence (Holdsworth 2006). Therefore, impacts to the orange-bellied parrot form flaring activities, which are limited and of a short duration (Section 3.6.7), are not expected.

Artificial lighting from the activity is unlikely to attract and/or affect the behaviour of birds at a population level. Behavioural impacts are expected to affect a small number of birds foraging through the light EMBAs.

5.5.2.2. Marine Reptiles

No BIAs or habitat critical to the survival of the species were identified for marine turtles in the light EMBAs, however, the PMST report (Appendix B) shows that the loggerhead, green, leatherback and hawksbill turtles may occur within the light EMBAs.

The Recovery Plan for Marine Turtles in Australia identifies light pollution as a high-risk threat to marine turtles because artificial light can disrupt critical behaviours such as adult nesting and hatchling orientation, sea-finding and dispersal (CoA, 2017a). Further, the Recovery Plan for Marine Turtles in Australia identifies oceanic currents and gyres as hatchling dispersal habitats (CoA, 2017a). Given, the absence of nesting beaches within the Flaring EMBA, impacts to marine turtles from flaring are not considered likely. The Light EMBA does not overlap coastal areas so impacts from routine MODU and vessels light emissions on coastal areas are not possible. Any impacts to turtle species from light emissions would be temporary (Section 3) affecting a small number of marine turtles passing through the light EMBAs.

Light emissions from the MODU, support vessels or flaring activities are unlikely to result in a change in fauna behaviour of seabirds, shorebirds or marine turtles at a population level. Behavioural impacts are expected to be localised affecting a small number of transient marine turtles or birds foraging through the light EMBAs, with no long-term consequences. Therefore, the predicted impacts to marine fauna resulting in a change in fauna behaviour from light emissions has been evaluated as Slight (1).

5.5.2.3. Coastal Communities

Light emissions from the Operational Area have the potential to impact coastal communities.

The 20 km Light EMBA does not overlap the coastline. Therefore, impacts resulting from light emissions from routine MODU and vessel activities are not possible.

Four coastal communities on the Victorian coast lie within the 63 km Flaring EMBA. Light emissions from short-term flaring activities (Section 3.6.7) are expected to have a negligible impact on these communities. Using light modelling from Beach Energy (2025a), the community modelled to receive the highest illuminance from flaring activities will be Marlo at <0.003 lux, which is less than a quarter moon illuminance (0.01 lux). Lakes Entrance, the largest settlement within the Flaring EMBA, may be exposed to <0.001 lux,

levels similar to new-moon (0.001 lux). Table 5-8 estimates the changes in light intensities due to the short-term flaring activities.

Table 5-8: Light-sensitive coastal communities within the light EMBAs and the associated light intensity

Receptor	Distance to Well Position (km)	Routine light EMBA (20 km)	Estimated Light Intensity (Lux)	Flaring EMBA (63 km)	Estimated Light Intensity (Lux)
Marlo	~39	×	<0.0001	✓	<0.003
Orbost	~50	×	<0.0001	✓	<0.002
Nowa Nowa	~61	×	<0.0001	✓	<0.001
Lakes Entrance	~57	×	<0.0001	✓	<0.001

As the 20 km Light EMBA does not extend to the coastline and the illuminance from the Flaring EMBA at the nearest coastal locations would be similar to natural ambient light below quarter-moon levels (0.01 lux), the impact from light emissions is likely to result in Slight (1) consequences to coastal communities.

5.5.2.4. Cultural heritage values and sensitivities: Marine fauna

First Nations cultural heritage values associated with Sea Country including ecosystems and species are considered based on their ecological values, food sources, and/or culturally significant totemic values. The First Nations people's values associated with marine ecosystems and species have the potential to be disrupted if there are impacts to ecosystem functioning and integrity or species population.

The intrinsic link between First Nations people and culturally significant species are understood to be based on First Nations obligations to care for the species (Weir, 2012). The management of culturally significant species is considered to be applied to the species at a population level. As a result, impacts to culturally significant species at a population level has the potential to disrupt the intrinsic link of First Nations people ability to care for culturally significant species. Culturally significant species such as whales, pinnipeds, seabirds and shorebirds are found within the region. First Nations people have a cultural obligation to care for marine fauna that reside within and migrate through Sea Country and ensure their habitat is sustained. Light emissions from project activities are unlikely to attract and/or affect the behaviour of marine fauna including birds and sea turtles at a population level. Behavioural impacts are expected to affect a small number of birds and turtles foraging through the routine Light EMBA. Behavioural change to marine fauna will be localised, with no long-term consequences. Impacts to cultural heritage values and sensitivities are assessed as Slight (1).

5.5.3. Cumulative Impacts

The Judith-2 operational area is on the western edge of the Gippsland Basin 'Area To Be Avoided' surrounding the Woodside-operated (previously operated by Esso until end of June 2026) Gippsland Basin Joint Venture producing & non-producing assets. The planned short duration geophysical and geotechnical surveys, as detailed in this EP, are not considered to add to cumulative impacts to the greater Gippsland Basin, nor are any concurrent survey operations known presently. Specific to the drilling activity, the planned jack-up MODU to be used, would move to Emperor Energy following the completion of the ongoing campaign being conducted by Woodside on their Gippsland Basin assets.

The closest offshore wind farm feasibility license (Navigator North) is approximately 35 km away from the Operational Area. This development was placed on hold by the operator in September 2025 with no survey or construction activities expected in the foreseeable future.

No barriers to migration or movement of species were identified from activities conducted under this EP. Therefore, no cumulative impacts were identified.

5.5.4. ALARP Demonstration

Impacts from light emissions are relatively well understood, supported by scientific literature and in situ observations. However, inherent variability in individual animal responses introduces a degree of uncertainty when predicting specific reactions. Light emissions from drilling activities in the Bass Strait are well practiced and there are no conflicts with company values, no partner interests, and no significant stakeholder interests.

Based on these factors, Emperor Energy has assigned potential impacts from light emissions as an ALARP Decision Context: Type A.

5.5.5. Adopted Control Measures

To sufficiently define good practice the consideration of additional control measures has been assessed as part of defining the adopted control measures to support the Type A decision for light emissions.

Table 5-9 lists the adopted control measures to ensure light emissions are reduced to ALARP.

Table 5-9: Adopted Control Measures: Light Emissions

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
CM36: Light Management Procedure (Drilling only)	A Light Management Procedure will be developed by appropriately qualified lighting practitioners, together with an appropriately qualified marine biologist or ecologist and will be implemented as per the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023b), and relevant species management plans. Under DCCEEW (2023b) the Light Management Procedure will consider: • EPBC Act listed species, recovery and wildlife conservation plans, approved conservation advice for listed threatened species. • State environmental legislation, regulations, and policy and guidance documents • Up-to-date scientific literature • Local and Indigenous knowledge resulting from stakeholder consultation The Light Management Procedure will address: • A review and risk assessment of existing lighting to minimise non-essential and outward facing lights but ensuring safety and navigational lighting plus safe work condition conditions are maintained.

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
	• Identify susceptible wildlife, including relevant biological characteristics and behaviour. • Procedures for managing grounded birds (including factoring in handling protocols in light of the bird flu virus that is spreading as of mid-2026). • Reporting and recording requirements for grounded birds including remote advice from Zoos Victoria Marine Response Unit (MRU) or equivalent. • The requirement for flaring activities to start in daylight hours where operational safety and testing requirements allow and do not present an unacceptable risk to personnel, property and the environment.
CM03: Marine Assurance Process (All activities)	The MODU and support vessels will adhere to navigational safety requirements under the *Navigation Act 2012* and associated Marine Orders, including but not limited to: • All vessels and the MODU shall meet the safety measures and emergency procedures of the AMSA MO 27 (Safety of navigation and Radio Equipment), and lighting meets the International Rules for Preventing Collisions at Sea (COLREGs) and industry standards). • All vessels and the MODU shall meet the navigation equipment, lighting, watchkeeping and radar requirements of the AMSA MO 30 (Prevention of collisions), internationally agreed measures for navigation, lights and signals to be used by a vessel).

Table 5-10 lists the additional control measures and considers each against the principle of gross disproportionality between the sacrifice (cost, time, effort) of implementation and the reduction in risk or impact and environmental benefit.

Table 5-10: Consideration of Additional Control Measures

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
IFC EHS Guidelines - Offshore Oil and Gas Development (2015) for flaring activities (Drilling only)	Although this drilling campaign is not a World Bank Group-financed project, the guidelines are considered to be achievable using existing technology at reasonable costs. As such, it is a feasible control measure. The associated EPS is provided below.	Accepted (CM37)

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
	Emperor Energy shall verify that the well test contractor will comply with IFC EHS guidelines with respect to maximising flaring efficiency, specifically: • Maintenance program to ensure maximum flare efficiency • Use of a reliable pilot ignition system • Minimum volume of hydrocarbons required for well testing to the flared and durations reduced to the extent practical.	
Do not flare	Would result in a reduction in light emissions. However, an inability to flow-test the target reservoir would result in a negative outcome of the appraisal program, failure to identify a commercial discovery and limit future development potential of the Judith field.	No
Limit or exclude vessel night-time operations.	Would result in a reduction in light emissions but it is not practicable to shut down all operations during night-hours considering all safety applications.	No
Limit flaring to daylight hours only	Would result in a reduction in light emitted at night from planned well-test flare. However, the impact of restricting flaring to daylight hours only considering operational costs of ~AUD$50k per hour and ~AUD$600k, per occurrence, will likely add 6 nights to the Project resulting in an approximate $3.2 million additional cost. Therefore, it is not considered feasible as costs outweigh the environmental benefits.	No
Limit flaring commencement to daylight hours only	Increased visibility of bird flocks prior to flaring commencement to reduce the risk of impact. Impact of delaying start to daylight hours may incur additional costs. However, staring operations in daylight hours may reduce the impacts to bird species. The timing of flaring events is ultimately determined by operational safety and testing requirements. Delaying flaring may present an unacceptable risk to personnel, property and the environment. The associated EPS is provided below. The requirement for flaring activities to start in daylight hours where operational safety and testing requirements allow and do not present an unacceptable risk to personnel, property and the environment	Accepted in part (included in CM36)
Change lighting types on MODU and	Could potentially reduce the adverse impacts of artificial light on certain fauna. However, navigation lighting and	No

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
vessels to those with less impact (e.g. use of motion sensors / timers, change colour of lights, reduced intensity and frequency of lighting)	minimum lighting for crew safety are mandatory and stipulated by law. Benefits considered to outweigh costs.	
Position the flare boom away from sensitive to avoid adverse impact during flaring.	Non-practicable, flare boom location is restricted/ limited based on MODU design. Due to size of MODU, no discernible difference in light emissions to localised light sensitive receptors.	No
Shield gas flare on the MODU	Shielding the flare would reduce the amount of artificial light reaching sensitive receptors during short-duration flaring. Enclosed flares designs are typically utilised onshore and their lightweight construction is not suitable for offshore conditions found in the Gippsland region. The significant additional costs and design complexity of an enclosed flare outweighs the benefits to this short-term activity.	No
Reduce gas flow rates to the flare	Flow rate will be restricted to 60MMscf/day flow rate, likely based upon mechanical constraints of the well test equipment. In addition, gas flow rates are determined by safe operational requirements with an evaluation of trade-offs indicating an unacceptable HSE risk associated with a reduction of flow rate. A reduction to flow rates is likely to result in only minor decrease in light emissions. The HSE trade-offs are considered grossly disproportionate to the benefit gained.	No

5.5.6. Acceptability Determination

Potential impacts from light emissions are considered acceptable based on meeting the acceptability criteria as defined in Section 2.7. Table 5-11 details the evaluation of the potential impacts against each acceptability criterion.

Table 5-11: Acceptability determination

ACCEPTABILITY CRITERIA	DETERMINATION
To meet the principles of ESD	Light emissions were assessed as having a Slight (1) impact severity level which is not considered as having the potential to result in serious or

ACCEPTABILITY CRITERIA	DETERMINATION
	irreversible environmental damage. Consequently, no further evaluation against the principles of ESD is required. Further, quantitative modelling has been undertaken to remove some of the scientific uncertainty associated with this aspect. As such, the activity is consistent with the principles of ESD.
Internal context	The proposed management of the impact is aligned with the Emperor Energy HSE Policy (APPENDIX A). Activities will be undertaken in accordance with the Implementation Strategy (Section 8).
External context	There have been no stakeholder objections or claims regarding light emissions.
Other requirements	Light emissions will be managed in accordance with legislative requirements. Those related to this aspect include: • *Navigation Act 2012* • National Light Pollution Guidelines for Wildlife (DCCEEW, 2023b) • National Recovery Plan for Albatrosses and Petrels (CoA, 2022) • Wildlife Conservation Plan for Seabirds (CoA, 2020c) • Wildlife Conservation Plan for Migratory Shorebirds (DoE, 2015a) • National Recovery Plan for the Orange-bellied Parrot (DELWP, 2016) • Recovery Plan for Marine Turtles in Australia, 2017-2027 (CoA, 2017a) • Approved Conservation Advice for Dermochelys coriacea (Leatherback Turtle) (DEWHA, 2008) • South-east Marine Region Profile (CoA, 2015) • South-east Marine Parks Network Management Plan (DNP, 2025) Relevant legislative requirements that provide explicit actions against this aspect are detailed below. Relevant conservation advice or management plans that identify artificial light as a threat but do not provide explicit requirements are not detailed below. Emperor Energy considers the adopted control measures as detailed in Section 5.5.5 will manage the potential impacts from this aspect to ALARP and acceptable levels.

Requirement	Demonstration
Navigation Act 2012 Appropriate lighting, navigation and communication to inform other users.	CM03: Marine Assurance Process ensures appropriate lighting, navigation and communication to inform other users.
National Light Pollution Guidelines for Wildlife (DCCEEW, 2023b) Infrastructure with artificial lighting that is externally visible should have	CM36: Light Management Procedure ensures the MODU and vessels apply best practice lighting practices.

ACCEPTABILITY CRITERIA	DETERMINATION	
	best practice lighting design implemented. Where there is important habitat for seabirds within 20 km of a project, an EIA should be undertaken.	A detailed impact assessment has been provided for seabirds and other light sensitive receptors in Section 5.5.2.
	Wildlife Conservation Plan for Seabirds (CoA, 2020c) Manage the effects of anthropogenic disturbance to seabird breeding and roosting areas. Ensure all areas of important habitat for seabirds are considered appropriately and consistently in the development assessment process.	A detailed impact assessment has been provided for seabirds and other light sensitive receptors in Section 5.5.2. No critical habitat or sensitive aggregation sites for EPBC Act listed birds are within the lighting EMBAs for the activity. The activity is therefore considered not inconsistent with the Wildlife Conservation Plan for Seabirds (CoA, 2020c).
	National Recovery Plan for the Orange-bellied Parrot (DELWP, 2016) Identifies illuminated boats and structures as a threat with the action of assess the risk from barriers on the migration route. With the action of manage threat if the risk rating warrants action.	A detailed impact assessment has been provided for the orange-bellied parrot in Section 5.5.2. The Light EMBA does not overlap any of the distribution or migration areas as detailed within the National Recovery Plan for the Orange-bellied Parrot (DELWP, 2016). The activity is therefore considered not inconsistent with the Wildlife Conservation Plan for Seabirds (CoA, 2020c).
Acceptability outcome	Potential impacts from light emissions are considered **Acceptable** having met all the acceptability criteria as detailed above. Implementing the adopted control measures listed in Section 5.5.5 will ensure the following EPO will be met: **EPO10:** Impacts to marine fauna from light emissions will be no greater than a localised** and temporary consequence to individuals, with no population level impacts. ** Localised as defined as the light EMBAs By meeting the above EPOs, it will ensure potential impacts will be at or below the defined acceptable levels.	

5.6. Planned Discharges – Drill Cuttings, and Fluids

5.6.1. Aspect Source

Planned discharges – drill cuttings and fluids are expected from:

- Drilling Activities – management of drilling fluids, cuttings and discharges during well construction.
- Well Plug, Abandonment and Removal – cutting of the wellhead discharging metal swarf.

Section 3.6.3 provides details on the method of discharge for drill cuttings and fluids. Table 3-5 lists the fluid types, fluid volumes, cuttings volumes and discharge location for the planned discharges of drill cuttings and fluids.

For further details on the discharge of metal swarf refer to Section 3.6.8.

5.6.2. Impact Evaluation

5.6.2.1. Water Quality

Drill cuttings and fluid discharges released during well construction, will result in localised and temporary changes to the water quality, causing a temporary increase in turbidity in the water column around the wellhead at the seabed or at the sea surface.

A total of ~373 m^3 of drill cuttings and ~1,969 m^3 of WBM fluids (Table 3-5) will be discharged at the seabed and below water surface (from the MODU). No long-term or continuous discharge of drill cuttings and fluids is planned. The AGR chemical assessment procedure will ensure chemicals meet the criteria of the AGR Chemical Assessment Process.

Water quality within the Operational Area is expected to represent the high-water quality found in offshore Victorian waters. Planned discharges of drill cuttings and fluids at the seabed and below water surface will increase turbidity and may introduce chemical contaminants in the water column. Discharged drill cuttings and fluids are expected to contain crushed sedimentary rock particles and additives including lubricants, detergents, emulsifiers, defoamers, foaming agents, bactericides and corrosion inhibitors (Jones *et al*. 2021). Most additives discharged will contain pre-hydrated bentonite (a viscosifier), barite (a weighting agent), and potassium chloride (to inhibit clay hydration) (Jones *et al.*, 2021). Crecelius *et al.* (2007) recorded the solubility of barite and trace metal compounds and observed that 1% of mercury and 15% of the cadmium dissolved from the barite after one week of exposure to the marine environment, indicating their low bioavailability (Schanning *et al.* 2002). Furthermore, the concentrations of these components within barite are so low (Sadiq *et al.*, 2003) that Barite is referred to as inert from a toxicological perspective (Crecelius *et al.*, 2007). As such these will not result in contamination impacts, given the low concentrations and subsequent bioavailability.

Discharged drill cuttings and fluids are expected to disperse rapidly within the offshore marine environment, resulting in a relatively small footprint of water quality change. Hinwood *et al*. (1994) and Neff (2005) note that within 100 m of the discharge, a drill cuttings and fluid plume released at the surface will have diluted by a factor of at least 10,000. Neff (2005) further states that in well-mixed oceans, drill cuttings and fluid plume is diluted by more than 100-fold within 10 m of the discharge. The Upwelling East of Eden KEF, which intersects with the Operational Area, highlights the high-energy environment within the Operational Area from the presence of the dynamic eddies of the East Australian Current (CoA 2015). A study conducted in the North West Shelf modelled and surveyed the fate of drill cuttings and fluids for three wells with a total discharge volume of 1,543 m^3 (Jones *et al*., 2021). The study found sporadic and intermittent total suspended solids (TSS) concentrations up to 10 mg L^{-1} ~1000 m from the discharge point lasting over a period of minutes for each discharge event (Jones *et al.* 2021). In context, during cyclones and storms TSS concentrations of tens or hundreds of mg L^{-1} over a few hours are common in tropical shallow water reef environments (Abdul Wahab *et al.*, 2017; Fisher *et al.*, 2015 cited in Jones *et al*., 2021). Any increased turbidity levels are expected to be temporary and in close proximity to the source. Furthermore, environmental

impacts to water quality are considered to be low due to the intermittent and temporary nature of the discharges and composition (e.g. rock and water-based fluids).

Change in water quality within the high-energy environment of the Operational Area will be localised, with no long-term consequences and the severity level (consequence) is assessed as Slight (1).

5.6.2.2. Sediment Quality

Well design discharges released at the seabed, or those that settle on the surrounding seabed, have the potential to change sediment quality. A total of ~2,273 m^3 of drill cuttings and fluids will be discharged, ~947 m^3 at the seabed and ~1,395 m^3 below water surface. Given the water depths in the Operational Area and highly mixed environment, it is not considered likely discharges from the below water surface (MODU) are likely to cause any impact to water quality (see Section 5.6.2.1).

Sediment quality within the Operational Area is expected to be of high quality with low background concentrations of trace metals and organic chemicals. The closest previously drilled well is the Judith-1 well (located 2 km SE) which was drilled by Esso Australia Ltd. In 1990, and the Kipper well (located 6 km SE) which was drilled by Esso Australia Ltd. in 1986. Any changes to sediment quality from these previously drilled wells are not expected to remain, given the recovery rate of sediments to marine discharges.

Seabed discharge of drill cuttings and fluids will reduce sediment quality within the footprint of the discharge. Field studies of drill cuttings and fluids discharge (Sanzone *et al.*, 2016), found elevated seabed barium concentrations within 10 – 150 m of the discharge point. A review of drilling waste discharges from oil and gas platforms found elevated seabed barium concentrations up to 1,000 and 3,000 m from the platforms (Ellis *et al.* 2012).

It is proposed that the well will be drilled with WBM drilling fluid, which comprises of chemicals that pose little or no risk to the environment (OSPAR Commission, 2012). The primary constituents used in WBM are barite and bentonite, which lead to elevated levels of barium in drill cuttings. Dissolved barium and any heavy metal contaminants in the barite can gradually leach from an anoxic cuttings pile (Neff, 2005). Additional chemicals of environmental concern, due to their potential toxicity and persistence, that might be present in some drilling mud barites include cadmium (Cd), chromium (Cr), copper (Cu), mercury (Hg), lead (Pb), and zinc (Zn). These are primarily insoluble mineralized sulfide salts in the barite (Neff, 2008).

Available studies investigating sediment quality impacts from the release of drill cuttings and fluids indicate that within the first couple of years post-drilling, concentration of drilling components are expected to decrease by up to 80% from natural dispersive and degradative processes influenced by the high energy environment in the operational area (Sanzone *et al.*, 2016). Therefore, changes to sediment quality due to drilling discharges from the project are expected to be temporary and localised within close proximity of the source.

The cutting process during well P&A produces metal shavings (swarf), some of which remain on the seabed and possibly the sediment quality in the impacted area (50 m^2). Swarf would be expected to deposit quickly on the seabed immediately around the well. As only one wellhead will be cut and removed, only a small volume of swarf is expected to be produced.

Changes to sediment quality will pose little or no risk to the environment. Sediments in the Operational Area are widely represented of those in the Twofold Shelf bioregion. Discharges of drill cuttings and fluids including swarf will be short-term, limited to the duration of the drilling activity and localised (within a radius of 3 km). Therefore, the severity level (consequence) of the impact of drill cuttings and fluids on sediment quality is assessed as Slight (1).

5.6.2.3. Benthic Habitats and Communities

Discharges of drill cuttings and fluids can smother or change benthic epifauna and infauna communities leading to a change in habitat. This change in habitat will be limited to the immediate vicinity around the well location.

Benthic habitat in the offshore Operational Area, is expected to comprise of sandy substrate devoid of large epifauna except for introduced screw shells and sponges (CEE Consultants 2003). Benthic communities in the offshore Operational Area, are expected to be limited to infauna communities related to sandy substrates highly represented within the Twofold Shelf bioregion (IMCRA 1998). The Operational Area does not overlap any threatened benthic communities, protected areas or KEFs with benthic habitats and communities.

Fauna surveys surrounding the drill centres of three wells in the North West Shelf found a high impact zone within a 75 m radius of the well impacted by seabed discharges from tophole drilling (Jones *et al.*, 2021). The high impact zone was largely devoid of all epibenthic fauna and showed a clear loss of soft corals, sponges, and hydroids (Jones *et al.*, 2021). A medium impact zone, within 200 m of the well, found sponges and soft corals covered by sediment (Jones *et al.*, 2021). Drill cuttings will add to the unconsolidated substrates and will redistribute over time influenced by the surrounding morphology, currents, prevailing weather and would not be expected to significantly alter the overall character of the seabed, or its ecological amenity. Previous studies on cuttings dispersion around Gippsland Basin platforms indicate that the seabed dispersion process in eastern Bass Strait aids in reducing smothering and accelerating recovery. A study at the Snapper platform (55m depth) (Coffey, 2010) found, five months post-drilling, that cuttings accumulation was localized within 100 m of the platform. ROV inspections revealed recolonization by benthic infauna, with numerous burrows and bioturbation mounds observed in both natural sediments and cuttings.

Discharged drill cuttings and fluids will contain additives including lubricants, detergents, emulsifiers, defoamers, foaming agents, bactericides and corrosion inhibitors (Jones et al. 2021). The AGR Chemical Assessment Process will be used to ensure that all components of the WBM are classified PLONOR, which will minimise acute and chronic toxicity risks to fauna including benthic organisms.

Barite, a key component in all drilling muds stabilizes boreholes and controls pressure, leading to elevated barium levels in cuttings. Additionally, cuttings and swarf may contain other potentially toxic metals such as arsenic, chromium, cadmium, copper, iron, lead, mercury, nickel, and zinc, which are present in drilling muds (Breuer et al., 2004). Barite is the most abundant solid in cuttings and is highly insoluble in seawater. Modern WBMs use barite from sources with significantly lower trace metal content than in the past, resulting in metal concentrations similar to fine-grained marine sediments. While barite does contain mercury, studies indicate it is present as sulphide minerals, not as a substitution within the barite crystal lattice (Trefry & Smith, 2003). Field monitoring studies in Bass Strait and globally have assessed drilling discharge impacts. In stable cuttings piles with minimal disturbance, the dissolved, bioavailable metal fraction remains low.

Dernie et al (2003) conducted a study that identified sand-dominated communities had the most rapid recovery rate following disturbance. A survey of the recovery of deep-water megabenthic assemblages found partial megabenthic recovery between 3- and 10-years post-drilling (Jones *et al.* 2012). Sponges have cleaning mechanisms to remove sediments from their surfaces including mucus production, tissue sloughing, self-cleaning surfaces (Pineda *et al.* 2017).

Based on the low overall ecotoxicity associated with WBM drilling fluids any effects are anticipated to be minimal, with recovery expected within a few years after drilling (Sanzone *et al.* 2016). Furthermore, any

decreased abundance or biomass of epifauna associated with the smothering of sedimentation of drill cuttings and fluids will be localised and recoverable, with no threat to EPBC Act listed threatened fauna. Therefore, the predicted severity level (consequence) to benthic habitats and communities from drill cuttings and fluids resulting in a change to habitats has been evaluated as Slight (1).

5.6.2.4. Marine Invertebrates

Marine invertebrates are also potentially sensitive to potential smothering or burial caused by the release of drill cuttings and fluids. The marine invertebrates of relevance to the Operational Area include Abalone, Commercial Scallop, Giant Crab, Octopus, Pipi, SRL, and Squid (Section 4). None of these species have EPBC status. Additionally, the Ocean Scallop State-managed fishery overlaps the Operational Area, which has been active between 2013 and 2024 (Section 4).

Sessile marine invertebrates are most vulnerable to smothering impacts, as these species are not capable of avoiding higher sediment loads in the same way that mobile fauna can. However, as described above, available evidence suggests that cuttings accumulation will remain in close proximity to the well, with recovery of benthic habitats anticipated.

As described above, drill cuttings and fluids may contain additives, such as lubricants, detergents, emulsifiers, defoamers, foaming agents, bactericides and corrosion inhibitors (Jones *et al*. 2021). The well will be drilled exclusively with water-based drilling fluid comprising of chemicals that PLONOR to the environment (OSPAR Commission 2012).

Based on the low overall ecotoxicity associated with WBM drilling fluids, any effects are anticipated to be minimal, with recovery expected within a few years after drilling (Sanzone *et al.*, 2016). Furthermore, any injury/mortality to marine invertebrates, associated with the smothering of sedimentation of drill cuttings and fluids will be localised and recoverable, with no threat to EPBC Act listed threatened fauna. No long-term consequences to the population of marine invertebrates is anticipated. Therefore, the predicted impacts severity level (consequence) to marine invertebrates from injury/mortality associated with the release of drill cuttings and fluids has been evaluated as Slight (1).

5.6.2.5. Plankton

Once the riser and BOP is installed, drill cuttings will be discharged below surface and drill fluids will be recirculated at the surface (Table 3-5). The volume of planned drilling discharges will be limited and discharged intermittently over short durations.

The Operational Area overlaps the Upwelling East of Eden KEF, which highlights high primary productivity within the Operational Area with the presence of the phytoplankton blooms and zooplankton (CoA, 2015).

The Upwelling East of Eden KEF also highlights the high-energy environment within the Operational Area from the presence of the dynamic eddies of the East Australian Current (CoA, 2015). The dynamic eddies of the East Australian Current cause episodic mixing and nutrient enrichment events which will, over time, aid in the dispersion of discharged drilling solids and fluids.

Early life stages of fish and other plankton, including embryos and larvae, are most vulnerable to potential toxic exposure from drilling fluids and cuttings due to their limited mobility and susceptibility to the discharge plume at the outfall. High energy oceanographic processes at the well location will result in rapid dispersion of total suspended sediments from surface discharge of drill cuttings and fluids. Rapid dispersion of TSS and the transient nature of plankton, fish eggs and larvae reduces the likelihood of prolonged exposure. Furthermore, rapid recovery is anticipated following cessation of activity, given that during the early life stages, these species have a high natural mortality and rapid replacement rates (UNEP, 1985).

Consequently, exposure of planktonic communities is not expected to cause significant population-level impacts that would affect ecological diversity or productivity within Commonwealth marine areas. Therefore, any potential environmental impact associated with this activity is considered localized and limited.

The well will be drilled exclusively with WBM, which comprises of chemicals that pose little or no toxicity to marine organisms (OSPAR Commission, 2012; Neff, 2005). Its low toxicity and bioaccumulation potential, limit discharge impacts to localized areas, preventing food web contamination (Neff, 2010).

The high-energy environment within the Operational Area will result in rapid dispersion of discharged cuttings and fluids. Chemical levels in the water column will return to pre-disturbance levels once dispersion has occurred, with no long-term effects to localised water quality. Injury / mortality of plankton and fish (eggs and larvae) will be localised, with no long-term consequences. The severity level (consequence) is assessed as Slight (1).

5.6.2.6. Fish, Marine Reptiles and Marine Mammals

Mobile fish, marine reptiles and marine mammals are expected to experience minimal chemical exposure for brief durations when swimming near the discharge plume. Therefore, transient species are not anticipated to exhibit acute or chronic effects.

Less mobile fish, such as syngnathids may be more vulnerable to this impact. At the population level, the consequence injury / mortality in a negligible number of syngnathids (given the absence of critical habitats and BIAs in the Operational Area) is not expected to increase mortality above that of natural levels.

There are no BIAs for fish or marine turtles within the Operational Area, and therefore low numbers are expected, limiting the potential for exposure to discharge plumes. A migration BIA for Southern Right Whale and a foraging BIA for Pygmy Blue Whale overlap the Operational Area.

The Upwelling East of Eden KEF which overlaps the Operation Area, highlights the high-energy environment of the region, which means that marine mammals that regularly migrate and feed here are adapted to high natural variability of in-water turbidity. Given this adaptation to temporary increases in turbidity, plumes generated by drilling discharges are not expected to have a discernible effect foraging behaviours or movement patterns of individuals, nor therefore at a population level.

As described previously, the WBM drilling fluids are considered to be of a low toxicity with limited bioavailability. Neff (2010) concludes that, due to a lack of overall toxicity and low bioaccumulation potential of drilling fluids, the effects of drilling discharges are highly localised and are not expected to manifest through the food web.

It is expected that any potential minor behavioural impacts from planned discharges would be temporary and localised given the transient nature of marine fauna within the operational area. Therefore, the severity level (consequence) is assessed as Slight (1).

5.6.2.7. Cultural Heritage Values and Sensitivities

Impacts to water quality, sediment quality, changes to habitats and injury/morality of marine fauna from discharges has the potential to result in physical and tangible changes to the cultural heritage value of oceans waterways.

As summarised above, change in sediment quality, change in water quality, and change in habitats is expected to be localised to the Operational Area, with no long-term consequences. The severity level (consequence) is assessed as Slight (1).

5.6.3. Cumulative Impacts

The Judith-2 Operational Area is on the western edge of the Gippsland Basin 'Area To Be Avoided' surrounding the Woodside-operated Gippsland Basin Joint Venture producing & non-producing assets. The planned short duration geophysical and geotechnical surveys, as detailed in this EP, are not considered to add to cumulative impacts to the greater Gippsland Basin, nor are any concurrent survey operations known presently. Specific to the drilling activity, the planned jack-up MODU to be used, would move to Emperor Energy following the completion of the ongoing campaign being conducted by Woodside on their Gippsland Basin assets.

The closest offshore wind farm feasibility license (Navigator North) is approximately 35 km away from the Operational Area. This development was placed on hold by the operator in September 2025 with no survey or construction activities expected in the foreseeable future.

No barriers to migration or movement of species were identified from activities conducted under this EP. Therefore, no cumulative impacts were identified.

5.6.4. ALARP Demonstration

Impacts from planned discharges – drill cuttings and fluids are relatively well understood, supported by scientific literature and in situ observations. However, inherent variability in individual animal responses introduces a degree of uncertainty when predicting specific reactions. Planned discharges – drill cuttings and fluids is considered a standard operation, given drilling activities in the Bass Strait are well practiced. The resulting potential impacts have no conflicts with company values, no partner interests, and no significant stakeholder interests.

Based on these factors, Emperor Energy has assigned potential impacts from planned discharges – drill cuttings and fluids as an ALARP Decision Context: Type A.

5.6.5. Adopted Control Measures

To sufficiently define good practice the consideration of additional control measures has been assessed as part of defining the adopted control measures to support the Type A decision.

Table 5-12 lists the adopted control measures to ensure potential impacts from planned discharges – drill cuttings and fluids are reduced to ALARP.

Table 5-12: Adopted Control Measures: Planned Discharges – Drill Cuttings and Fluids

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
CM08: Planned Maintenance System (All activities)	Equipment used to treat planned discharges shall be maintained in accordance with manufacturer's specification as detailed within the PMS.
CM05: AGR Chemical Assessment Procedure (Geotechnical survey and drilling)	Chemicals that will be or have the potential to be discharged to the marine environment will meet the chemical acceptance criteria as the AGR Chemical Assessment Process. Chemicals used as a component of a planned drilling discharge will meet the drilling chemical acceptance criteria, including: • Components of water-based mud (WBM);

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
	• Stock barite; • Cementing products; and • Hydraulic control fluids.
CM38: Use of WBM during drilling (Geotechnical survey and drilling)	Barite (as a WBM constituent) concentrations will be at or below: • Mercury (Hg) – 1 mg/kg (1 ppm) dry weight in stock barite. • Cadmium (Cd) – 3 mg/kg (3 ppm) dry weight in stock barite.
CM06: Residual materials management (Drilling only)	Dry bulk inventories will be maintained to as low as technically required to complete the operations. Following the completion of drilling, plug and abandonment of the well, excess dry bulk cement, barite and bentonite shall be treated in the following order: 1. Pumped downhole as a slurry 2. Transferred to the next operator 3. Returned to shore for treatment/ disposal.

Table 5-13 lists the additional control measures and considers each against the principle of gross disproportionality between the sacrifice (cost, time, effort) of implementation and the reduction in risk or impact and environmental benefit.

Table 5-13: Consideration of Additional Control Measures

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
Riserless Mud Recovery (RMR) for treatment of cuttings onboard MODU prior to discharge	An RMR will prevent discharge of drilling fluids and cuttings generated during drilling without a riser directly to the seabed. However, implementing the RMR system significantly increases project complexity and cost without providing substantial environmental benefits. The system requires additional seabed equipment (expanding the temporary footprint), demands more specialist personnel (straining limited MODU bed space), and becomes a critical path item, adding 1–2 days of rig time (thereby increasing MODU rental costs estimated at $2 to 4 million) plus over $1 million in rental and operational costs. Given the limited impact from seabed discharge of water-based fluids and cuttings, the financial and logistical risks outweigh the minimal environmental gain.	No
Onshore treatment and disposal	Onshore treatment and disposal of drill cuttings and fluids introduce significant logistical challenges and costs that outweigh the minimal environmental benefit. Key concerns include: Elevated HSE Risk: Transferring bulk material from the rig to vessels and then to shore introduces a new, complex task requiring non-standard offshore equipment, increasing the	No

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
	number of lifts and transfers, and posing a significant risk to personnel. High Onshore Disposal Cost: The operation would consume limited onshore disposal capacity and incur substantial disposal fees for materials that are safe (PLONOR) in the marine environment. Given the limited impact from discharge of WBM and cuttings, the financial, safety and logistical risks outweigh the minimal environmental gain.	
Exclusion of barite from drilling materials	The primary function of barite in drilling fluids is to increase the mud density (weight) to control downhole pressure and prevent dangerous blowouts. Barite itself is an extremely inert, insoluble mineral. It is classified as PLONOR (Pose Little Or NO Risk) to the marine environment. The minimal environmental concern comes from trace heavy metals (like cadmium, lead, or mercury) that may be present as impurities in commercial barite deposits. However, the bioavailability (the amount that dissolves and becomes harmful to marine life) of these trace metals is very low in the natural marine environment. Many substitutes do not perform as well as barite in terms of density, mud flow stability, or suspension properties, which can lead to extended drilling durations or well control issues. Barite is essential for safely managing high-pressure formations to prevent the risk of a catastrophic well blowout, which poses a massive risk to personnel safety, the rig, and the environment. This single factor often overrides any minor environmental gain. As a result, the safety risks outweigh the minimal environmental gain.	No
Cuttings reinjection into formation	Implementing cuttings reinjection into a formation with high uncertainty for suitability for injection introduces significant safety and financial costs. CRI fundamentally requires a dedicated, non-reservoir well for effective injection. The massive, fixed cost of drilling this dedicated disposal well poses a substantial financial burden that is difficult to justify when compared to the minimal environmental benefit gained over discharge of treated cuttings overboard. This excessive upfront investment, coupled with the high risk of well failure or poor injectivity, makes CRI grossly disproportionate to the minimal environmental gain.	No
Slim well design	A slim hole well design cannot be implemented because it would compromise the ability to achieve the drilling and evaluation objectives safely. The current well plan already represents the optimal minimum hole size necessary to	No

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
	reach the target zones and meet all safety and data collection requirements.	
Water quality and/or sediment monitoring	The environmental impact from planned discharges of drill cuttings and fluids is expected to result in a slight change to the environment given the absence of sensitive marine habitats in the Operational Area and surrounds. The Operational Area is located in open ocean high-energy environment which inherently encourages maximum dilution and dispersion of the discharges. Given these factors the marginal environmental benefit gained from water quality and/or sediment monitoring is minimal because the risk of significant environmental impact is already negligible.	No

5.6.6. Acceptability Determination

Potential impacts from planned discharges – drill cuttings and fluids are considered acceptable based on meeting the acceptability criteria as defined in Section 2.7. Table 5-14 details the evaluation of the potential impacts against each acceptability criterion.

Table 5-14: Acceptability determination

ACCEPTABILITY CRITERIA	DETERMINATION
To meet the principles of ESD	Planned discharges – drill cuttings and fluids were assessed to have a potential residual severity of Slight (1) which is not considered as having the potential to result in serious or irreversible environmental damage. Consequently, no further evaluation against the principles of ESD is required.
Internal context	The proposed management of the impact is aligned with the Emperor Energy HSE Policy (APPENDIX A). Activities will be undertaken in accordance with the Implementation Strategy (Section 8).
External context	There have been no stakeholder objections or claims regarding planned discharges – drill cuttings and fluids.
Other requirements	Planned discharges – drill cuttings and fluids will be managed in accordance with legislative requirements. Those related to this aspect include: • Minamata Convention • IFC EHS Guidelines – Offshore Oil and Gas Development (2015) • Recovery Plan for Marine Turtles in Australia (CoA, 2017a). • Recovery Plan for the White Shark (Carcharodon carcharias) (CoA, 2013). • Recovery Plan for the Australian Sea Lion (DSEWPaC, 2013). • National Recovery Plan for Albatrosses and Petrels 2022 (CoA, 2022).

ACCEPTABILITY CRITERIA	DETERMINATION
	• Wildlife Conservation Plan for Seabirds (CoA, 2020c). • Conservation Management Plan for the Blue Whale (CoA, 2015a). • National Recovery Plan for the Southern Right Whale (DCCEEW, 2024). • Conservation Advice for Fin Whales (TSSC, 2015b) • Conservation Advice for Sei Whales (TSSC, 2015c). Relevant legislative requirements that provide explicit actions against this aspect are detailed below. Relevant conservation advice or management plans that identify discharges as a threat but do not provide explicit requirements are not detailed below. Emperor Energy considers the adopted control measures as detailed in Section 5.6.5 will manage the potential impacts from this aspect to ALARP and acceptable levels.

Requirement	Demonstration
IFC EHS Guidelines – Offshore Oil and Gas Development Set stock barite limits of 1 mg/kg and 3 mg/kg for mercury and cadmium, respectively.	CM 13: Use of WBM during drilling, details limitation on mercury and cadmium concentrations for stock barite in accordance with these guidelines.
Minamata Convention The Minamata Convention covers all aspects of the life cycle of mercury, controlling and reducing mercury across a range of products, processes, and industries. Australia ratified the Minamata Convention on 7 December 2021 and is bound by international law to put controls in place to manage emissions, releases and disposal of mercury and mercury compounds.	CM 13: Use of WBM during drilling, details limitation on mercury and cadmium concentrations for stock barite in accordance with IFC guidelines, which represents good international industry practice.

Acceptability outcome	Potential impacts from planned overboard discharges – drill cuttings and fluids are considered Acceptable having met all the acceptability criteria as detailed above. Implementing the adopted control measures listed in Section 5.6.5 will ensure the following EPO will be met: EPO2: Impacts from planned overboard discharges are limited to: • Localised* and temporary changes in water and sediment quality, • Localised* and temporary behavioural changes to marine fauna and

ACCEPTABILITY CRITERIA	DETERMINATION
	• Localised* change in benthic habitats and communities. *Localised is defined as within 500 m of the discharge location. By meeting the above EPOs, it will ensure potential impacts will be at or below the defined acceptable levels.

5.7. Impulsive Underwater Noise Emissions

5.7.1. Aspect Source

The activity will generate impulsive underwater noise emissions from:

- Geophysical surveys (up to 4 days):
  - MBES
  - SSS
  - SBP
  - 2D shallow seismic survey (2D survey)
  - USBL
- MODU Positioning (~2 days)
  - USBL
- VSP (up to 6 hours)

See Sections 3.4.1, 3.5.1 and 3.6.5 for further details on each of these activities.

5.7.1.1. Geophysical Surveys

Geophysical surveys using MBES, SSS, SBP techniques require the use of impulsive sound sources that are high-energy and of a high frequency. Most commercial SBPs are compact, low-power systems that generate high-resolution, shallow-penetrating acoustic pulses across a range of frequencies. In contrast, MBES and SSS operate at very high frequencies and provide high-resolution imaging using short, micro-duration sound pulses (Jiménez-Arranz et al., 2017).

The maximum duration for all geophysical surveys is 4 days and the expected sound source levels for MBES, SSS, SBP techniques are detailed in Table 5-15.

Table 5-15: Sound source levels and frequencies for MBES, SSS, SBP geophysical survey techniques

SOURCE	SOUND SOURCE LEVELS (SOUND PRESSURE LEVEL - SPL)	FREQUENCY	REFERENCE
MBES	SPL: 210–247 dB re 1 µPa @ 1 m	>200 kHz	Seiche 2020
SSS	SPL: 200–234 dB re 1 µPa @ 1 m	>110 kHz	Seiche 2020

SOURCE	SOUND SOURCE LEVELS (SOUND PRESSURE LEVEL - SPL)	FREQUENCY	REFERENCE
SBP	SPL: 161–230 dB re 1 µPa @ 1m	2-16 kHz	Seiche 2020

The very high-frequency, micro-pulse signals generated by the MBES and SSS result in minimal horizontal noise propagation beyond their narrow, directional beams, with acoustic energy rapidly attenuating outside those beams (MacGillivray et al., 2013; Zykov, 2013). Because these systems operate at high frequencies (Table 5-15), most of their sound output lies above the hearing range of most marine fauna species.

Similarly, previous studies of SBPs demonstrate that their sound energy also propagates only limited distances horizontally outside the primary beam (MacGillivray et al., 2013; Zykov, 2013; McPherson and Wood, 2017). Noise-modelling undertaken by Wood and McPherson (2019) for the Beach Energy geophysical and geotechnical seabed survey is considered an appropriate analogue for this activity due to comparable survey methods, similar seabed lithology (cemented calcarenite caprock with coarse carbonate sand), and the similar water depths (≥72 m water depth modelled by Wood and McPherson (2019) compared to ~76 m water depth at indicative Judith-2 well location). The Wood and McPherson (2019) analogue noise modelling study predicted the distances at which noise-effect criteria for plankton, fish, turtles and marine mammals may be exceeded.

These studies found that noise-effect thresholds for plankton, fish, turtles and marine mammals may be exceeded only within approximately 10 m of the sound source during MBES, SSS, SBP geophysical survey operations. In contrast, thresholds for invertebrates, lobsters and squid were not exceeded (Wood and McPherson, 2019). Therefore, potential impacts from MBES, SSS, SBP geophysical surveys are expected to be limited to plankton, fish, turtles and marine mammals occurring within 10 m of the sound source. The Wood and McPherson (2019) study was based on marine mammal injury thresholds current at the time of publication. New, more conservative thresholds for auditory injury (which includes PTS) and TTS have recently been published (NMFS, 2024) (refer to Section 5.7.1.6). Given the low noise emissions expected for MBES, SSS, SBP geophysical surveys; and the very short distances reached by the previous injury thresholds (PTS and TTS), moderate increases in these distances due to the more conservative thresholds is very unlikely to indicate unacceptable impacts to noise-sensitive receptors in or near the Survey Area.

By comparison, Lui et al. (2025) predicted that a single source of continuous noise equivalent to survey vessel-generated noise (Section 5.8.1.5) may reach effect criteria within 2.24 km (refer to predictions for Scenario 2 in Section 5.8.1.6). Given this large difference in scale, underwater noise from MBES, SSS, SBP geophysical surveys is expected to be largely indistinguishable from vessel noise at lower frequencies. Furthermore, due to the small spatial extent of acoustic emissions from MBES, SSS, SBP geophysical surveys, cumulative noise impacts are not anticipated.

The USBL survey technique emits sound beams to the underwater environment. USBL produces lower levels of sound emissions compared to MBES, SSS, SBP geophysical surveys described above. As a result, impulsive underwater noise generated by USBL is also expected to be indistinguishable from lower frequency noise generated by the survey vessel. As such, USBL has not been assessed further and cumulative impacts are not expected.

Consequently, noise produced by MBES, SSS, SBP and USBL geophysical surveys will be assessed as part of vessel and MODU operations of the activity (Section 5.8).

5.7.1.2. 2D Survey

The 2D survey will consist of an impulsive sound source and receiver to identify shallow gas. Equipment will consist of a single sound source using compressed air to create a pulse of acoustic energy with a volume of up to 160 in^3. The duration of the 2D survey is within the total maximum duration for all geophysical surveys of 4 days.

Based on the lack of appropriate analogue studies for 2D geophysical surveys, Emperor commissioned JASCO to undertake a modelling study of underwater noise levels associated with the proposed 2D survey (Lui et al. 2025). For further details on the study refer to Section 5.7.1.5.

JASCO's Airgun Array Source Model (AASM) was used to predict the sound source levels for the 2D survey, with the sound source modelled over the AASM's full frequency range, up to 25 kHz (Lui et al. 2025). Modelling of the 2D survey sound source (Lui et al. 2025) predicts the peak source pressure level of 230 dB re 1 µPa m. Further details on predicted the distances noise-effect thresholds for marine fauna are provided in Section 5.7.1.6.

5.7.1.3. MODU Positioning

A USBL transponder may be lowered to the seabed during MODU positioning operations. The USBL and all associated equipment will be recovered at the end of activities. The USBL frame will typically cover an area of <2 m^2. As mentioned above, impulsive underwater noise generated by USBL is also expected to be indistinguishable from lower frequency noise generated by the support vessel operations during MODU positioning. As such, USBL has not been assessed further and cumulative impacts are not expected.

Consequently, noise produced by USBL during MODU positioning will be assessed as part of vessel and MODU operations of the activity (Section 5.8).

5.7.1.4. VSP

VSP is a standard drilling activity used to image subsurface structures and reservoir characteristics around the well. It involves deploying an acoustic source from the MODU or support vessel and recording signals using receivers placed at various depths in the well. For this project, VSP will run for up to 6 hours using an acoustic source of up to 4 × 150 in^3.

JASCO's Airgun Array Source Model (AASM) was used to predict the sound source levels for the VSP operations, with the sound source modelled over the AASM's full frequency range, up to 25 kHz (Lui et al. 2025). Modelling of the VSP sound source (Lui et al. 2025) predicts the peak source pressure level of 241 dB re 1 µPa m. Further details on predicted the distances noise-effect thresholds for marine fauna are provided in Section 5.7.1.6.

5.7.1.5. Noise Modelling

To determine the spatial extent for impact evaluation, Emperor Energy commissioned JASCO to undertake a modelling study of underwater noise levels associated with 2D survey and VSP activities (Lui et al. 2025; APPENDIX F).

Based on a review of the geophysical and VSP equipment to be used (Section 3.4.1, 3.5.1 and 3.6.5), it was identified that the 2D survey and VSP techniques were most relevant to the assessment of potential impacts to receptors, due to the greater range in operating frequencies and higher source sound levels (Lui et al. 2025). Impulsive sound emissions produced from the other geophysical survey activities are expected to

have sound contours within those produced for 2D survey and VSP techniques, and therefore have not been evaluated further.

The selected equipment and associated sound source levels used in the modelling are representative for those that will be used in the activity. The equipment specifications are expected to be analogous to those considered by Lui et al. (2025) whose modelling accounted for a range of sound source types.

Table 5-16 details the impulsive noise emission scenarios modelled for this activity.

Table 5-16: Description of scenarios, site location and water depth for impulsive noise modelling scenarios (Lui et al. 2025)

SCENARIO	DESCRIPTION	SOUND SOURCES	LATITUDE (°S)	LONGITUDE (°E)	DEPTH (M)
1	VSP operations – with a total of 5, 10, 25, 50, 100, 150, 200, 250, and 300 impulses were considered independently to inform the assessment of different operational configurations.	VSP - with a source volume of 600 in^3 over a 24-hour period.	38°08'30.87''	148°32'21.8''	66.7
2	Geophysical Survey - 2D Survey with a total of 495 discharges impulses.	Single 160 in^3 seismic source over a 24-hour period.	38°08'30.87''	148°32'21.8''	66.7

5.7.1.6. Thresholds and Results

To assess whether an impact may occur modelled received sound levels were compared to receptor noise effect criteria associated with behavioural change, Temporary Threshold Shift (TTS), Permanent Threshold Shift (PTS), auditory injury (AUD INJ), mortality or potential mortal injury for sound sensitive receptors (Table 5-17).

Underwater noise can disrupt marine fauna, leading to behavioural changes, displacement from critical habitats, or interference with biologically important sounds such as vocalisations and echolocation. In some cases, exposure to underwater noise may cause physical harm, including:

- Recoverable injury – physical effects from noise exposure that the animal can recover from.
- Mortality or potential mortal injuries – severe physical damage to hearing or other organs that may result in death or a high likelihood of mortality.
- Temporary Threshold Shift (TTS) – a short-term reduction in hearing sensitivity following noise exposure, with full recovery over time.
- Auditory Injury (AUD INJ) – damage to the auditory system caused by intense noise, which can include *Permanent Threshold Shift (PTS)*.
- PTS – an irreversible loss of hearing sensitivity after prolonged or high-level noise exposure.

The criteria defined in Table 5-16 align with NOPSEMA's Environment Bulletin on underwater sound impact evaluation (NOPSEMA 2026) and were selected as they reflect the best available science, with the exception of marine turtle criteria. Published scientific research and papers for criteria used are detailed within the

relevant receptor section. In the absence of noise criteria specific to low intensity 2D survey and VSP techniques, criteria applied for high intensity seismic surveys have been used.

Accomando et al. (2025) has suggested updates to the underwater sound exposure thresholds for marine turtles within the 2024 Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase 4). The noise modelling study commissioned for this activity (Liu et al. 2025) does not use these thresholds as they were not available at the time of modelling. In the absence of predictions against Accomando et al. (2025) exposure thresholds for marine turtles, Emperor have chosen to use the PTS and TTS thresholds for low frequency cetaceans (Section 5.7.1.6) as a proxy for potential PTS and TTS for marine turtles. This is considered a highly conservative and precautionary approach, given:

- The PTS and TTS thresholds for low frequency cetaceans are numerically lower than the PTS and TTS thresholds criteria for marine turtles (refer to Table 5 11 and Table 5 12):
  - PTS turtles 220dB, PTS LF cetaceans 199dB
  - TTS turtles 200dB, TTS LF cetaceans 179dB
- The weighting function applied is based on the more sensitive broader hearing frequency range of low frequency cetaceans. Generalised hearing ranges are:
  - LF cetacean 7 Hz to 35 kHz
  - Marine turtles below 2 kHz (NOAA, 2024a).

This application of low-frequency cetacean threshold criteria, due to the lower thresholds values and wider frequency weighting range, effectively provides a highly conservative and protective framework for marine turtles in the absence of using Accomando et al. (2025).

Table 5-17: Impulsive PTS, TTS and Behaviour sound effect criteria used and the maximum distance to noise effect criteria for 2D survey and VSP (Lui et al. 2025)

RECEPTOR	NOISE EFFECT CRITERIA	MAXIMUM RMAX DISTANCE (KM)		REFERENCE
		2D SURVEY	VSP	
Invertebrates: effect at the seafloor	209 dB PK-PK	-	0.64	Day et al. 2016
	210 dB PK-PK	-	0.51	
	212 dB PK-PK	-	0.01	
Invertebrates: no effect at the seafloor	202 dB PK-PK	0.03	0.18	Payne et al. 2007
Fishes: (no swim bladder): mortality/potential mortal injury	>213 dB PK or	-	0.02	Popper et al. 2014
	>219 dB SEL_{24h}	-	-	
Fishes: (no swim bladder): recoverable injury	>213 dB PK or	-	0.02	Popper et al. 2014
	>216 dB SEL_{24h}	-	-	
Fishes – including fish eggs, and larvae: (swim bladder not involved in hearing): mortality/ potential mortal injury	>207 dB PK or	-	0.41	Popper et al. 2014
	>210 dB SEL_{24h}	-	0.02	
Fishes– including fish eggs, and larvae: (swim bladder not involved in hearing): recoverable injury	>207 dB PK or	-	0.41	Popper et al. 2014
	>203 dB SEL_{24h}	-	0.06	
Fishes: (swim bladder involved in hearing): mortality/ potential mortal injury	>207 dB PK or	-	0.41	
	>207 dB SEL_{24h}	-	0.03	
Fishes: (swim bladder involved in hearing): recoverable injury	>207 dB PK or	-	0.41	Popper et al. 2014
	>203 dB SEL_{24h}		0.06	
		-		

RECEPTOR	NOISE EFFECT CRITERIA	MAXIMUM RMAX DISTANCE (KM)		REFERENCE
		2D SURVEY	VSP	
Fishes: (swim bladder or no swim bladder): TTS	>186 dB SEL_{24h}	0.10	1.07	Popper et al. 2014
Turtle: behavioural response	166 dB SPL	0.70	1.74	McCauley et al. 2000
Turtle: behavioural disturbance	175 dB SPL	0.17	0.54	McCauley et al. 2000
Turtle: PTS	>232 dB PK or 204 dB SEL_{24h}	- -	- 0.05	Finneran et al. 2017
Turtle: TTS	>226 dB PK or 189 dB SEL_{24h}	- -	- 0.53	Finneran et al. 2017
Marine mammals: behavioural	160 dB SPL	1.48	2.82	NOAA 2024
Low-frequency cetaceans: AUD INJ (humpback and pygmy blue whales)	222 dB PK 183 dB SEL_{24h}	- 0.02	- 0.85	NMFS 2024
Low-frequency cetaceans: TTS (humpback and pygmy blue whales)	216 dB PK 168 dB SEL_{24h}	- 2.00	- 4.82	NMFS 2024
High-frequency cetaceans: AUD INJ (dolphins, beaked whales, sperm whales)	230 dB PK 193 dB SEL_{24h}	- -	- -	NMFS 2024
High-frequency cetaceans: TTS (dolphins, beaked whales, sperm whales)	224 dB PK 178 dB SEL_{24h}	- -	- 0.03	NMFS 2024
Very High-frequency cetaceans: AUD INJ (pygmy and dwarf sperm whales)	202 dB PK 159 dB SEL_{24h}	0.03 -	0.07 -	NMFS 2024

RECEPTOR	NOISE EFFECT CRITERIA	MAXIMUM RMAX DISTANCE (KM)		REFERENCE
		2D SURVEY	VSP	
Very High-frequency cetaceans: TTS	196 dB PK	0.05	0.28	NMFS 2024
(pygmy and dwarf sperm whales)	144 dB SEL_{24h}	-	0.16	
Otariid pinnipeds: AUD INJ	230 dB PK	-	-	NMFS 2024
(seals)	185 dB SEL_{24h}	-	-	
Otariid pinnipeds: TTS	224 dB PK	-	-	NMFS 2024
(seal)	170 dB SEL_{24h}	-	0.05	

Peak sound pressure level: dB re 1 µPa; SEL24h dB re 1µPa2·s.

5.7.2. Impact Evaluation

Potential impacts of impulsive underwater noise emissions to receptors are:

- Behavioural changes to marine fauna
- Auditory Impairment to marine fauna, including:
  - Recoverable injury
  - Mortality / potential mortal injury
  - Temporary threshold shift (TTS)
  - Permanent Threshold Shift (PTS).

Underwater impulsive noise emissions may impact the following biological receptors:

- Marine invertebrates
- Fishes
- Marine reptiles
- Marine mammals.

5.7.2.1. Marine Invertebrates

Comprehensive reviews of seismic noise impacts to invertebrates have been undertaken by Carroll et al. (2017) and Edmonds et al. (2016). Literature reviews suggests particle motion, rather than sound pressure, is a more important factor for crustacean and bivalve hearing. There are currently no defined noise effect criteria for invertebrates and hence the results from the Day et al. (2016) study on acoustic impacts from seismic exposure on southern rock lobsters (*Jasus edwardsii*) are typically used. The study found that sub-lethal effects, relating to impairment of reflexes, damage to the statocysts and reduction in numbers of haemocytes (possibly indicative of decreased immune response function), were observed after exposure to measured received sound levels of peak-peak pressure: 209–212 dB re 1 µPa.

Payne et al (2007) found no effects to the American lobster (*Homarus americanus*) in righting time or haemolymph biochemistry but a possible reduction in calcium after exposure to received noise levels of 202 dB re 1 µPa (PK-PK). Thus, the Payne et al (2007) level is applied as a no effect criteria.

Noise modelling (Lui et al. 2025: APPENDIX F : Table 5-17) predicted invertebrate noise criteria for effect or no effect at the seafloor to be reached. Review of the maximum distances to noise effect criteria for invertebrates identified underwater noise generated from VSP reaches these criteria at a greater range in comparison to 2D survey maximum distances. The maximum distances to invertebrate noise criteria for impulsive underwater sound emissions expected for the activities are:

- Invertebrate effect at the seafloor criteria were reached within 64 m of the VSP sound source. These effect criteria were not reached for the 2D survey.
- Invertebrate no effect at the seafloor criterion was reached with 180 m of the VSP sound source and 30 m of the 2D survey sound source.

As such, both effect and no effect criteria for invertebrates may occur, however, the effect will be limited to within the operational area, in proximity to the sound source.

McCauley et al. (2000) assessed the effects of air gun noise on caged squid (*Sepioteuthis australis*). No sub-lethal injury or mortality because of exposures in this study was observed. Several squid showed alarm responses to the start-up of an airgun by firing their ink sacs and/or jetting away from the source, but this was not observed for similar or greater levels if the signal was ramped up. General habituation was observed with a decrease in alarm responses with subsequent exposures. During the trial the squid showed avoidance to the airgun by keeping close to the water surface at the end of the cage furthest from the airgun (within the sound shadow). As such, avoidance of invertebrates may occur during VSP and the 2D surveys, however, the maximum area affected is anticipated to be limited to <180 m, and therefore impacts are not expected to be significant.

Based on noise modelling, only sublethal effects to invertebrates are expected within 180 m of an impulsive sound source during the activity. Invertebrates within this range may include commercially valued invertebrate species such as squid, octopus, rock lobster and giant crab species. However, no stakeholder objections or claims were raised. Impacts to commercially valued marine invertebrates are expected to be limited to behavioural effects such as altered swimming patterns and expected to have no effect on behaviour and distribution at a population level given the localised (within 180 m of an impulsive sound source) and short-term (4 days) scale of impulsive sound source use during the activity. Impact severity level was assessed as Slight (1).

5.7.2.2. Fishes

Noise effect criteria for fishes are based on the presence of a swim bladder. Typically, site-attached and demersal fish have a swim bladder, whereas pelagic fish do not. As noise effect criteria for sharks does not currently exist, they are assessed as fishes without swim bladders. Qualitative and quantitative noise effect criteria used in this assessment for fishes are from the American National Standards Institute (ANSI) accredited report of sound exposure guidelines for fishes and sea turtles (Popper et al. 2014).

Behavioural Effects

There is limited research on how free-ranging fish react to seismic sound sources (Carroll et al. 2017). One study by Wardle et al. (2001) found that free-ranging marine fish inhabiting an inshore reef exposed to seismic source sounds (195-218 dB re 1 µPa) exhibited a startle response but did not avoid the area. Behavioural response studies on caged fish exposed to seismic sound sources observed startle and alarm responses (Carroll et al. 2017; Fewtrell and McCauley 2012).

Popper et al. (2014) suggests fishes are highly likely to exhibit a behavioural response to impulsive sound within hundreds of metres from the sound source. As a result, behavioural responses (startle and avoidance) to fishes are expected to be limited to within the Operational Area during VSP operations or geophysical surveys.

The Operational Area does not overlap areas where site-attached EPBC Act listed fish species are likely to be present or contains habitats that encourage aggregations of these fishes (Sections 4.5.1 and 4.6.3). Potential behavioural response effects to fishes are expected to be limited to transiting fish individuals, including the following EPBC Act listed threatened species with the potential to be present in the Operational Area:

- Blue Warehou (CD)
- Eastern Gemfish (CD)
- Harrison's Dogfish (CD)
- Little Gulper Shark (CD)

- Orange Roughy (CD)
- School Shark (eastern) (CD)
- Whale Shark (V)
- White Shark (V)

The behaviours of fishes–if present within hundreds of metres of the impulsive sound source–may be affected by impulsive underwater noise emissions. Studies of behavioural effects of fishes from exposure to irregularly pulsed sound (Chapuis et al. 2019; Hawkins et al 2014; Slotte et al. 2004; Deleau et al. 2019) infers that fishes may exhibit the following behaviours when exposed to impulsive sound:

- No significant different in behaviour
- Less inquisitive behaviours
- Dispersion of fish schools
- Change in swimming depth (swimming to deeper waters)
- No significant change in horizontal distribution
- Behavioural avoidance (increased swimming speed, movements away from the source).

These behavioural effects to fishes–potentially within the Operational Area–are expected to be intermittent and of a short-term duration given the duration of geophysical surveys (4 days) and VSP operations (6 hours). Based on the spatial extent of potential behavioural effects, the impact is also considered highly localised (hundreds of metres of the impulsive sound source).

Given the localised intermittent and short-duration of geophysical surveys (4 days) and VSP operations (6 hours), the limited spatial area (within hundreds of metres from the impulsive sound source) where behavioural responses to fishes are expected, and the absence of habitats encouraging aggregations or site-attached fishes, potential behavioural effects to fishes is unlikely to result in population level effects. Impact severity level was assessed as Slight (1).

Injury and Mortality

Popper et al. (2014) defined quantitative effect criteria for three types of immediate effects to fishes from impulsive sound exposure:

- Mortality, including injury leading to death.
- Recoverable injury, including injuries unlikely to result in mortality, such as hair cell damage and minor haematoma.
- TTS.

Table 5-17 details the noise effect criteria from Popper et al. (2014) and the distances at which modelling estimated they could be reached for fishes with and without a swim bladder. In summary:

- Mortality/potential mortal injury noise effect criteria is predicted within a maximum distance of 410 m for fish with a swim bladder, and 20 m for fish without a swim bladder from the VSP sound source. These noise effect criteria were not reached for the 2D survey.
- Recoverable injury noise effect criteria is predicted within a maximum distance of 410 m for fish with a swim bladder, and 20 m for fish without a swim bladder from the VSP sound source. These noise effect criteria were not reached for the 2D survey.

- TTS noise effect criterion for fish with or without a swim bladder was predicted within at a maximum distance of 1.07 km from the VSP sound source and 0.10 km from the 2D survey sound source.

As such, the potential for auditory injury to fish will be limited to within the operational area, in proximity to the sound source. Studies to date have not shown mortality in relation to potential impact to fish from impulsive noise, though prolonged or extreme exposure to high-intensity, low-frequency sound, may lead to physical damage such as threshold shifts in hearing or barotraumatic ruptures (Carroll et al. 2017). Based on timeframes of geophysical surveys (4 days) and VSP (6 hours) for the activity, impulsive underwater sound generated during the activities is not expected result in prolonged exposure to fish.

The Operational Area does not overlap any areas where site-attached EPBC Act listed fish species are likely to be present or contains habitats that encourage aggregations of these fish (Sections 4.5.1 and 4.6.3). Potential impacts to fish are expected to be limited to transiting fish individuals, including the following EPBC Act listed threatened species with the potential to be present in the Operational Area as listed in Table 4-5.

Given the intermittent and short-duration of geophysical surveys (4 days) and VSP operations (6 hours), the limited spatial area (approximately 1 km of an impulsive sound source) of exposure to impulsive sound above fish noise effect criteria, and the absence of habitats encouraging aggregations or site-attached fish, potential impacts to fish is unlikely to result in population level effects. Impact severity level was assessed as Slight (1).

5.7.2.3. Marine Turtles

Behavioural Effects

McCauley et al. (2000) noise effect criteria for behavioural response to turtles from impulsive sound was used in this assessment. Table 5-17 details the noise effect criteria from MacCauley et al. (2000) and the distances at which modelling estimated they could be reached. For VSP and the 2D survey the behavioural response noise effect criteria were predicted at maximum distances of 1.74 km and 700 m from the impulsive sound sources, respectively. As a result, behavioural responses to marine turtles are expected to be limited to within the Operational Area during VSP operations or geophysical surveys.

Three marine turtle species may occur within the Operational Area. No BIAs or habitat critical to the survival of the species occur within the Operational Area (see Section 4.6.5). The potential for behavioural response effects on marine turtles from impulsive sound generated during the activity is expected to be limited to transiting individuals.

The behaviours of individual transiting marine turtles–if present within 1.74 km of active VSP operations and 700 m of the active 2D survey sound source–may be affected by impulsive underwater noise emissions. Evidence of the behavioural effects of marine turtles when exposed to impulsive sound sources have been studied in detail. Studies of marine turtle behavioural effects from exposure to airgun operations (DeRuiter and Doukara 2012; Papale et al. 2020) marine turtles to exhibit the following behaviours when exposed to impulsive sound:

- Interrupted basking behaviour and diving response
- Increased swimming speed and erratic behaviour.

These behavioural effects to transiting individual marine turtles–potentially within the Operational Area–are expected to be intermittent and of a short-term duration given the duration of geophysical surveys (4 days) and VSP operations (6 hours). Based on the spatial extent of potential behavioural effects, the impact is also considered highly localised (within 1.74 km from the impulsive sound source). Review of the Recovery Plan

for Marine Turtles in Australia (CoA 2017) found these potential behavioural effects to transiting individual marine turtles outside of marine turtle BIAs is considered not inconsistent with the plan.

Given the intermittent and short-duration of geophysical surveys (4 days) and VSP operations (6 hours), the limited spatial area (within 1.74 km from the impulsive sound source) where behavioural response to marine turtles are expected, and the absence of BIAs or habitat critical to the survival of the species within the Operational Area, potential behavioural effects to marine turtles is unlikely to result in population level effects. Impact severity level was assessed as Slight (1).

Injury (TTS and PTS)

Based on the strategy of using low-frequency cetacean threshold criteria to define the spatial extent of potential injury to marine turtles (Section 5.7.1.6), the distances at which modelling estimated AUD INJ and TTS criteria are reached are detailed in Table 5-17 and summarised as follows:

- VSP operations: AUD INJ and TTS SEL_{24h} thresholds were predicted at maximum distances of 850 m and 4.82 km from the sound source, respectively.
- 2D survey: AUD INJ and TTS SEL_{24h} thresholds were predicted at maximum distances of 20 m and 2 km from the sound source, respectively.
- AUD INJ and TTS PK noise effect criteria for both VSP operations and the 2D survey were not reached.

The adopted noise effect criteria for injury to turtles from impulsive sound exposure is a SEL_{24h} cumulative metric that requires a turtle to be consistently exposed at this noise effect criteria for a 24-hour period for injury to occur. For injury to occur, marine turtles require to remain within 4.82 km of the MODU during VSP operation for at least a 24-hour period. Given that marine turtles (if present) are expected to be transiting through the Operational Area and the duration of VSP operations is limited to up to 6 hours, the risk of injury to marine turtles is not credible.

For the 2D survey, a marine turtle would need to remain within 2 km of the moving survey vessel for at least 24 hours for an injury to occur. Therefore, the 2D survey is the only activity during which a potential risk of turtle injury could arise. Although three marine turtle species may occur within 2 km of the vessel, no BIAs or habitat critical to their survival are present in this area (see Section 4.6.5). As a result, this area does not contain habitats that encourages high-site fidelity for marine turtles and transiting individual marine turtles may transit through. Consequently, the area does not contain habitat that would promote high site fidelity, and any turtles present are expected to be transiting individuals.

Given the intermittent and short duration of the 2D survey (four days), the very limited spatial extent where injury could occur (within 2 km of the vessel), and the expectation that turtles will transit through the area rather than remain for extended periods, the potential for injury to marine turtles during the 2D survey is considered not credible and is not assessed further.

5.7.2.4. Marine Mammals

Behavioural Effects

The United States National Marine Fisheries Service (NOAA 2024) acoustic threshold for behavioural effects in marine mammals was used to define the spatial extent of potential behavioural effects to marine mammals. Acoustic modelling predicted behavioural effects in marine mammals at a maximum range of 2.82 km from a VSP sound source, and 1.48 km from a 2D survey sound source (Table 5-17). As a result, behavioural effects to marine mammals are expected to be limited to within the Operational Area during VSP operations or geophysical surveys.

The following marine mammal species listed as threatened or migratory under the EPBC Act have the potential to be present in the Operational Area:

- Blue whale, southern right whale (endangered, migratory)
- Fin whale, sei whale (vulnerable, migratory)
- Antarctic minke whale, Bryde's whale, dugong, dusky dolphin, humpback whale, killer whale, pygmy right whale, sperm whale (migratory).

The Operational Area also overlaps a 'foraging' BIA for the pygmy blue whale (<0.01%), and the 'migration' BIA for the southern right whale (<0.001%). Other marine mammals that may undertake biologically important behaviours (foraging, feeding or related behaviour likely in the likely to occur) in the Operational Area include the fin whale, pygmy right whale, and the sei whale.

The behaviours of these marine mammal species–if present within 2.82 km of active VSP operations and 1.48 km of the active 2D survey sound source–may be affected by impulsive underwater noise emissions. Evidence of the behavioural effects in marine mammals when exposed to impulsive sound sources have been studied in detail and found effects/responses are highly variable depending on initial behavioural state and environmental conditions (Erbe et al. 2025). A comprehensive review of literature (Durbach et al. 2021; Kvadsheim et al. 2017; Goldbogen et al. 2013; Erbe et al. 2025; di Iorio and Clark 2010; Castellote et al. 2012; Southall et al. 2023; Matthew and Parks 2021; Dunlop et al. 2017; Dunlop et al. 2018) found marine mammal behavioural effects from exposure to impulsive sound include:

- Change in movement patterns (increase swimming speed away from the impulsive source)
- Change in dive/respiratory parameters (quickly approaching the surface)
- Change in rates of breaching
- Cessation of deep feeding, or foraging and abandoned foraging dives
- Change to vocalisations, modified song characteristics ceasing/reducing/decreased call rates.

These behavioural effects to the marine mammal species–potentially within the Operational Area–are expected to be intermittent and of a short-term given the duration of geophysical surveys (4 days) and VSP operations (6 hours). Based on the spatial extent of potential behavioural effects, the impact is also considered highly localised (within 2.82 km from the impulsive sound source). Review of relevant conservation management plans and recovery plans for the above listed marine mammal species found the potential of behavioural effects from impulsive underwater noise emissions may be inconsistent with:

- Conservation Management Plan for the Blue Whale (CoA 2015a)

  Anthropogenic noise in BIAs will be managed such that any blue whale continues to utilise the area … and is not displaced from a foraging area.,

- National Recovery Plan for the Southern Right Whale (DCCEEW 2024), and DAWE (2021) definitions.

  Anthropogenic noise in BIAs will be managed such that risk of behavioural disturbance is minimised and it does not prevent any southern right whale from utilising the area …

To ensure the activity is not inconsistent with the above plans, Emperor's whale management procedure (Section 8.4.5) will be implemented applying pre-activity surveys for observation zones based on maximum distances to marine mammal behavioural effects threshold to ensure the absence of whales within the area of potential behavioural effects prior to VSP and geophysical survey activities. By ensuring no whales are within the range of potential impact to marine mammals, impulsive underwater noise emissions from the

activity will not displace pygmy blue whales from the foraging BIA, will not prevent migrating southern right whales from utilising the migration BIA and will not interrupt whales undertaking biologically important behaviours. Given the intermittent and short-duration of geophysical surveys (4 days) and VSP operations (6 hours), and the limited spatial area (within 2.82 km from the impulsive sound source) where behavioural response to marine mammals may occur, the risk of behavioural effects to marine mammals is unlikely to result in population level effects. The impact severity levels for potential behavioural effects to marine mammals was assessed as Minor (2) based on:

- Localised and temporary impacts to migrating southern right whales, possibly foraging blue whales and marine mammals that may undertake biologically important behaviours (blue whale, fin whale, pygmy right whale, and the sei whale) in the Operational Area.
- Implementing the control measures detailed in Section 5.7.5, adapted using maximum distances to marine mammal behavioural effects threshold, can reduce the risk of displacement of possibly foraging blue whales during VSP operations and the 2D survey. Distances to the marine mammal behavioural effects threshold (2.82 km for the VSP operations, and 1.48 km for the 2D survey (Table 5-17)) have been used to define operating distances, observation distances and pre-activity/activity survey zones for the control measures detailed in Section 5.7.50. The control measures detailed in Section 5.7.5 ensures the activity is in accordance with the Guidance on Key Terms within the Conservation Management Plan for the Blue Whale (DAWE 2021a) that details mitigation measures must be implemented to reduce the risk of displacement occurring during the activity where modelling indicates that behavioural disturbance within a Foraging Area may occur.
- The fin and sei whale's conservation advice (TSSC 2015b; TSSC 2015c) has a consequence rating for anthropogenic noise and acoustic disturbance as minor with the extent over which the threat may operate as moderate-large.
- The Recovery Plan for the Southern Right Whale (DCCEEW, 2024c) identifies acute industrial noise, of which geophysical surveys and VSP would be classed, as a threat that is classified as a minor consequence which is defined as individuals are affected but no affect at a population level. Distances to the marine mammal behavioural effects threshold (2.82 km for the VSP operations, and 1.48 km for the 2D survey (Table 5-17)) have been used to define operating distances, observation distances and pre-activity/activity survey zones for the control measures detailed in Section 5.7.5. Therefore, these control measures can be implemented to reduce the risk of behavioural disturbance to migrating southern right whales.

Injury (TTS and AUD INJ)

The US National Marine Fisheries Service (NMFS 2024) reviewed available literature to determine exposure criterion for the onset of temporary hearing TTS and AUD INJ for marine mammals based on their frequency hearing range. NMFS (2024) details that after sound exposure ceases or between successive sound exposures, the potential for recovery from hearing loss exists, with AUD INJ resulting in incomplete recovery and TTS resulting in complete recovery.

National Marine Fisheries Service (NMFS 2024) has provided updated thresholds for the onset of AUD INJ and TTS. These criteria as details in Table 5-17 are based on dual acoustic injury criteria for impulsive sounds that included peak pressure level thresholds and SEL_{24h} thresholds, where the subscripted 24h refers to the accumulation period for calculating SEL. The peak sound pressure level (PK) criterion is not frequency weighted whereas the SEL_{24h} is frequency weighted according to the marine mammal species hearing group. The following sections provide an evaluation on potential injury based on each marine mammal species hearing group.

LOW-FREQUENCY CETACEANS

Table 5-17 details the low-frequency cetacean noise effect criteria for AUD INJ and TTS and the distances at which modelling estimated these criteria are reached. In summary:

- VSP operations: AUD INJ and TTS SEL_{24h} thresholds were predicted at maximum distances of 850 m and 4.82 km from the sound source, respectively.
- 2D survey: AUD INJ and TTS SEL_{24h} thresholds were predicted at maximum distances of 20 m and 2 km from the sound source, respectively.
- AUD INJ and TTS PK noise effect criteria for both VSP operations and the 2D survey were not reached.

Modelling results have predicted only the impulsive sound TTS and AUD INJ SEL_{24h} thresholds for low-frequency cetaceans to be reached. TTS and AUD INJ SEL_{24h} thresholds is a cumulative metric that requires a receptor to be consistently exposed at this noise effect criteria for a 24-hour period for injury to occur. As a result, the potential of injury (TTS and AUD INJ) to low-frequency cetaceans during the activity requires a low-frequency cetacean to be consistently exposed to VSP operations or the 2D survey for a 24-hour period for injury to occur. VSP operations is limited to up to 6 hours, therefore the risk of injury to low-frequency cetaceans during VSP operations is not credible and not considered further. For the 2D survey, low-frequency cetaceans require to remain within 2 km of the moving survey vessel for at least a 24-hour period for injury to occur. As a result, the only event where potential risk of injury to low-frequency cetaceans can occur is during the 2D survey.

The following low-frequency cetaceans listed as threatened or migratory under the EPBC Act have the potential to be present in within 2 km of the moving survey vessel in the Operational Area:

- Blue whale, southern right whale (endangered, migratory)
- Fin whale, sei whale (vulnerable, migratory)
- Antarctic minke whale, Bryde's whale, humpback whale, pygmy right whale (migratory).

The Operational Area also overlaps 'possible foraging area' BIA for the pygmy blue whale, and the migration BIA for the southern right whale. Other marine mammals that may undertake biologically important behaviours (foraging, feeding or related behaviour likely in the likely to occur) in the Operational Area include the fin whale, pygmy right whale, and the sei whale.

The Operational Area does not contain habitats that encourages high-site fidelity for low-frequency cetaceans given the area does not overlap reproduction, known foraging area, foraging annual high use area BIAs for low-frequency cetaceans. Low-frequency cetaceans in the Operational Area are not expected to remain for extended periods and are expected to transit through. Given the intermittent and short-duration of the 2D survey (4 days), the limited spatial area (within 2 km from the moving survey vessel) where injury may occur, and that low-frequency cetaceans in the Operational Area are expected to transit through and not remain in the area for extended periods, potential injury to low-frequency cetaceans during the 2D survey is not considered credible and not considered further.

HIGH AND VERY HIGH-FREQUENCY CETACEANS

Table 5-17 details the high and very high-frequency cetacean noise effect criteria for AUD INJ and TTS and the distances at which modelling estimated these criteria are reached. In summary:

- High-frequency cetaceans: TTS SEL_{24h} threshold for VSP operations was the only impulsive noise effect criteria reached, which was predicted within a maximum distance of 30 m from the sound source.
- Very high-frequency cetaceans: TTS SEL_{24h} threshold for VSP operations was the only SEL_{24h} threshold reached, which was predicted within a maximum distance of 190 m from the sound source. The TTS and

AUD INJ PK noise effect criteria for VSP operations were predicted at maximum distances of 280 m and 70 m from the sound source, respectively. The TTS and AUD INJ PK noise effect criteria for the 2D survey were predicted at maximum distances of 50 m and 30 m from the sound source, respectively.

The maximum distances to high and very high-frequency cetacean noise effect criteria for AUD INJ and TTS are within the Operational Area. As a result, the following high and very high-frequency cetacean species listed as migratory under the EPBC Act have the potential to be present in the Operational Area:

- Dusky dolphin, killer whale, sperm whale (migratory).

These high and very high-frequency cetaceans may occur in the Operational Area, but no BIAs of biologically important behaviours were identified. High and very high-frequency cetaceans (if present) are expected to be transiting through the Operational Area.

It is considered highly unlikely that high and very high-frequency cetaceans would experience the onset of TTS and AUD INJ from impulsive sound, given the intermittent and short-duration of geophysical surveys (4 days) and VSP operations (6 hours), the limited spatial area (within 280 m from the impulsive sound source) where injury may occur, and the absence of BIAs in the Operational Area. If impulsive sound exposure was to occur, impacts would be limited to individuals and therefore unlikely to result in population level effects. The impact severity levels for potential injury (AUD INJ and TTS) to high and very high-frequency cetaceans was assessed as Slight (1).

PINNIPEDS

Table 5-17 details the otariid pinnipeds noise effect criteria for AUD INJ and TTS and the distances at which modelling estimated these criteria are reached. For otariid pinnipeds, the only AUD INJ and TTS noise effect criteria reached was TTS SEL_{24h} threshold during VSP operations, which was predicted at a maximum of 50 m from the sound source.

The long-nosed fur-seal and the Australian fur-seal may occur in the Operational Area but no BIAs or haul out areas were identified. Modelling results have predicted only the impulsive sound TTS SEL_{24h} thresholds for otariid pinnipeds to be reached during VSP operations. SEL_{24h} thresholds is a cumulative metric that requires a receptor to be consistently exposed at this noise effect criteria for a 24-hour period for injury to occur. As a result, the potential of injury (TTS and AUD INJ) to otariid pinnipeds during the activity requires an otariid pinnipeds to be consistently exposed to VSP operations for a 24-hour period for injury to occur. VSP operations is limited to up to 6 hours, therefore the risk of injury to otariid pinnipeds during VSP operations is not credible and not considered further.

5.7.2.5. First Nations Cultural Heritage Values and Sensitivities

The intrinsic link between First Nations people and culturally significant species are understood to be based on First Nations obligations to care for the species (Weir, 2012). The management of culturally significant species is considered to be applied to the species at a population level. As a result, impacts to culturally significant species at a population level has the potential to disrupt the intrinsic link of First Nations people ability to care for culturally significant species.

FISHES

Culturally significant food sources such as fish are located within and migrate through the south-east marine region. Fish were one of the main food resources in coastal areas and cultural heritage listed fish traps can still be found in this region. Many coastal First Nations groups, including the Gunaikurnai and Bunurong people used coastal areas for marine resources and continue to engage in cultural and spiritual significant

coastal practices which include subsistence fishing and collecting of other coastal resources in this area (Gunaikurnai Land and Waters Aboriginal Corporation, 2015; Biosis, 2024; NOO, 2002b).

Potential Disruption to Cultural Heritage Values and Sensitivities

Fish are an important resource for First Nations people identified during a review of relevant First Nations group Country Plans and NOO (2002b). First Nations people have a responsibility to care for fish and their habitats to ensure resources can be continued for future generations (NOO, 2002b). Disruptions to species and habitats have the potential to affect the success of populations, which can affect the cultural practices associated with coastal resource fishing and collection.

As discussed in Section 5.7.2.2, potential impacts are assessed as Slight (1) for fish which is unlikely to have a significant impact on individuals at a population level and are not expected to impact the value of culturally significant species. As such, the intrinsic link between environmental receptors and First Nations people's cultural heritage values and sensitivities is expected to be maintained.

CETACEANS

First Nations people around Australia have long had a strong connection to whales and dolphins, which has significance as totemic ancestors to some groups. Cetaceans in Sea Country hold deep cultural significance to First Nations groups of the South-East marine region and feature in Dreaming stories, ceremony, song and dance traditions (NOO, 2002b).

Cetaceans are culturally significant species for the First Nations peoples as identified during a review of relevant First Nations group Country Plans and NOO (2002b). First Nations people have a cultural responsibility to ensure cetaceans that reside within and migrate through Sea Country are cared for and healthy and their habitat is sustained. Whales feature in Dreaming stories, ceremony, song and dance of some First Nations groups along the coasts of Australia. The protection of whale species is paramount to First Nations groups of the South-East marine regions spiritual, physical wellbeing and it is the responsibility of First Nations people to care for Sea Country and protect the species for present and future generations. Whales are also a food resource, and First Nations people still collect parts of beached whales, as has been done for thousands of years (NOO, 2002b).

As discussed in Section 5.7.2.4, EPBC threatened and migratory cetaceans may be present within the personification area.

Potential Disruption to Cultural Heritage Values and Sensitivities

First Nations people may have kinship and/or a responsibility to care for culturally significant species and their habitats. Impacts to species at a population level may inhibit First Nations people's ability to perform cultural obligations to care for culturally significant species and their habitats. If responsibilities have not been met it could result in a sense of powerlessness to members of First Nation groups responsible for the protection and care of these species (Holcombe, 2022).

As discussed in Section 5.7.2.4, impacts for high and very high frequency whales is assessed as Slight (1) for which is unlikely to have a significant impact on individuals at a population level. Potential impacts to low frequency whales is not considered credible and are not expected to impact the value of culturally significant species. As such, the intrinsic link between environmental receptors and First Nations people's cultural heritage values and sensitivities is expected to be maintained.

PINNIPEDS

Pinnipeds such as seals and sealions are culturally significant species for the First Nations peoples as identified during a review of relevant First Nations group Country Plans and NOO (2002b). The First Nations people of the south-east marine region have a profound relationship with Sea Country and seals feature in cultural practices and Dreaming stories and have been hunted as a valuable food resource. Seals feature in song and dance of the First Nations people and are also a food resource (NOO, 2002b).

Seals and sealions are culturally significant species and of value to First Nations peoples of the south-east marine region. Two species of pinniped may occur within the Operational Area: the New Zealand fur-seal and the Australian fur-seal. No BIAs or habitat critical to the survival of the species were identified for pinnipeds (Section 4.6.3.3).

Potential Disruption to Cultural Heritage Values and Sensitivities

First Nations people may have kinship and/or a responsibility to care for culturally significant species and their habitats. Impacts to species at a population level may inhibit First Nations people's ability to perform cultural obligations to care for culturally significant species and their habitats. If responsibilities have not been met it could result in a sense of powerlessness to members of First Nation groups responsible for the protection and care of these species (Holcombe, 2022).

As discussed in Section 5.7.2.4, potential impacts pinnipeds is not considered credible and are not expected to impact the value of culturally significant species. As such, the intrinsic link between environmental receptors and First Nations people's cultural heritage values and sensitivities is expected to be maintained.

It is to be noted that through a review of Country Plans, publicly available information, and consultation that turtles have not been identified as a culturally significant species for the First Nations people of this region.

5.7.3. Cumulative Impacts

The Judith-2 operational area is on the western edge of the Gippsland Basin 'Area To Be Avoided' surrounding the Woodside-operated Gippsland Basin Joint Venture producing & non-producing assets. The planned short duration geophysical and geotechnical surveys, as detailed in this EP, are not considered to add to cumulative impacts to the greater Gippsland Basin, nor are any concurrent survey operations known presently. Specific to the drilling activity, the planned jack-up MODU to be used, would move to Emperor Energy following the completion of the ongoing campaign being conducted by Esso Australia on their Gippsland Basin assets.

The closest offshore wind farm feasibility license (Navigator North) is approximately 35 km away from the Operational Area. This development was placed on hold by the operator in September 2025 with no survey or construction activities expected in the foreseeable future.

No barriers to migration or movement of species were identified from activities conducted under this EP. Therefore, no cumulative impacts were identified.

5.7.4. ALARP Demonstration

Impacts from impulsive underwater noise emissions are relatively well understood, supported by the existing and growing body of scientific literature and in situ observations. However, inherent variability in individual animal responses introduces a degree of uncertainty when predicting specific reactions. To reduce uncertainty, noise modelling was conducted for the Judith-2 activities to define the potential spatial extent of impact.

For blue whales and southern right whales there is some uncertainty with regards to the threat of underwater noise emissions as recognised in the CMP for blue whales and the National Recovery Plan for Southern right whales. As a precautionary approach for this uncertainty, these plans recommend additional mitigation measures and adaptive management strategies for specific activities and times of year.

Impulsive underwater noise emissions are considered a standard operation, given geophysical survey activities in the Bass Strait are well practiced. The resulting potential impacts have no conflicts with company values, no partner interests, and no significant media interests.

Based on these factors, Emperor Energy has assigned potential impacts from impulsive underwater noise emissions as an ALARP Decision Context: Type A for all receptors apart from blue whales and southern right whales.

For blue whales and southern right whales, Emperor Energy has assigned potential impacts from impulsive underwater noise emissions as an ALARP Decision Context: Type B. The Type B decision was based on recognising the greater uncertainty with regards to the potential impacts to blue whales and southern right whales and additional control measures that are required to ensure project activities are aligned with the objectives and relevant actions defined in the CMP for blue whales and the National Recovery Plan for Southern right whales to ensure potential impacts are ALARP.

5.7.5. Adopted Control Measures

To sufficiently define good practice the consideration of additional control measures has been assessed as part of defining the adopted control measures to support the Type B decision for blue whales and southern right whales and the Type A decision for other receptors.

Table 5-18 lists the adopted control measures to ensure impacts associated with impulsive underwater noise are reduced to ALARP.

Table 5-18: Adopted Control Measures: Impulsive Underwater Sound Emissions

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
CM13: Whale Management Procedure (All activities)	The Whale Management Procedure (see Section 8.4.5) details the controls to prevent possible displacement impacts to foraging pygmy blue whale and migrating southern right whales. Prior to an activity commencing, a pre-activity survey will be undertaken for activity-specific survey zones. The survey zones for impulsive sound generating activities include: • VSP: 3 km from the MODU • 2D survey: 1.5 km from the MODU The survey zones are based on the distance to the behaviour effect criteria, as detailed in Table 5-17, and have been rounded up to take into account accuracy of estimation of distance at sea. A conservative approach will be adopted whereby it is assumed that all whales present in the survey zones are conducting biologically important behaviours (e.g. foraging blue whales, migrating southern right whales). Visual surveys will be undertaken for 30 minutes prior to the activity commencing. If a whale is sighted within the survey zones the activity will not commence until:

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
	• No whales are observed for 30 minutes within the survey zone; or • Whales are observed leaving the survey zone. The period of 30 minutes is deemed as sufficient time to observe deep diving whales such as blue whales and southern right whales based on blue whale foraging behaviour and dive duration and southern right whale migration behaviours (Section 4.6.4.1). Once the activity has commenced, whales entering these zones after the start of the activity are not considered displaced, as their foraging or migrating behaviour is deemed uninterrupted—they have continued these behaviours despite the presence of operational noise from the activity. This is supported by observations during Beach Energy's drilling activities in the Otway Basin, presented in Section 4.6.4.1, which implies that there is no displacement of blue whales within 3,000 m of the MODU. This approach aligns with the Conservation Management Plan for the Blue Whale (CoA 2015a), the National Recovery Plan for the Southern Right Whale (DCCEEW 2024), and DAWE (2021) definitions. Activities can commence at night or in low visibility conditions (i.e., when observations cannot be undertaken) if no more than three whales have been seen in the survey zone in the preceding daylight hours and there was a two-hour period of no sightings in the survey zone. The 'no more than three whales' criterion is acceptable for blue whales because it indicates the krill stock at the location has been diminished. More than three whales within the previous daylight hours may indicate a large krill supply and more whales could be expected. The daylight hours is justified because it is the longest possible continuous observation period (i.e., one full day of observations). Three southern right whales would be an indication that there is an increased likelihood of a southern right whale within the survey zone during the period that observations cannot be undertaken.
CM14: Marine Fauna Observer (All activities)	Marine fauna sighting coverage will be maintained during pre-activity surveys in accordance with Emperor's Whale Management Procedure (see Section 8.4.5). The MODU and vessels will have at least one appropriately trained crew member on active duty who has completed the MFO Program Induction and is capable of supporting marine fauna observations. For all relevant pre-activity surveys (see Table 8-3), each support or survey vessel will have one dedicated Lead MFO, sourced from a specialist MFO service provider or equivalent (such as RPS, EPI Group or Blue Planet Marine), who is experienced and competent in detecting and identifying large baleen whales—particularly blue whales and southern right whales.

Table 5-19 lists the additional control measures and considers each against the principle of gross disproportionality between the sacrifice (cost, time, effort) of implementation and the reduction in risk or impact and environmental benefit.

Table 5-19: Consideration of Additional Control Measures

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
Seasonal timing	The Operational Area overlaps pygmy blue whale distribution and foraging BIA, where possible foraging may occur, and southern right whale migration BIA. Pygmy blue whales are potentially within Operational Area from November through to June. Southern right whales may travel through the Operational Area to and from coastal aggregation and migration areas during May-June and September-November. It is safe to assume there is no period when there is not a whale undertaking a biologically important behaviour within the Operational Area. Implementation of CM13: Whale Management Procedure will prevent possible displacement impacts to foraging pygmy blue whales and behavioural effects to migrating southern right whales that maybe present in the activity survey zones which are based on modelled maximum distances to behavioural effects for low-frequency cetaceans. The implementation of seasonal timing controls does not afford any further benefit given there is no period when there is not a whale undertaking a biologically important behaviour within the Operational Area.	No
Implementation of the EPBC Act Policy 2.1 Soft start and shut-down zones for Geophysical Survey and VSP operations	Soft starts applied to geophysical surveys and VSP operations will slowly ramp up the impulsive source allowing fauna to move away from the source. The resultant effect of fauna moving away from the source is considered potential displacement/disruption of foraging blue whales or migrating southern right whales which is not consistent with the requirements of the Conservation Management Plan for the Blue Whale (CoA 2015a), and the National Recovery Plan for the Southern Right Whale (DCCEEW 2024). Implementation of pre-activity surveys prior to soft starts in accordance with the EPBC Act Policy 2.1 as detailed in CM13: Whale Management Procedure will prevent possible displacement impacts to foraging pygmy blue whales and behavioural effects to migrating southern right whales that maybe present in the activity survey zones which are based on modelled maximum distances to behavioural effects for low-frequency cetaceans. The implementation of soft starts after a pre-activity survey will be applied to geophysical surveys and VSP operations where technically possible. However, some equipment used for geophysical investigations differs to conventional (and	Adopt in part (CM13)

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
	higher impact) seismic surveys and can only be turned on or off. This includes MBES, SSS, SBP and USBL. Therefore, there is no ability with this equipment to gradually 'ramp up' the sound source and implement soft-starts procedures for these survey activities. Conducting a pre-activity survey will ensure foraging blue whales or migrating southern right whales are not within the behavioural effect range prior to starting VSP operations or the geophysical surveys. In addition, soft start procedures where technically possible, will prevent the activities from being inconsistent with the requirements of the Conservation Management Plan for the Blue Whale (CoA 2015a), and the National Recovery Plan for the Southern Right Whale (DCCEEW 2024). Shut-downs in accordance with the EPBC Act Policy 2.1 stop work procedure ensures the minimisation of potential injury to whales in the vicinity of geophysical survey and VSP operations. Implementation of shut-downs in accordance with the EPBC Act Policy 2.1 as detailed in CM13: Whale Management Procedure will prevent injury to whales sighted within the shut-down zone which are based on modelled maximum distances to TTS for low-frequency cetaceans. This will ensure the activities are not inconsistent with the requirements of the Conservation Management Plan for the Blue Whale (CoA 2015a), and the National Recovery Plan for the Southern Right Whale (DCCEEW 2024). Soft starts and shut-downs are standard industry practice and where technically possible (i.e. operation of seismic sources for geophysical surveys and VSP operations) and will be implemented under CM13: Whale Management Procedure.	
Passive acoustic monitoring (PAM)	PAM is most useful in the detection of odontocetes such as sperm whales, dolphins and porpoise known to emit regular distinctive clicks and high frequency calls during long dives. PAM has limited utility in detecting lower frequency calls of baleen whales (such as blue whales, southern right whales) especially when in the presence of constant background low frequency sound such as that generated by the vessel towing the PAM system. Given the very low utility and associated unreliability of using PAM to inform mitigation decision making, any additional cost is considered disproportionate to the benefit gained.	No
MFO during all geophysical activities and VSP operations	As described in Section 5.7.1.1, due to the small spatial extent of acoustic emissions from MBES, SSS, SBP and USBL geophysical surveys the impulsive underwater noise	Adopt in part (CM13 for 2D

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
	emissions are expected to be largely indistinguishable from vessel noise at lower frequencies. As a result, controls to prevent impacts to marine mammals will be managed by the implementation of CM12: EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans. The implementation of CM12 does not require the use of dedicated MFO during MBES, SSS, SBP and USBL geophysical surveys. However, 2D survey and VSP operations will produce impulsive underwater sound emissions that will extend further than the vessel restriction distances defined in EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans. MFO will therefore be used during 2D survey and VSP operations. The use of MFOs on the survey vessel and support vessels during the 2D survey and VSP operations will be implemented under CM13 Whale Management Procedure. However, the use of MFOs during MBES, SSS, SBP and USBL geophysical surveys will not be implemented as the cost is disproportionate to the marginal environmental benefit.	survey and VSP operations only)
Dedicated MFO on MODU	Industry experience from recent drilling and decommissioning campaigns in the Otway and Gippsland Basins has shown that MFOs positioned on a MODU are often ineffective due to restricted and elevated viewing platforms, which limit visibility of the surrounding waters. In contrast, dedicating MFOs to each support vessel has proven substantially more effective, as vessels have unobstructed, lower-level vantage points and can maintain continuous visual coverage. Applying these learnings, Emperor Energy considers that assigning a dedicated MFO to each support vessel provides a more reliable approach for monitoring marine fauna. This arrangement enables both pre-activity and ongoing observations to be undertaken in accordance with Section 8.4.5. The use of MFOs on the survey vessel and support vessels are standard industry practice will be implemented under CM13 Whale Management Procedure. However, an additional MFO on the MODU will not be implemented as the cost is disproportionate to the marginal environmental benefit.	No
Dedicated monitoring vessel	An additional dedicated vessel is not required as monitoring activities can be effectively conducted from the survey vessel and the MODU. Cost is disproportionate to marginal environmental benefit.	No

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
Aerial surveillance	Aerial surveillance from aircraft or drones is not required as monitoring activities can be effectively conducted from the survey vessel and the MODU. MFO observations are possible up to 7 km from a vessel bridge height of ~20 m. activity survey zones are within 3 km. Cost is disproportionate to marginal environmental benefit.	No
Satellite imagery	Satellite imagery is considered excessive and impractical to reduce the potential impacts from underwater noise when compared to the use of MFOs and pre-activity surveys. The acquisition cost of satellite imagery (to detect whales) is expensive to task and acquire, especially for broad ocean areas required during a survey. The window of opportunity is limited by the satellite's orbit and revisit time, which often does not align with the real-time, continuous monitoring that can be met using MFOs. The process of acquiring the image, downlinking the data, processing it for whale detection, and relaying the result to the vessel in real-time introduces significant, often unacceptable, time delays. As a result of these factors, the use of satellite imagery is considered grossly disproportionate to the environmental benefit gained.	No
Infrared cameras	Infrared cameras for use by MFOs to detect marine mammals at night is considered disproportionate the minimal environmental benefit gained. The cost and complexity of installing and integrating specialised, stabilised IR systems for a short-term drilling campaign is considered an unreasonable sacrifice relative to the benefit gained.	No
Autonomous underwater vehicles (AUVs)	AUVs used to detect marine mammals underwater is considered a disproportionate cost of time and effort for the minimal environmental benefit gained. The expense, logistical effort, and technical risk associated with deploying an AUV system for brief VSP and geophysical activities for a single well greatly outweighs the modest increase in detection reliability over the existing, cost-effective use of MFOs during VSP and shallow seismic survey activities.	No

5.7.6. Acceptability Determination

Potential impacts from impulsive underwater sound emissions are considered acceptable based on meeting the acceptability criteria as defined in Section 2.7.

Table 5-20 details the evaluation of the potential impacts against each acceptability criterion.

Table 5-20: Acceptability determination

ACCEPTABILITY CRITERIA	DETERMINATION
To meet the principles of ESD	Impulsive underwater sound emissions were assessed as having a Minor (2) impact severity level which is not considered as having the potential to result in serious or irreversible environmental damage. Consequently, no further evaluation against the principles of ESD is required. Further, quantitative modelling has been undertaken to remove some of the scientific uncertainty associated with this aspect. As such, the activity is consistent with the principles of ESD.
Internal context	The proposed management of the impact is aligned with the Emperor Energy HSE Policy (APPENDIX A). Activities will be undertaken in accordance with the Implementation Strategy (Section 8).
External context	There have been no stakeholder objections or claims regarding impulsive underwater sound emissions.
Other requirements	Impulsive underwater sound emissions will be managed in accordance with legislative requirements. Those related to this aspect include: • Recovery Plan for Marine Turtles in Australia (CoA, 2017a). • Conservation Management Plan for the Blue Whale (CoA, 2015a). • Recovery Plan for the Southern Right Whale (DCCEEW, 2024c). • Recovery Plan for the White Shark (CoA, 2013). • Conservation Advice for Fin Whales (TSSC, 2015b) • Conservation Advice for Sei Whales (TSSC, 2015c) • South-east Marine Parks Network Management Plan 2025 (DNP 2025) Relevant legislative requirements that provide explicit actions against this aspect are detailed below. Relevant conservation advice or management plans that identify discharges as a threat but do not provide explicit requirements are not detailed below. Emperor Energy considers the adopted control measures as detailed in Section 5.7.5 will manage the potential impacts from this aspect to ALARP and acceptable levels.

Requirement	Demonstration
Conservation Management Plan for the Blue Whale (CoA 2015) Assessing the effect of anthropogenic noise on blue whale behaviour. Anthropogenic noise in BIAs will be managed such that any blue whale continues to utilise the area without injury and is not displaced from a foraging area.	Section 5.7.2.4 assesses the effects of anthropogenic noise from the activity on blue whale behaviour. Section 5.7.2.4 demonstrates that the activity can be conducted in a manner that is consistent with the conservation management plan and will not result in injury or

ACCEPTABILITY CRITERIA	DETERMINATION	
		displacement of pygmy blue whales from a foraging BIA. Section 5.7.5 details the adopted controls to manage anthropogenic noise from Program Activities such that any blue whale continues to utilise the area without injury and is not displaced from a foraging area. Having met these requirements, Program Activities are considered to be not inconsistent with the Conservation Management Plan for the Blue Whale.
	National Recovery Plan for the Southern Right Whale (DCCEEW 2024) Anthropogenic noise in BIAs will be managed such that risk of behavioural disturbance is minimised and it does not prevent any southern right whale from utilising the area or cause auditory impairment (TTS and PTS). Ensure environmental assessments associated with underwater noise generating activities include consideration of national policy (e.g. EPBC Act Policy Statement 2.1) and guidelines related to managing anthropogenic underwater noise and implement appropriate mitigation measures to reduce risks to southern right whales to the lowest possible level. Quantify risks of anthropogenic underwater noise to southern right whales, including behavioural disturbance, changes to vocalisations, and physiological effects to whales.	Section 5.7.5 details the adopted controls to manage anthropogenic noise to: • Minimise the risk of behavioural disturbance and does not prevent any southern right whale from utilising the area or cause auditory impairment (TTS and auditory injury). • Consider national policy and guidelines to manage anthropogenic noise and reduce potential impacts to southern right whales to ALARP. Section 5.7.2.4 assesses the effects of anthropogenic noise on southern right whales and considers relevant national policy and guidelines. Section 5.7.2.4 assesses the effects of anthropogenic noise on southern right whales using underwater acoustic modelling (Lui et al. 2025; APPENDIX F). Having met these requirements, Program activities are considered to be not inconsistent with the National Recovery Plan for the Southern Right Whale.
	Conservation Advice for fin and sei whales (TSSC 2015, TSSC 2016)	Section 5.7.2.4 assesses the effects of anthropogenic noise on fin and sei whales using underwater acoustic

ACCEPTABILITY CRITERIA	DETERMINATION	
	An assessment of the impacts of increasing anthropogenic noise (including from seismic surveys). Ensure fin and sei whales ongoing recovery.	modelling (Lui et al. 2025; APPENDIX F). Section 5.7.5 details the adopted controls to manage anthropogenic noise to ensure fin and sei whales ongoing recovery. Having met these requirements, Program activities are considered to be not inconsistent with the Conservation Advice for fin and sei whales.
	Recovery Plan for Marine Turtles in Australia (CoA 2017) Management action A1.5: Manage anthropogenic activities to ensure marine turtles are not displaced from identified habitat critical to the survival. Management action A1.6: Manage anthropogenic activities in BIAs to ensure that biologically important behaviour can continue.	Section 5.7.2.3 details how underwater sound emissions generated by Program Activities are not predicted to impact on the recovery of marine turtles given no important marine turtle habitats are within the ranges to noise effect criteria. Having met these requirements, Program Activities are considered to be not inconsistent with the Recovery Plan for Marine Turtles in Australia.
	South-east Marine Parks Network Management Plan 2025 (DNP 2025) Offshore petroleum activities under the NOPSEMA EPBC Program do not require additional assessment or authorisation by the Director of National Parks because the endorsed program takes account of impacts and risks to marine park values in a manner that satisfies the Director. Further, where the proposed activity is within an Australian Marine Park or may impact the marine park values, the Director is consulted in the preparation of environmental plans under the OPGGS Act.	Section 7 provides evidence of consultation with the DNP in the preparation of this EP and the submission of this EP to NOPSEMA for acceptance as required under the OPGGS Act.
Acceptability outcome	Potential impacts from impulsive underwater sound emissions are considered **Acceptable** having met all the acceptability criteria as detailed above.	

ACCEPTABILITY CRITERIA	DETERMINATION
	Implementing the adopted control measures listed in Section 5.7.5 will ensure the following EPOs will be met: EPO11: Underwater noise emissions from Project Activities in BIAs will be managed such that: • Any blue whale continues to utilise BIAs without injury and is not displaced from a foraging area. • It does not prevent any southern right whale from utilising BIAs or habitat critical to the survival of a species or cause auditory impairment (TTS and Auditory Injury). Biologically important behaviours can continue whilst Project Activities are being undertaken. By meeting the above EPO, it will ensure potential impacts will be at or below the defined acceptable levels.

5.8. Continuous Underwater Sound Emissions

Continuous underwater sound generated by the activity will impact ambient sound levels in the Twofold Shelf bioregion.

Heavy vessel traffic, including tanker, cargo, support, and passenger vessels, pass through the Twofold Shelf bioregion based on the location of major ports. The south-eastern coast is one of Australia's busiest in terms of shipping activity and volumes. There is no main commercial shipping routes within the Operational Area, however there is high vessel activity along the NSW coastline (see Section 4.8.3.1). Heavy traffic along the main shipping fairways provides a significant and continuous contribution to the ambient sound levels in the Operational Area.

Oil and gas activities, and strong weather conditions in the Gippsland Basin temporarily contribute to the ambient sound levels in the Operational Area. The temporary generation of underwater sound from the activity will introduce and replicate existing oil and gas activities' contributions to ambient sound levels.

5.8.1. Aspect Source

The activity will generate continuous underwater sound emissions for the duration of the activity ~60 days (see Section 3.3) from:

- Drilling activities
- Vessel and MODU operations
- ROV operations (i.e. well cutting)
- Helicopter operations.

Continuous underwater noise can be propagated by drill-rock interface during drilling operations, ROV operations, helicopters during take-off and landing from the MODU, and vessel operations including propeller cavitation, thrusters, hydrodynamic flow around the hull, and operation of machinery and equipment (Salgado Kent et al. 2016).

Comparison of continuous underwater noise sources indicates that thrusters used for vessel dynamic positioning generate the highest contribution to continuous underwater sound (Erbe et al. 2013). Consequently, vessel and MODU operations, have been described and modelled in Lui et al. (2025; APPENDIX F) and used in the impact evaluation. Other activities contribute to continuous underwater noise at far lower levels and are briefly described in the following subsections; these sources have not been modelled, as they are considered low-level and generally indistinguishable from vessel and MODU operational noise.

5.8.1.1. Drilling Activities

Underwater noise generated during drilling activities is expected to be indistinguishable from MODU operational noise for the following reasons:

- Well construction: The MODU will produce a small amount of continuous underwater sound during well construction, transmitted directly via the drill bit. These emissions are indistinguishable from general MODU operational noise generated from onboard equipment vibrations (e.g., pumps, generators, and machinery).
- Well test: Most acoustic energy from flaring is reflected by the sea surface. While underwater sound levels can reach approximately 136 dB re 1 µPa at a depth of 1 m, the noise dissipates to ambient levels within a few metres (Woodside 2024). Consequently, flaring will not contribute any additive effects distinguishable from general MODU operational noise generated from onboard equipment vibrations.

5.8.1.2. Vessel and MODU Operations

Vessel and MODU operations will generate continuous underwater sound through the following sources:

- MODU operations: The MODU will emit sound from onboard machinery (pumps, generators) and, to a lesser extent, the drill bit. Section 5.8.1.5 details the comprehensive evaluation of potential spatial extent from MODU drilling operations.
- Vessel operations: support vessels will emit sound from propeller cavitation, thruster use, machinery operation, and hydrodynamic hull flow. Section 5.8.1.5 details the comprehensive evaluation of potential spatial extent from multiple support vessels supporting drilling operations during the activity.

5.8.1.3. ROV Operations

Underwater noise from ROV operations is largely indistinguishable from ambient vessel noise at lower frequencies. Modelling studies demonstrate that ROVs make no significant contribution to overall underwater noise, as acoustic emissions are dominated by the dynamic positioning (DP) noise of the vessel deploying the ROV (Pangerc et al. 2016; Connell et al. 2021).

5.8.1.4. Helicopter Operations

Helicopter movements introduce airborne noise primarily from blade rotation. Richardson et al. (1995) found that for a Bell 214 helicopter, sound was audible in air for approximately four minutes before passing overhead, but detectable underwater for only 38 seconds at 3 m depth and 11 seconds at 18 m depth along the same flight path. Helicopter transfers will be brief and infrequent (5 times per week).

Noise levels for helicopters commonly used in offshore operations, such as the Eurocopter Super Puma AS332, have been measured at a maximum of 90.6 dB at a separation distance of 150 m (Woodside 2014). Similar to flaring, only a small proportion of airborne sound transfers into the water column; any sound that does transmit is expected to attenuate to ambient levels within metres of the sea surface. As a result, helicopter noise is not expected to be distinguishable from general MODU operational.

5.8.1.5. Noise Modelling

To determine the spatial extent for impact evaluation, Emperor Energy commissioned JASCO to undertake a modelling study of underwater sound levels associated with activities identified to produce continuous sound emissions (e.g. drilling and support activities) (Lui et al. 2025; APPENDIX F).

The selected vessels and associated sound source levels are considered to be representative for those that will be used in the activity. The vessels for the activities will be selected as part of a tender process as planning progresses. Vessel specifications are expected to be analogous to those considered by Lui et al. (2025) whose modelling accounted for a range of tow and OSV vessels. Table 5-21 provides a summary of the sound sources used within the noise modelling of the continuous sound source identified for the activity (Lui et al. 2025; APPENDIX F). Sound modelling adopted an anchored MODU as a proxy for a jack-up MODU. This is considered appropriate because both unit types exhibit comparable acoustic characteristics during drilling operations. Table 5-21 also details how the modelled sound sources for MODU drilling, and support vessels under DP or in transit are equivalent to the sound sources for resupply vessels, and AHTS vessels undertaking MODU mobilisation / demobilisation and positioning activities.

For MODU mobilisation / demobilisation and positioning, using sound source levels from 24-hour MODU drilling combined with 8 hours of DP operations from a support vessel provides a conservative proxy for two continuous sound producing AHTS vessels undertaking MODU mobilisation / demobilisation and positioning activities. MODU mobilisation / demobilisation and positioning is expected to generate sound from a mix of low-level noise during vessel transit and intermittent higher-level noise when dynamic positioning is engaged.

By applying continuous, high-energy broadband sound sources—equivalent to those produced during sustained MODU drilling and 8 hours of continuous DP—to represent two AHTS vessels undertaking MODU mobilisation / demobilisation and positioning activities, the assessment captures the full range of intermittent sound levels that may occur. Although AHTS vessels may produce brief, high-intensity impulses, the continuous high sound levels generated by MODU operations (and the support vessel's 8 hours of DP) are anticipated to result in a higher overall sound exposure over time. Review of sound source values of vessels with active thrusters for manoeuvring (168.9 – 178.2 dB re 1µPa.m for large vessels similar in length to AHTS vessels) found the levels to be equivalent to the sound source level of MODU drilling (175.5 dB re 1µPa.m) as used for modelling in Liu et al. (2025) (Center for Marine Acoustics 2023; McPherson et al. 2021).

Consequently, Scenario 4 in Table 5-22 provides a conservative representation of MODU mobilisation / demobilisation and positioning activities. Table 5-22 details the relevant continuous sound emission scenarios modelled for this activity.

Table 5-21: Technical information of the source levels for the continuous sound sources (Lui et al. 2025)

SOUND SOURCE	DESCRIPTION	RELEVANT ACTIVITY	SOUND LEVEL	BROADBAND
Offshore Support Vessel (OSV)	Stationary under DP	Resupply vessel	181.2 dB re 1 μPa^2m^2	10 Hz to 25 kHz
	Slow transit	Support vessel	175.1 dB re 1 μPa^2m^2	
MODU	Drilling	MODU drilling / AHTS vessel	175.5 dB re 1 μPa^2m^2	10 Hz to 31 kHz

SOUND SOURCE	DESCRIPTION	RELEVANT ACTIVITY	SOUND LEVEL	BROADBAND
Anchor Handling Tug Supply Vessel (proxy for tow vessel)	Stationary under DP	AHTS vessel	194.1 dB re 1 μPa^2m^2	10 Hz to 25 kHz
	Slow transit	AHTS vessel	173.1 dB re 1 μPa^2m^2	
ROV	Wellhead cutting	P&A	161.4 dB re 1 μPa^2m^2	2.5 kHz to 20 kHz

Table 5-22: Description of relevant scenarios, site location and water depth for continuous noise modelling scenarios (Lui et al. 2025)

SCENARIO	DESCRIPTION	SOUND SOURCES	LATITUDE (°S)	LONGITUDE (°E)	DEPTH (M)
2	Drilling operations	MODU drilling	38°08'30.87''	148°32'21.8''	66.7
3	Drilling operations with a vessel on standby.	MODU drilling + 1 x OSV (slow transit)	38°08'30.87''	148°32'21.8''	66.7
			38°08'29.7131''	148°33'46.8094''	72.8
4	Drilling operations with a vessel undertaking resupply operations. Or Conservative scenario for MODU mobilisation / demobilisation and positioning	MODU drilling + 1 x OSV (under DP for 8 hours)	38°08'30.87''	148°32'21.8''	66.7
			38°08'30.7983''	148°32'24.6740''	66.9
5	Well plug, abandonment and removal (i.e. wellhead cutting)	1 x ROV (cutting operations)	38°08'29.7131''	148°33'46.8094''	72.8
			38°08'30.87''	148°32'21.8''	66.7

5.8.1.6. Thresholds and Results

To assess whether an impact may occur modelled received sound levels were compared to receptor noise effect criteria (Table 5-23). These criteria are based on published scientific research and papers as detailed in and within the relevant receptor section.

Table 5-23: Continuous PTS, TTS and Behaviour sound effect criteria used and the applicable results for representative single pulse sites and for accumulated SEL scenarios (Lui et al. 2025)

HEARING GROUP	NOISE EFFECT CRITERIA	MAXIMUM RMAX DISTANCE (KM)				REFERENCE
		SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	
Fishes: (swim bladder): recoverable injury	>170 dB SPL for 48 h	-	-	-	-	Popper et al. 2014
Fishes: (swim bladder): TTS	>158 dB SPL for 12 h	-	-	-	-	Popper et al. 2014
Turtle: PTS	220 dB re 1 $\mu Pa^2 \cdot s$	-	-	-	-	Finneran et al. 2017
Turtle: TTS	200 dB re 1 $\mu Pa^2 \cdot s$	-	-	-	-	Finneran et al. 2017
Marine mammals: behavioural	120 dB SPL	2.24	3.31	5.22	3.06	NOAA 2024
Low-frequency cetaceans: Auditory Injury (humpback and pygmy blue whales)	197 dB SEL24h	0.03	0.03	0.09	-	NMFS 2024
Low-frequency cetaceans: TTS (humpback and pygmy blue whales)	177 dB SEL_{24h}	0.53	0.63	1.07	0.05	NMFS 2024
High-frequency cetaceans: Auditory Injury	201 dB SEL_{24h}	-	-	-	-	NMFS 2024

HEARING GROUP	NOISE EFFECT CRITERIA	MAXIMUM RMAX DISTANCE (KM)				REFERENCE
		SCENARIO 2	SCENARIO 3	SCENARIO 4	SCENARIO 5	
(dolphins, beaked whales, sperm whales)						
High-frequency cetaceans: TTS (dolphins, beaked whales, sperm whales)	181 dB SEL_{24h}	0.08	0.08	0.16	0.03	NMFS 2024
Very High-frequency cetaceans: Auditory Injury (pygmy and dwarf sperm whales)	181 dB SEL_{24h}	0.06	0.01	0.13	0.03	NMFS 2024
Very High-frequency cetaceans: TTS (pygmy and dwarf sperm whales)	161 dB SEL_{24h}	0.99	0.99	1.06	0.31	NMFS 2018
Otariid seals: Auditory Injury	219 dB SEL_{24h}	-	-	-	-	NMFS 2018
Otariid seals: TTS	199 dB SEL_{24h}	0.08	0.08	0.16	0.04	NMFS 2018

5.8.2. Impact Evaluation

Generation of underwater sound emissions during the activity introduces the following potential impacts to environmental receptors:

Potential impacts of impulsive underwater sound emissions to receptors are:

- Behavioural changes to marine fauna
- Auditory Impairment to marine fauna including:
  - Recoverable injury
  - Temporary threshold shift (TTS)
  - Permanent threshold shift (PTS).

Underwater continuous sound emissions may impact the following biological receptors:

- Fishes
- Marine reptiles
- Marine mammals.

5.8.2.1. Fishes

Popper et al. (2014) details that there is no direct evidence of mortality or potential mortal injury to fishes from ship sound emissions. Popper et al., (2014) details that risks of mortality and potential mortal injury, and recoverable injury impacts to fishes with no swim bladder (sharks) or where the swim bladder is not involved in hearing is low and that TTS in hearing may be a moderate risk near (tens of metres) the vessel. For fishes with a swim bladder involved in hearing risks of mortality and potential mortal injury impacts is low. However, some evidence suggests that fishes sensitive to acoustic pressure show a recoverable loss in hearing sensitivity, or injury when exposed to high levels of sound and Popper et al. (2014) details SPL criteria for fishes with a swim bladder involved in hearing.

The modelling study did not predict the potential of recoverable injury or TTS to occur for fishes, given the onset of these sound effect criteria were not met for any scenario (Table 5-23; Lui et al. 2025: APPENDIX F). Behavioural impacts, such as avoidance / moving away from the vessel, are more likely. Currently, quantitative threshold criteria for behavioural responses of fishes from continuous sound do not exist (Popper et al. 2014). Fishes are highly likely to exhibit behavioural disturbances within tens of metres from continuous sound sources (Popper et al. 2014). Behavioural disturbances to fishes from underwater sound are therefore localised and limited to within the Operational Area.

Fishes in the Operational Area are likely to exhibit avoidance responses from continuous sounds generated and radiated by the activity (Carroll et al. 2017). Fishes that do not avoid underwater sound radiated by the activity are likely to exhibit changes to schooling patterns and distribution from continuous sound (McPherson et al. 2016).

There are no habitats or features within the Operational Area that would restrict fish and sharks from moving away from the vessel.

The Operational Area is within a distribution BIA for the white shark though no habitat critical to the survival of the species or behaviours were identified. The Recovery Plan for the White Shark (*Carcharodon carcharias*) (CoA, 2013) does not identify sound as a threat.

The extent of the area of impact is predicted to be within the Operational Area for the duration of vessel and MODU operations. The severity of impact to fishes is assessed as Slight (1) based on:

- The Recovery Plan for the White Shark (*Carcharodon carcharias*) (CoA, 2013) does not identify sound impacts as a threat.
- Avoidance behaviour may occur within the Operational Area, however, no habitats likely to support site-attached fish have been identified within the Operational Area.
- Temporary avoidance behaviour may occur within the Operational Area; however, recovery would occur once the activity has finished. Based on the small area of impact, and that displaced fish would still be able to be caught outside of the Operational Area, impacts to commercial fishing are not predicted.

5.8.2.2. Marine Turtles

Popper et al. (2014) details that there is no direct evidence of mortality or potential mortal injury to sea turtles from ship sound emissions. Popper et al. (2014) found that there was insufficient data available to propose a quantitative exposure guideline or criteria for marine turtles for continuous sound such as those generated by vessels and instead suggested general distances to assess potential impacts. Using semi-quantitative analysis, Popper et al. (2014) suggests that there is a low risk to marine turtles from shipping and continuous sound except for TTS near (10s of metres) to the sound source, and masking at near, intermediate (hundreds of metres) and far (thousands of metres) distances and behaviour at near and intermediate distances from the sound source. Based on this information avoidance behaviour may occur within the Operational Area.

Finneran et al. (2017) presented revised thresholds for turtle PTS and TTS for continuous sound. Table 5-23 details the criteria, however the modelling study did not predict the potential of TTS or PTS to occur, given the onset of these sound effect criteria were not met for any scenario (Lui et al. 2025; APPENDIX F). Marine turtles in the Operational Area are likely to exhibit avoidance responses from continuous sounds generated and radiated by the activity (Hazel et al. 2007, Nelms et al. 2016). Hazel et al. (2007) observed marine turtles to flee an approaching vessel travelling at speeds representative of those proposed in the Operational Area.

The Recovery Plan for Marine Turtles in Australia (CoA 2017a) identifies noise interference as a threat to turtles. It details that exposure to chronic (continuous) loud noise in the marine environment may lead to avoidance of important habitat. Given the Operational Area does not overlap important habitat for marine turtles, continuous sound is not considered a threat.

The extent of the area of impact is predicted to be within the Operational Area. The severity of impact to marine turtles is assessed as Slight (1) based on:

- The Recovery Plan for Marine Turtles in Australia (CoA 2017a) details that exposure to chronic (continuous) loud noise in the marine environment may lead to avoidance of important habitat, however, no habitats important to marine turtles are located within the Operational Area.
- Thresholds for the onset of TTS and PTS in turtles were not reached.
- Avoidance behaviour may occur within the Operational Area where no marine turtle important habits are located.
- Low numbers of marine turtles are predicted in the Operational Area and therefore impacts would be limited to a small number of individuals.

5.8.2.3. Marine Mammals

BEHAVIOURAL EFFECTS

Numerous studies on marine mammal behavioural responses to sound exposure have not resulted in consensus in the scientific community regarding the appropriate metric for assessing behavioural reactions. The NMFS (NOAA 2024) criterion of 120 dB re 1 µPa for non-impulsive sound sources such as vessels is used as the marine mammal behavioural criteria for this assessment as it represents a conservative criterion as Southall et al. (2019) reviewed extensive literature and studies in relation to marine mammal behavioural response to impulsive (seismic, pile driving) and non-impulsive (drilling, vessels) and found that most marine mammals exhibited varying responses between 140 and 180 dB re 1 µPa.

The NMFS (NOAA 2024) marine mammal behaviour criterion of 120 dB re 1 µPa was predicted to be reached within 5.22 km of a continuous sound source in the Operational Area. As a result, potential behavioural effects to marine mammals are expected to extend up to 5.22 km from the boundary of the Operational Area (continuous noise EMBA) during vessel operations, if marine mammals are within this area.

The following marine mammal species listed as threatened or migratory under the EPBC Act have the potential to be present in the continuous noise EMBA:

- Blue whale, southern right whale (endangered, migratory)
- Fin whale, sei whale (vulnerable, migratory)
- Antarctic minke whale, Bryde's whale, dugong, dusky dolphin, humpback whale, killer whale, pygmy right whale, sperm whale (migratory).

The continuous noise EMBA also overlaps a 'foraging' BIA for the pygmy blue whale (<0.01%), and the 'migration' BIA for the southern right whale (<0.001%). Other marine mammals that may undertake biologically important behaviours (foraging, feeding or related behaviour likely in the likely to occur) in the continuous noise EMBA include the fin whale, pygmy right whale, and the sei whale.

The behaviours of these marine mammal species–if present within continuous noise EMBA–may be affected by continuous underwater noise emissions. Evidence of the behavioural effects in marine mammals when exposed to continuous sound sources have been studied in detail and found effects/responses are highly variable depending on initial behavioural state and environmental conditions (Erbe et al. 2025). A comprehensive review of literature (Sprogis et al. 2020; Arranz et al. 2021; Castellote et al. 2012; Melcon et al. 2012; McKenna 2011; Parks et al. 2010; Rolland et al. 2012) and reported behaviours from MMO sightings during offshore Victorian drilling campaigns (Section 4.6.4.1) found marine mammal behavioural effects from exposure to continuous sound include:

- Short-term behavioural impacts include alterations of dive patterns, swim speeds, swim orientation, group cohesiveness, behavioural state and changes in acoustic behaviour
- Minor behavioural changes including foraging, milling and swimming, avoidance, no response, and attraction.

These behavioural effects to the marine mammal species–potentially within the continuous noise EMBA–are expected to be intermittent and of a short-term given the intermittent presence of vessels and drilling operations as part of the activity. Based on the spatial extent of the continuous noise EMBA, the impact is also considered highly localised (within 5.22 km of a continuous sound source). Review of relevant conservation management plans and recovery plans for the above listed marine mammal species found the potential of behavioural effects from continuous underwater noise emissions may be inconsistent with:

- Conservation Management Plan for the Blue Whale (CoA 2015a)

  Anthropogenic noise in BIAs will be managed such that any blue whale continues to utilise the area … and is not displaced from a foraging area.,

- National Recovery Plan for the Southern Right Whale (DCCEEW 2024), and DAWE (2021) definitions.

  Anthropogenic noise in BIAs will be managed such that risk of behavioural disturbance is minimised and it does not prevent any southern right whale from utilising the area.

To ensure the activity is not inconsistent with the above plans, Emperor's whale management procedure (Section 8.4.5) will be implemented applying pre-activity surveys for observation zones based on maximum distances to marine mammal behavioural effects threshold to ensure the absence of whales within the area of potential behavioural effects prior to drilling activities. By ensuring no whales are within the range of potential impact to marine mammals, continuous underwater noise emissions from the activity will not displace pygmy blue whales from the foraging BIA, will not prevent migrating southern right whales from utilising the migration BIA and will not interrupt whales undertaking biologically important behaviours.

Given the intermittent and short-duration of vessel operations, the risk of behavioural effects to marine mammals is unlikely to result in population level effects. The impact severity levels for potential behavioural effects to marine mammals was assessed as Minor (2) based on:

- Highly localised area of potential of behavioural change to marine mammals if present within continuous noise EMBA.
- Implementing the control measures detailed in Section 5.8.5 will ensure whales will not be present within relevant pre-activity/activity survey zones (adapted using the maximum distance to marine mammal behavioural effects threshold) prior to relevant activities commencing, which will prevent the risk of displacement of foraging blue whales within foraging BIAs during vessel operations. The distances to the marine mammal behavioural effects threshold (5.22 km) has been used to define operating distances, observation distances and pre-activity/activity survey zones for the control measures detailed in Section 5.8.5. The control measures detailed in Section 5.8.5 ensure the activity is in accordance with the Guidance on Key Terms within the Conservation Management Plan for the Blue Whale (DAWE 2021a) that details mitigation measures must be implemented to prevent the risk of displacement occurring during the activity where modelling indicates that behavioural disturbance within a Foraging Area may occur.
- The fin and sei whale's conservation advice (TSSC 2015b; TSSC 2015c) has a consequence rating for anthropogenic noise and acoustic disturbance as minor with the extent over which the threat may operate as moderate-large.
- The National Recovery Plan for the Southern Right Whale (DCCEEW 2024) identifies shipping and industrial noise as a threat that is classed as a minor consequence which is defined as individuals are affected and implementation of controls will ensure continuous noise does not prevent any southern right whale from utilising the area.

INJURY (TTS AND AUDITORY INJURY)

National Marine Fisheries Service (NMFS 2024) has provided updated thresholds for the onset of Auditory Injury and TTS. These criteria, as detailed in the 2024 Updated Technical Guidance (NMFS-OPR-71) are based on SEL_{24h} thresholds, where the subscripted 24h refers to the accumulation period for calculating SEL. SEL_{24h} thresholds are frequency weighted according to the marine mammal species hearing group. The following sections provide an evaluation on potential injury based on each marine mammal species hearing group.

LOW-FREQUENCY CETACEANS

Modelled distances to low-frequency cetacean PTS and TTS threshold criteria for continuous underwater sound predicted:

- 24 hr Auditory Injury criteria to be reached within 90 m (Scenario 4)
- 24 hr TTS criteria to be reached within 1.07 km (Scenario 4).

TTS and Auditory Injury SEL_{24h} thresholds is a cumulative metric that requires a receptor to be consistently exposed at this noise effect criteria for a 24-hour period for injury to occur. As a result, the potential of injury (TTS and Auditory Injury) to low-frequency cetaceans during the activity requires a low-frequency cetacean to be consistently exposed to vessel/MODU/drilling operations for a 24-hour period for injury to occur. Low-frequency cetaceans require to remain within 1.07 km of a vessel/MODU for at least a 24-hour period for injury to occur.

To identify low-frequency cetaceans that could be injured as a result of continuous underwater noise generated in the Operational Area, a search was conducted for EPBC Act listed species within a 1.07 km buffer of the Operational Area. The following low-frequency cetaceans were found:

- Blue whale, southern right whale (endangered, migratory)
- Fin whale, sei whale (vulnerable, migratory)
- Antarctic minke whale, Bryde's whale, humpback whale, pygmy right whale (migratory).

The area within a 1.07 km buffer of the Operational Area also overlaps 'possible foraging area' BIA for the pygmy blue whale, and the migration BIA for the southern right whale. Other marine mammals that may undertake biologically important behaviours (foraging, feeding or related behaviour likely in the likely to occur) in this area include the fin whale, pygmy right whale, and the sei whale.

The area within a 1.07 km buffer of the Operational Area does not contain habitats that encourages high-site fidelity for low-frequency cetaceans given the area does not overlap reproduction, known foraging area, foraging annual high use area BIAs for low-frequency cetaceans. Low-frequency cetaceans in this area are not expected to remain for extended periods and are expected to transit through. Given the intermittent and short-duration of continuous underwater sound emissions (Section 5.8.1), the limited spatial area (within 1.07 km from the vessel/MODU) where injury may occur, and that low-frequency cetaceans in a 1.07 km buffer of the Operational Area are expected to transit through and not remain in the area for extended periods, potential injury to low-frequency cetaceans from continuous underwater sound is not considered credible and not considered further.

HIGH AND VERY HIGH-FREQUENCY CETACEANS

Table 5-23 details the high and very high-frequency cetacean noise effect criteria for Auditory Injury and TTS and the maximum distances at which modelling estimated these criteria are reached. In summary:

- High-frequency cetaceans: TTS SEL_{24h} thresholds were predicted within maximum distance of 130 m from the sound source. Auditory Injury was not predicted.
- Very high-frequency cetaceans: Auditory Injury and TTS SEL_{24h} thresholds were predicted within maximum distances of 130 m and 1.06 km from the sound source, respectively.

The potential of injury (TTS and Auditory Injury) to high and very high-frequency cetaceans during the activity requires a high or very high-frequency cetacean to be consistently exposed to vessel/MODU/drilling

operations for a 24-hour period for injury to occur. Conservatively, high and very high-frequency cetaceans require to remain within 1.06 km of a vessel/MODU for at least a 24-hour period for injury to occur.

To identify high and very high-frequency cetaceans that could be injured as a result of continuous underwater noise generated in the Operational Area, a search was conducted for EPBC Act listed species within a 1.06 km buffer of the Operational Area. The following high and very high-frequency cetaceans were found:

- Dusky dolphin, killer whale, sperm whale (migratory).

These high and very high-frequency cetaceans may occur within a 1.06 km buffer of the Operational Area, but no BIAs of biologically important behaviours were identified. High and very high-frequency cetaceans (if present) are expected to be transiting through this area.

The area within a 1.06 km buffer of the Operational Area does not contain habitats that encourages high-site fidelity for high and very high-frequency cetaceans given the area does not overlap BIAs for high and very high-frequency cetaceans. High and very high-frequency cetaceans in this area are not expected to remain for extended periods and are expected to transit through. Given the intermittent and short-duration of continuous underwater sound emissions (Section 5.8.1), the limited spatial area (within 1.06 km from the vessel/MODU) where injury may occur, and that high and very high-frequency cetaceans in a 1.06 km buffer of the Operational Area are expected to transit through and not remain in the area for extended periods, potential injury to high and very high-frequency cetaceans from continuous underwater sound is not considered credible and not considered further.

PINNIPEDS

Table 5-23 details the otariid pinnipeds noise effect criteria for Auditory Injury and TTS and the distances at which modelling estimated these criteria are reached. For otariid pinnipeds, the maximum distances to TTS noise effect criteria was predicted within 160 m from the sound source. Auditory Injury was not predicted.

The long-nosed fur-seal and the Australian fur-seal may occur in the Operational Area and surrounds but no BIAs or haul out areas were identified. SEL_{24h} thresholds is a cumulative metric that requires a receptor to be consistently exposed at this noise effect criteria for a 24-hour period for injury to occur. As a result, the potential of injury to otariid pinnipeds during the activity requires an otariid pinniped to be consistently exposed to continuous underwater noise for a 24-hour period for injury to occur.

The Operational Area and surrounds does not contain habitats that encourages high-site fidelity for otariid pinnipeds given the area does not overlap BIAs or haul out areas for otariid pinnipeds. Otariid pinnipeds in this area are not expected to remain for extended periods and are expected to transit through. Given the intermittent and short-duration of continuous underwater sound emissions (Section 5.8.1), the limited spatial area (within 160 m from the vessel/MODU) where injury may occur, and that otariid pinnipeds in a 160 m buffer of the Operational Area are expected to transit through and not remain in the area for extended periods, potential injury to otariid pinnipeds from continuous underwater sound is not considered credible and not considered further.

5.8.2.4. First Nations Cultural Heritage Values and Sensitivities

The intrinsic link between First Nations people and culturally significant species are understood to be based on First Nations obligations to care for the species (Weir, 2012). The management of culturally significant species is considered to be applied to the species at a population level. As a result, impacts to culturally significant species at a population level has the potential to disrupt the intrinsic link of First Nations people ability to care for culturally significant species.

FISHES

Culturally significant food sources such as fish are located within and migrate through the south-east marine region. Fish were one of the main food resources in coastal areas and cultural heritage listed fish traps can still be found in this region. Many coastal First Nations groups, including the Gunaikurnai and Bunurong people used coastal areas for marine resources and continue to engage in cultural and spiritual significant coastal practices which include subsistence fishing and collecting of other coastal resources in this area (Gunaikurnai Land and Waters Aboriginal Corporation, 2015; Biosis, 2024; NOO, 2002b).

Potential Disruption to Cultural Heritage Values and Sensitivities

Fish are an important resource for First Nations people identified during a review of relevant First Nations group Country Plans and NOO (2002b). First Nations people have a responsibility to care for fish and their habitats to ensure resources can be continued for future generations (NOO, 2002b). Disruptions to species and habitats have the potential to affect the success of populations, which can affect the cultural practices associated with coastal resource fishing and collection.

As discussed in Section 5.8.2.1, potential impacts are assessed as Slight (1) for fish which is unlikely to have a significant impact on individuals at a population level and are not expected to impact the value of culturally significant species. As such, the intrinsic link between environmental receptors and First Nations people's cultural heritage values and sensitivities is expected to be maintained.

CETACEANS

First Nations people around Australia have long had a strong connection to whales and dolphins, which has significance as totemic ancestors to some groups. Cetaceans in Sea Country hold deep cultural significance to First Nations groups of the South-East marine region and feature in Dreaming stories, ceremony, song and dance traditions (NOO, 2002b).

Cetaceans are culturally significant species for the First Nations peoples as identified during a review of relevant First Nations group Country Plans and NOO (2002b). First Nations people have a cultural responsibility to ensure cetaceans that reside within and migrate through Sea Country are cared for and healthy and their habitat is sustained. Whales feature in Dreaming stories, ceremony, song and dance of some First Nations groups along the coasts of Australia. The protection of whale species is paramount to First Nations groups of the South-East marine regions spiritual, physical wellbeing and it is the responsibility of First Nations people to care for Sea Country and protect the species for present and future generations. Whales are also a food resource, and First Nations people still collect parts of beached whales, as has been done for thousands of years (NOO, 2002b).

As discussed in Section 5.8.2.3, EPBC threatened and migratory cetaceans may be present within the ensonification area.

Potential Disruption to Cultural Heritage Values and Sensitivities

First Nations people may have kinship and/or a responsibility to care for culturally significant species and their habitats. Impacts to species at a population level may inhibit First Nations people's ability to perform cultural obligations to care for culturally significant species and their habitats. If responsibilities have not been met it could result in a sense of powerlessness to members of First Nation groups responsible for the protection and care of these species (Holcombe, 2022).

As discussed in Section 5.7.2.4, impacts for whales is assessed as Minor (2) which is unlikely to have a significant impact on individuals at a population level. As such, the intrinsic link between environmental receptors and First Nations people's cultural heritage values and sensitivities is expected to be maintained.

It is to be noted that through a review of Country Plans, publicly available information, and consultation, that turtles have not been identified as a culturally significant species for the First Nations people of this region.

5.8.3. Cumulative Impacts

The Judith-2 operational area is on the western edge of the Gippsland Basin Area To Be Avoided surrounding the Esso Australia operated Gippsland Basin Joint Venture producing & non-producing assets. The planned short duration geophysical and geotechnical surveys, as detailed in this EP, are not considered to add to cumulative impacts to the greater Gippsland Basin, nor are any concurrent survey operations known presently. Specific to the drilling activity, the planned jack-up MODU to be used, would move to Emperor Energy following the completion of the ongoing campaign being conducted by Esso Australia on their Gippsland Basin assets.

The closest offshore wind farm feasibility license (Navigator North) is approximately 35 km away from the Operational Area. This development was placed on hold by the operator in September 2025 with no survey or construction activities expected in the foreseeable future.

No barriers to migration or movement of species were identified from activities conducted under this EP. Therefore, no cumulative impacts were identified.

5.8.4. ALARP Demonstration

Impacts from continuous underwater noise emissions are relatively well understood, supported by the existing and growing body of scientific literature and in situ observations. However, inherent variability in individual animal responses introduces a degree of uncertainty when predicting specific reactions. To reduce uncertainty, noise modelling was conducted for the Judith-2 activities to define the potential spatial extent of impact.

For blue whales and southern right whales there is some uncertainty with regards to the threat of underwater noise emissions as recognised in the CMP for blue whales and the National Recovery Plan for Southern right whales. As a precautionary approach for this uncertainty, these plans recommend additional mitigation measures and adaptive management strategies for specific activities and times of year.

Continuous underwater noise emissions are considered a standard operation, given vessel operations and drilling activities in the Bass Strait are well practiced. The resulting potential impacts have no conflicts with company values, no partner interests, and no significant media interests.

Based on these factors, Emperor Energy has assigned potential impacts from continuous underwater noise emissions as an ALARP Decision Context: Type A for all receptors apart from blue whales and southern right whales.

For blue whales and southern right whales, Emperor Energy has assigned potential impacts from continuous underwater noise emissions as an ALARP Decision Context: Type B. The Type B decision was based on recognising the greater uncertainty with regards to the potential impacts to blue whales and southern right whales and additional control measures that are required to ensure project activities are aligned with the objectives and relevant actions defined in the CMP for blue whales and the National Recovery Plan for Southern right whales to ensure potential impacts are ALARP.

5.8.5. Adopted Control Measures

ALARP Decision context Type B assigned for continuous underwater noise highlights additional controls may be required to ensure impacts can be managed to an acceptable level.

Table 5-24 lists and justifies adopted controls and provides evidence against additional controls assessed to ensure impacts associated with continuous underwater noise is acceptable.

Table 5-24: Adopted Control Measures: Continuous Underwater Sound Emissions

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
CM12: EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans (All activities)	EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans describes strategies to ensure whales and dolphins are not harmed during offshore interactions with vessels and helicopters. Vessels will adhere to EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans in relation to distances to cetaceans. These regulations stipulate a safe operating distance of 300 m. Helicopters will adhere to EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans in relation to distances to cetaceans.
CM13: Whale Management Procedure (All activities)	The Whale Management Procedure (see Section 8.4.5) details the controls to prevent possible displacement impacts to foraging pygmy blue whale and migrating southern right whales. Prior to an activity commencing, a pre-activity survey will be undertaken for activity-specific survey zones. The survey zones for continuous sound generating activities include: • Mobilisation, MODU positioning, demobilisation: 5.5 km • Drilling operations: 2.5 km • Drilling operations with a vessel on standby: 3.5 km • Drilling operations with a vessel undertaking resupply operations: 5.5 km • Well P&A and removal (i.e. wellhead cutting): 3.5 km. These survey zones are considered practicable given whale observations are possible up to 7 km from a vessel bridge height of ~20 m. The survey zones are based on the distance to the behaviour effect criteria, as detailed in Table 5-23, and have been rounded up to take into account accuracy of estimation of distance at sea. A conservative approach will be adopted whereby it is assumed that all whales present in the survey zones are conducting biologically important behaviours (e.g. foraging blue whales, migrating southern right whales). Visual surveys will be undertaken for 30 minutes prior to the activity commencing. If a whale is sighted within the survey zone the activity will not commence until: • No whales are observed for 30 minutes within the survey zone; or • Whales are observed leaving the survey zone.

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
	The period of 30 minutes is deemed as sufficient time to observe deep diving whales such as blue whales and southern right whales based on blue whale foraging behaviour and dive duration and southern right whale migration behaviours (Section 4.6.4.1). Once the activity has commenced, whales entering these zones after the start of the activity are not considered displaced, as their foraging or migrating behaviour is deemed uninterrupted—they have continued these behaviours despite the presence of operational noise from the activity. This is supported by observations during Beach Energy's drilling activities in the Otway Basin, presented in Section 4.6.4.1, which implies that there is no displacement of blue whales within 3,000 m of the MODU. These observations are consistent with the general understanding that stable, continuous sources are less likely to elicit strong avoidance than sudden or high-level impulsive sounds, particularly when a whale enters the field voluntarily after the activity has commenced, which implies that there is no displacement of blue whales within 3,000 m of the MODU. These observations are consistent with the general understanding that stable, continuous sources are less likely to elicit strong avoidance than sudden or high-level impulsive sounds, particularly when a whale enters the field voluntarily after the activity has commenced. This approach aligns with: • Conservation Management Plan for the Blue Whale (CoA 2015a) Anthropogenic noise in BIAs will be managed such that any blue whale continues to utilise the area … and is not displaced from a foraging area., • National Recovery Plan for the Southern Right Whale (DCCEEW 2024), and DAWE (2021) definitions. Anthropogenic noise in BIAs will be managed such that risk of behavioural disturbance is minimised and it does not prevent any southern right whale from utilising the area … Activities can commence at night or in low visibility conditions (i.e., when observations cannot be undertaken) if no more than three whales have been seen in the survey zone in the preceding daylight hours and there was a two-hour period of no sightings in the survey zone. The no more than three whales criterion is acceptable for blue whales because it indicates the krill stock at the location has been diminished. More than three whales within the previous daylight hours may indicate a large krill supply and more whales could be expected. The daylight hours is justified because it is the longest possible continuous observation period (i.e., one full day of observations). Three southern right whales would be an indication that there is an increased likelihood of a southern right whale within the survey zone during the period that observations cannot be undertaken.
CM14: Marine Fauna Observer (All activities)	Marine fauna sighting coverage will be maintained during pre-activity surveys in accordance with Emperor's Whale Management Procedure (Section 8.4.5). The MODU and vessels will have at least one appropriately trained crew member on active duty who has completed the MFO Program Induction and is capable of supporting marine fauna observations.

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
	For all relevant pre-activity surveys (Table 8-3) each support or survey vessel will have at least one dedicated Lead MFO, sourced from a specialist MFO service provider or equivalent such as RPS and Blue Planet Marine, who is experienced and competent in detecting and identifying large baleen whales—particularly blue whales and southern right whales.
CM08: Planned Maintenance System (All activities)	Power generation and propulsion systems on the vessels and MODU will be maintained in accordance with manufacturer specifications as detailed within the PMS.

Table 5-25 lists the additional control measures and considers each against the principle of gross disproportionality between the sacrifice (cost, time, effort) of implementation and the reduction in risk or impact and environmental benefit.

Table 5-25: Consideration of Additional Control Measures

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
Seasonal timing	Pygmy blue whales may possibly forage within the continuous noise EMBA from November through to June. Southern right whales may travel through the continuous noise EMBA to and from coastal aggregation and migration areas during May-June and September-November. It is safe to assume there is no period when there is not a whale undertaking a biologically important behaviour within the continuous noise EMBA. The implementation of additional controls above the legislative requirements of the EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans will be implemented to manage potential impacts to whales undertaking biologically important behaviour.	No
Anchoring of the vessels	This control is not feasible for the support vessels based on: Vessel standby activities require the vessel to be able to react immediately in the event of an issue on the platform.	No
Passive acoustic monitoring (PAM)	PAM is most useful in the detection of odontocetes such as sperm whales, dolphins and porpoise known to emit regular distinctive clicks and high frequency calls during long dives. PAM has limited utility in detecting lower frequency calls of baleen whales (such as blue whales, southern right whales) especially when in the presence of constant background low frequency sound such as that generated by the vessel towing the PAM system. Given the very low utility and associated unreliability of using PAM to inform mitigation decision making, any additional cost is considered disproportionate to the benefit gained.	No

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
Dedicated monitoring vessel	An additional dedicated vessel to conduct visual surveys is not required as monitoring activities can be effectively conducted from the geophysical vessel or support vessel. MFO observations from the support vessel is expected to be limited to 7 km from a vessel bridge height of ~20 m. This range of observation provides the capability of undertaking the pre-activity survey zone ranges as defined in CM13: Whale Management Procedure. As a result, the cost and subsequent potential discharges of operating an additional dedicated vessel is disproportionate to the marginal environmental benefit gained.	No
Aerial surveillance	Aerial surveillance from aircraft or drones is not required as monitoring activities can be effectively conducted from the survey or support vessel. Cost is disproportionate to marginal environmental benefit.	No
Vessel-based observations while on route to the OA at the start of the activity and prior to / during MODU moves (All activities)	Vessel-based observations prior to arrival on location increase the confidence that there are no whales undertaking important behaviours within the OA. There are no additional costs associated with this control as the crew and personnel on the support vessel are already trained in the process of visual observations. Therefore, this control has been adopted into the Whale Management Procedure.	Yes (CM13: Whale Management Procedure)
Satellite imagery	Satellite imagery is considered excessive and impractical to reduce the potential impacts from underwater noise when compared to the use of MFOs and pre-activity surveys. The acquisition cost of satellite imagery (to detect whales) is expensive to task and acquire, especially for broad ocean areas required during a survey. The window of opportunity is limited by the satellite's orbit and revisit time, which often does not align with the real-time, continuous monitoring that can be met using MFOs. The process of acquiring the image, downlinking the data, processing it for whale detection, and relaying the result to the vessel in real-time introduces significant, often unacceptable, time delays. As a result of these factors, the use of satellite imagery is considered grossly disproportionate to the environmental benefit gained.	No
Infrared cameras	Infrared cameras for use by MFOs to detect marine mammals at night is considered disproportionate the minimal environmental benefit gained. The cost and complexity of installing and integrating specialised, stabilised IR systems for a short-term drilling campaign is	No

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
	considered an unreasonable sacrifice relative to the benefit gained.	
Autonomous underwater vehicles (AUVs)	AUVs used to detect marine mammals underwater is considered a disproportionate cost of time and effort for the minimal environmental benefit gained. The expense, logistical effort, and technical risk associated with deploying an AUV system for a brief drilling campaign greatly outweighs the modest increase in detection reliability over the existing, cost-effective use of MFOs.	No
Limiting support vessel thrusters	Limiting support vessel thrusters is considered a disproportionate measure to reduce underwater noise during the activity. The safety requirement to maintain uncompromised Dynamic Positioning (DP) capability, essential for station-keeping during all activities (including resupply) and severe weather, outweighs the marginal noise reduction benefit.	No
Relocating support vessels (Drilling only)	Relocating the support vessel outside the PSZ during resupply activities (using the second support vessel acting in a resupply capacity) is adopted as a reasonably practicable control to reduce continuous underwater noise. This measure effectively decreases the number of active sound sources operating near the MODU during periods when DP is engaged for several hours by the resupply vessel, thereby reducing the overall underwater noise footprint within the exclusion zone. The support vessel can continue to fulfil its required safety-critical functions—including vessel-interaction sentry duties, emergency response readiness, and PSZ monitoring—from positions outside the PSZ while still maintaining rapid response capability. Implementing this measure does not compromise maritime safety obligations and provides a tangible environmental benefit for minimal operational cost or sacrifice. The relocation of the support vessel outside the PSZ during resupply activities is therefore considered ALARP, as it delivers a meaningful reduction in noise emissions without impairing safe operations. Relocation of support vessels is not required during other drilling phases where continuous underwater noise does not increase above routine drilling operations, where proximity of support vessels is operationally essential for helicopter standby etc.	Yes (CM41)
MFO during the entire activity	The ongoing use of an MFO for the entire duration of the activity will not be implemented as an underwater noise control measure. MFO coverage is limited to pre-survey activities under CM13 because, once operations commence,	No

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
	whales entering the zone are not considered displaced—their foraging or migration behaviour continues despite operational noise. This interpretation aligns with the *Conservation Management Plan for the Blue Whale* (CoA, 2015a), the *National Recovery Plan for the Southern Right Whale* (DCCEEW, 2024), and DAWE (2021) definitions. Continuous underwater noise emissions from drilling and vessel operations are comparable to routine offshore activities in the region (e.g., fishing and shipping). These emissions are temporary, localised, and negligible at a population level given the high natural variability of the environment and the transient nature of marine fauna. Applying MFO coverage throughout the entire activity would be grossly disproportionate to the environmental benefit, consistent with ALARP principles, because: • Existing controls (CM08, CM12, CM13, CM14) already reduce residual risk to ALARP. These include EPBC Act interaction protocols, the Whale Observation Management Procedure, and MFO deployment for pre-activity surveys. • Additional monitoring would not further reduce risk beyond ALARP and would impose significant cost and logistical burden without meaningful environmental benefit. Therefore, continuous MFO coverage is not justified as it does not provide a reasonable or proportionate improvement in environmental protection.	
MFO during resupply	The ongoing use of an MFO for resupply will not be will not be implemented as an underwater noise control measure. Resupply activities involve short-duration vessel manoeuvring at slow speed within the Drilling Area which generates low-level, localised continuous underwater noise that is broadly comparable to routine commercial vessel operations already present in the region. Modelling indicates that noise from resupply does not approach behavioural disturbance thresholds associated with higher-risk activities such as VSP, 2D geophysical surveying, or MODU positioning. Given the short-duration of resupply activities and the limited spatial extent of potential impact, a trained Vessel Officer of the Watch—already competent in watchkeeping and provided with activity-specific induction and whale ID training—provides an appropriate and effective pre-activity visual clearance check. Requiring a dedicated MFO for every resupply event would deliver negligible additional environmental benefit while imposing added operational complexity, HSE exposure (e.g., congested deck space) and disproportionate cost. As	No

ADDITIONAL CONTROLS	COST/BENEFIT ANALYSIS	CONTROL IMPLEMENTED?
	resupply is shared across both support vessels, dedicating MFOs would effectively require full-time placement for the entire activity duration. Given the minimal incremental risk reduction and the effectiveness of a trained Vessel Officer of the Watch undertaking pre-activity survey, dedicated MFO coverage is not reasonably practicable for resupply. Therefore, MFO coverage during resupply is not justified as it does not provide a reasonable or proportionate improvement in environmental protection.	

5.8.6. Acceptability Determination

Potential impacts from continuous underwater sound emissions are considered acceptable based on meeting the acceptability criteria as defined in Section 2.7. Table 5-26 details the evaluation of the potential impacts against each acceptability criterion.

Table 5-26: Acceptability determination

ACCEPTABILITY CRITERIA	DETERMINATION
To meet the principles of ESD	Continuous underwater sound emissions were assessed as having a Minor (2) impact severity level which is not considered as having the potential to result in serious or irreversible environmental damage. Consequently, no further evaluation against the principles of ESD is required. Further, quantitative modelling has been undertaken to remove some of the scientific uncertainty associated with this aspect. As such, the activity is consistent with the principles of ESD.
Internal context	The proposed management of the impact is aligned with the Emperor Energy HSE Policy (APPENDIX A). Activities will be undertaken in accordance with the Implementation Strategy (Section 8).
External context	There have been no stakeholder objections or claims regarding continuous underwater sound emissions.
Other requirements	Continuous underwater sound emissions will be managed in accordance with legislative requirements. Those related to this aspect include: • Recovery Plan for Marine Turtles in Australia (CoA, 2017a). • Conservation Management Plan for the Blue Whale (CoA, 2015a). • Recovery Plan for the Southern Right Whale (DCCEEW, 2024c). • Recovery Plan for the White Shark (CoA, 2013). • Conservation Advice for Fin Whales (TSSC, 2015b) • Conservation Advice for Sei Whales (TSSC, 2015c) • South-east Marine Parks Network Management Plan 2025 (DNP, 2025)

ACCEPTABILITY CRITERIA	DETERMINATION
	Relevant legislative requirements that provide explicit actions against this aspect are detailed below. Relevant conservation advice or management plans that identify underwater sound as a threat but do not provide explicit requirements are not detailed below. Emperor Energy considers the adopted control measures as detailed in Section 5.7.5 will manage the potential impacts from this aspect to ALARP and acceptable levels.

Requirement	Demonstration
Conservation Management Plan for the Blue Whale (CoA 2015) Assessing the effect of anthropogenic noise on blue whale behaviour. Anthropogenic noise in BIAs will be managed such that any blue whale continues to utilise the area without injury and is not displaced from a foraging area.	Section 5.8.2.3 assesses the effects of anthropogenic noise from the activity on blue whale behaviour. Section 5.8.2.3 demonstrates that the activity can be conducted in a manner that is consistent with the conservation management plan and will not result in injury or displacement of pygmy blue whales from a foraging BIA. Section 5.8.5 details the adopted controls to manage anthropogenic noise from Program Activities such that any blue whale continues to utilise the area without injury and is not displaced from a foraging area. Having met these requirements, Program Activities are considered to be not inconsistent with the Conservation Management Plan for the Blue Whale.
National Recovery Plan for the Southern Right Whale (DCCEEW 2024) Anthropogenic noise in BIAs will be managed such that risk of behavioural disturbance is minimised and it does not prevent any southern right whale from utilising the area or cause auditory impairment (TTS and PTS). Ensure environmental assessments associated with underwater noise generating activities include consideration of national policy (e.g. EPBC Act Policy Statement 2.1) and guidelines related to managing	Section 5.8.5 details the adopted controls to manage anthropogenic noise to: • Minimise the risk of behavioural disturbance and does not prevent any southern right whale from utilising the area or cause auditory impairment (TTS and auditory injury). • Consider national policy and guidelines to manage anthropogenic noise and reduce potential impacts to southern right whales to ALARP.

ACCEPTABILITY CRITERIA		DETERMINATION
	anthropogenic underwater noise and implement appropriate mitigation measures to reduce risks to southern right whales to the lowest possible level. Quantify risks of anthropogenic underwater noise to southern right whales, including behavioural disturbance, changes to vocalisations, and physiological effects to whales.	Section 5.8.2.3 assesses the effects of anthropogenic noise on southern right whales and considers relevant national policy and guidelines. Section 5.8.2.3 assesses the effects of anthropogenic noise on southern right whales using underwater acoustic modelling (Lui et al. 2025; APPENDIX F). Having met these requirements, Program activities are considered to be not inconsistent with the National Recovery Plan for the Southern Right Whale.
	Conservation Advice for fin and sei whales (TSSC 2015, TSSC 2016) An assessment of the impacts of increasing anthropogenic noise (including from seismic surveys). Ensure fin and sei whales ongoing recovery.	Section 5.8.2.3 assesses the effects of anthropogenic noise on fin and sei whales using underwater acoustic modelling (Lui et al. 2025; APPENDIX F). Section 5.8.5 details the adopted controls to manage anthropogenic noise to ensure fin and sei whales ongoing recovery. Having met these requirements, Program activities are considered to be not inconsistent with the Conservation Advice for fin and sei whales.
	Recovery Plan for Marine Turtles in Australia (CoA 2017) Management action A1.5: Manage anthropogenic activities to ensure marine turtles are not displaced from identified habitat critical to the survival. Management action A1.6: Manage anthropogenic activities in BIAs to ensure that biologically important behaviour can continue.	Section 5.8.2.2 details how underwater sound emissions generated by Program Activities are not predicted to impact on the recovery of marine turtles given no important marine turtle habitats are within the ranges to noise effect criteria. Having met these requirements, Program Activities are considered to be not inconsistent with the Recovery Plan for Marine Turtles in Australia.
	South-east Marine Parks Network Management Plan 2025 (DNP 2025) Offshore petroleum activities under the NOPSEMA EPBC Program do	Section 7 provides evidence of consultation with the DNP in the preparation of this EP and the submission of this EP to NOPSEMA

ACCEPTABILITY CRITERIA	DETERMINATION	
	not require additional assessment or authorisation by the Director of National Parks because the endorsed program takes account of impacts and risks to marine park values in a manner that satisfies the Director. Further, where the proposed activity is within an Australian Marine Park or may impact the marine park values, the Director is consulted in the preparation of environmental plans under the OPGGS Act.	for acceptance as required under the OPGGS Act.
Acceptability outcome	Potential impacts from continuous underwater sound emissions are considered **Acceptable** having met all the acceptability criteria as detailed above. Implementing the adopted control measures listed in Section 5.8.5 will ensure the following EPOs will be met: **EPO11:** Underwater noise emissions from Project Activities in BIAs will be managed such that: • Any blue whale continues to utilise BIAs without injury and is not displaced from a foraging area. • It does not prevent any southern right whale from utilising BIAs or habitat critical to the survival of a species or cause auditory impairment (TTS and Auditory Injury). • Biologically important behaviours can continue whilst Project Activities are being undertaken. By meeting the above EPO, it will ensure potential impacts will be at or below the defined acceptable levels.	

5.9. Accidental Release – Loss of Well Control

5.9.1. Aspect Source

The activity may result in the accidental release of formation fluid through a loss of well control (LOWC) event during drilling activities (Section 3.6).

Exploration well drilling introduces the risk of a LOWC event. LOWC refers to the uncontrolled flow of formation fluids due to the failure of surface equipment or procedures (Holand 2017). A LOWC can occur due to several factors, often related to equipment failure, procedural errors, or unexpected formation pressures. This section deals with the higher order (most severe) spill scenarios. The Worst-Case Discharge for the Judith-2 well has been modelled and evaluated below.

5.9.2. Hydrocarbon Assumptions

The Judith-2 well is planned to test the 4 Judith and 3 Longtom sands in the 8½ inch hole section. The expected reservoir fluid is lean gas with the potential for condensate to be present.

Emperor Energy has confidence in the estimated release rates and timing used for the modelling as they are based on known reservoir properties and flow rates. Release rates and volumes are based on a total loss of containment which assumes the failure of multiple control systems. The subsequent spill modelling was based on a broadly acceptable industry estimated duration of 77 days, which represents the time to implement a full dynamic well kill via the drilling of a relief well.

5.9.2.1. Flow Rate

Based upon the proposed well design and expected reservoir characteristics, worst case discharge (WCD) dynamic blowout modelling was undertaken (Schlumberger, 2022) to estimate the potential flow rate during a credible WCD due to a total loss of well control. An updated WCD model was performed in 2025, based on the newly interpreted reservoir properties, which resulted in a WCD liquid volume being 4% less than the 2022 model. Due the results being almost identical, the spill trajectory modelling already undertaken in 2022 was deemed valid. The WCD modelling for Judith-2 assumed all sands exposed in the 8½" hole section, with a 9⅝" casing set above the reservoir interval. The scenario was simulated with the following data and assumptions, which align with NOPSEMA's Source Control Planning and Procedures Paper IP1979 (NOPSEMA, 2021) that requires realistic modelled scenarios that reflect maximum credible flow conditions:

- No drill string in the hole
- Zero mechanical skin
- Flow through open/cased hole to the surface
- No additional restrictions in the flow path (hole collapse etc.).

The results of the 2025 modelling are:

- Day 1 WCD rates were modelled at 496 MMscf/day of gas and 4,960 stb/day condensate for a CGR of 10 stb/MMscf.
- The depleted flow rate after 77 days is 381 MMscf/day gas and 3,810 stb/day condensate.
- Approximately 333,774 stb of condensate and 33.3 Bscf of gas could be expelled within 77 days during the blowout.

For reference, the results of the 2022 modelling are:

- Day 1 WCD rates were modelled at 274.3 MMscf/day of gas and 5,870.9 stb/day condensate for a CGR of 21.4 stb/MMscf.
- The depleted flow after 77 days is 147.4 MMscf/day gas and 3,153.6 stb/day condensate.
- Approximately 347,584 stb of condensate and 16.3 Bscf of gas could be expelled within 77 days during the blowout.

5.9.2.2. Hydrocarbon Characteristics

Reservoir modelling had indicated that the condensate is likely to have an API of 54.6, which is equivalent to a density of 760 kg/m^3. The chosen proxy for spill modelling (RPS 2022) has a low viscosity of 0.875 cP and the volatile to semi-volatile components (boiling point (BP) < 265°C) represent approximately 83% of the

whole condensate which is likely to evaporate over the first few days if exposed to the atmosphere at local temperatures, leaving the low volatile portion (16%) to progressively evaporate more slowly over a longer period. Only 1% of the condensate is considered persistent and will decay over time. It is classified as a Group I non persistent oil.

5.9.2.3. Hydrocarbon Spill Modelling

Hydrocarbon spill modelling was undertaken by RPS (2022) for the following worst-case scenario:

- An uncontrolled subsea LOWC releasing a total of 347,584 bbl (or 55,256 m^3) of condensate depleting over 77 days (average daily rate of 4,514 bbl/day or 717 m^3 /day).

The spill modelling was performed using an advanced three-dimensional trajectory and fates model, Spill Impact Mapping Analysis Program (SIMAP). The SIMAP model calculates the transport, spreading, entrainment and evaporation of spilled hydrocarbons over time, based on the prevailing wind and current conditions, and the physical and chemical properties.

The SIMAP model can track hydrocarbons to levels lower than biologically significant or visible to the naked eye. Therefore, reporting thresholds have been specified (based on the scientific literature) to account for "exposure" on the sea surface and "contact" to shorelines at meaningful levels.

It is noted that spill modelling by RPS (2022) is based on a conservative flow rate that is 4% greater than the predicted flow rate as defined in Section 5.9.2.1. It is also noted that the release location for the LOWC event modelled by RPS (2022) was based on an early preliminary well location that has since been updated. The modelled release location is approximately 1,792 m to the northwest of the new well location and was modelled with the same prevailing wind and current conditions, and the physical and chemical hydrocarbon properties. The combination of these environmental factors leads to a similar transport, spreading, entrainment and evaporation of spilled hydrocarbons over time, where results from the modelled release location will be representative of a LOWC event at the well location for the Project Activities.

5.9.2.4. Thresholds

Based on available information, concentration thresholds for use in the impact assessment have been defined for the different exposure types (surface, in-water, shoreline) (Table 5-27). These impact thresholds and exposure pathways are then applied at a receptor level for use in the consequence evaluations.

These thresholds align with the NOPSEMA environmental bulletin 'Oil Spill modelling' (NOPSEMA 2019) (Table 5-27) and are consistent with NOPSEMA's most recent recommendations (NOPSEMA 2025a) (Table 5-28). Variations between NOPSEMA (2019) and NOPSEMA (2025) are presented in Table 5-28.

The hydrocarbon exposure thresholds detailed in Table 5-27 are considered appropriate to:

- Predict potential hydrocarbon contact at conservative (low exposure) concentrations and inform the description of the environment (Section 4), inform the EPBC Protected Matters Search APPENDIX B) and identify the Australian Marine Park (AMP), Marine National Park (MNP), Marine Park (MP), and Ramsar wetlands that may require monitoring in the event of a worst-case discharge based upon conservative (low exposure) in-water thresholds.
- Inform the oil spill impact and risk evaluation.
- Inform oil spill response planning based upon potentially actionable concentrations of hydrocarbons (see Section 1.5 of the OPEP) and potential monitoring requirements (see Section 6.1.2).

Table 5-27: Hydrocarbon exposure thresholds (NOPSEMA 2019)

	EXPOSURE THRESHOLD		
EXPOSURE TYPE	**LOW**	**MODERATE**	**HIGH**
Floating (surface)	1 g/m^2	10 g/m^2	50 g/m^2
Shoreline (accumulated)	10 g/m^2	100 g/m^2	1,000 g/m^2
Dissolved	10 pb	50 ppb	400 ppb
Entrained	10 ppb	-	100 ppb

Table 5-28: Hydrocarbon exposure thresholds (NOPSEMA 2025)

	EXPOSURE THRESHOLD		
EXPOSURE TYPE	**LOW**	**MODERATE**	**HIGH**
Floating (surface)	1 g/m^2	10 g/m^2	50 g/m^2
Shoreline (accumulated)	10 g/m^2	100 g/m^2	1,000 g/m^2
Dissolved	10 pb	50 ppb	300 ppb
Entrained	10 ppb	100 ppb	1,000 ppb

NOPSEMA (2025a) recognises these as conservative screening criteria for defining the EMBA, and as suitable for screening ecological, social, economic and cultural features potentially exposed to hydrocarbons in an offshore spill scenario.

The thresholds adopted in this EP also align with the stochastic modelling undertaken by RPS (2022). Accordingly, the EMBA reflects the maximum credible spatial extent of potential hydrocarbon exposure and intentionally represents an "outer bound" scenario to ensure that no potentially affected receptor is excluded from assessment.

The risk evaluation in the EP (Section 5.9.3) is undertaken using the exposure thresholds relevant to each receptor type as defined in each evaluation subsection. Whilst recent updates to recommended exposure values have been published (NOPSEMA 2025a), the risk evaluations resulting from hydrocarbon exposure within the EP remain valid because the original thresholds (NOPSEMA 2019) are highly conservative and continue to reflect toxicologically relevant exposure pathways.

Floating and shoreline exposure thresholds remain aligned with earlier recommendations (NOPSEMA 2019) and indicate the concentrations at which response techniques are most effective.

NOPSEMA (2025a) introduces refined dissolved and entrained thresholds, using Polycyclic Aromatic Hydrocarbons (PAH) for dissolved exposure and Total Hydrocarbons (THC) for entrained exposure. PAH represents the bioavailable, toxic fraction of hydrocarbons, with French McCay (2025) demonstrating that ecotoxicological effects in the water column are primarily driven by dissolved phase exposure. By contrast, THC represents the total concentration of oil droplets, of which only a small proportion is bioavailable, and which is rapidly depleted during weathering (Negri et al. 2025).

While "high" dissolved exposure thresholds have been revised to 300 ppb (NOPSEMA 2025a), this EP retains the original conservative value of 400 ppb (NOPSEMA 2019). RPS (2022) predicted no receptor exposure exceeding 400 ppb. Dissolved exposure thresholds at moderate levels (50 ppb) remain unchanged.

Negri et al. (2025) notes that the entrained exposure thresholds recommended by French McCay (2025) and NOPSEMA (2025a) are inherently conservative in offshore assessments because offshore exposure durations are typically short (hours), whereas threshold derivation used longer (~48 hr) laboratory exposures. As weathering rapidly depletes the soluble toxic fraction from entrained droplets, there is little evidence of acute toxicity from weathered droplets, and they may not be acutely toxic. French McCay (2025) further indicates that entrained oil concentrations must be substantially higher (~1,000–3,000 ppb THC) to approach levels associated with biological effects, reinforcing that earlier NOPSEMA thresholds (10 ppb) are highly precautionary screening values rather than effect based toxicological thresholds. Consistent with this, Negri et al. (2025) notes that legacy NOPSEMA entrained oil thresholds (10 ppb) are at least 100-fold more conservative than effect-based THC thresholds and therefore remain suitable for screening.

Given that dissolved phase hydrocarbons are the primary driver of ecotoxicological effects, and entrained thresholds remain conservatively low, the impact assessment in this EP, particularly for a LOWC event, remains appropriately precautionary. The approach satisfies Regulation 21(5) and Regulation 21(6) of the OPGGS(E) Regulations.

5.9.2.5. Spill Modelling Results

Table 5-29 provides a summary of the results from the stochastic modelling report for the worst-case credible LOWC (RPS, 2022; APPENDIX C). The EMBA displayed in Figure 4-1 to identify the environment that may be affected has been based on the low exposure threshold for surface, shoreline, and in-water (dissolved and entrained). The risk evaluation (Section 0) is based on the exposure thresholds relevant to each receptor as defined in each evaluation subsection.

Table 5-29: Summary of the spill modelling results for the worst-case credible LOWC (RPS, 2022)

EXPOSURE VALUES	SUMMARY OF WORST-CASE PREDICTED EXPOSURE
Surface Exposure (Figure 5-1 & Figure 5-2)	
Low (1 g/m^2)	The maximum distance for floating hydrocarbon exposure from the source was predicted to be 202.2 km during winter conditions. Three and a half days (3.4) is the minimum time for floating hydrocarbon exposure to reach Victorian State Waters (East Gippsland nearshore waters) during summer conditions. Point Hicks MNP is expected to be exposed to surface hydrocarbons within 5 days of the LOWC based on winter conditions. The probability of intersect with Victorian State Waters is 23% during winter conditions.
Moderate (10 g/m^2)	The maximum distance for floating hydrocarbon exposure from the source was predicted to be 18.3 km during summer conditions and 15.1 km during winter conditions. No exposure was predicted to any receptor(s) at this threshold.
High (50 g/m^2)	The maximum distance for floating hydrocarbon exposure from the source was predicted to be 0.4 km during winter conditions. This threshold was not reached during summer conditions.

EXPOSURE VALUES	SUMMARY OF WORST-CASE PREDICTED EXPOSURE
	No exposure was predicted to any receptor(s) at this threshold.
Shoreline Exposure (Figure 5-3 & Figure 5-4)	
Low (10 g/m^2)	The highest probability of accumulation at this threshold on any shoreline was 98%, with the absolute minimum time for shoreline accumulation predicted in 70 hours (2.92 days), and the maximum length of shoreline accumulation predicted to be 79 km, all during winter conditions. East Gippsland had the highest probability for shoreline accumulation at 89% with shoreline accumulation occurring within 3 days during winter conditions. The maximum volume of oil ashore was forecast for East Gippsland at 28 m^3 also during winter conditions. East Gippsland recorded the maximum length of shoreline accumulation at this threshold of 68.3 km during winter conditions. Available hydrocarbon response (recovery) measures generally have limited effectiveness at the low threshold, with natural degradation likely to be the response option with the highest net environmental benefit (NOPSEMA 2025).
Moderate (100 g/m^2)	East Gippsland had the highest probability for shoreline accumulation at this threshold at 18% with shoreline accumulation occurring within 150 hours (6.25 days) during winter conditions. The maximum volume of oil ashore was forecast for East Gippsland at 28 m^3 during winter conditions. The maximum length of shoreline accumulation at this threshold is predicted to be 3.6 km for both summer and winter conditions. Shoreline loading at the moderate threshold is likely to require clean-up (NOPSEMA 2025).
High (500 g/m^2)	No exposure at this threshold was predicted.
In-Water Exposure – Dissolved (Figure 5-5 & Figure 5-6)	
Low (10 ppb)	The maximum distance for dissolved hydrocarbons at this exposure from the source was predicted to be 1,039 km during winter conditions. The following receptors have a 60% probability or more of exposure during winter conditions: • East Gippsland AMP • Big Horseshoe Canyon KEF • Cape Howe MNP • Point Hicks MNP • Bega Valley nearshore waters • East Gippsland nearshore waters • Gabo Island nearshore waters • NSW and Victorian state waters
Moderate (50 ppb)	The maximum distance for dissolved hydrocarbons at this exposure from the source was predicted to be 898 km during winter conditions.

EXPOSURE VALUES	SUMMARY OF WORST-CASE PREDICTED EXPOSURE
	The following receptors have a 60% probability or more of exposure during summer conditions: Victorian state waters and Cape Howe MNP has the highest probability of exposure 65% and 60% respectively during winter conditions.
High (400 ppb)	The maximum distance for dissolved hydrocarbons at this exposure from the source was predicted to be 186 km during summer conditions. There was no exposure predicted for any receptor at concentrations above 400 ppb.
In-Water Exposure – Entrained (Figure 5-7 & Figure 5-8)	
Low (10 ppb)	The maximum distance for entrained hydrocarbons at this exposure from the source was predicted to be 917 km during summer conditions. The following receptors have a 60% probability or more of exposure during summer conditions: • Beagle AMP • East Gippsland AMP • Big Horseshoe Canyon KEF • Point Hicks MNP • Kent Group National Park • Bega Valley nearshore waters • East Gippsland nearshore waters • Gabo Island nearshore waters • Kent Group Island nearshore waters • NSW, Victorian and Tasmanian state waters
High (100 ppb)	The maximum distance for entrained hydrocarbons at this exposure from the source was predicted to be 578 km from the release location during winter conditions. Victorian state waters and Cape Howe MNP has the highest probability of exposure 78% and 74% respectively during summer conditions.

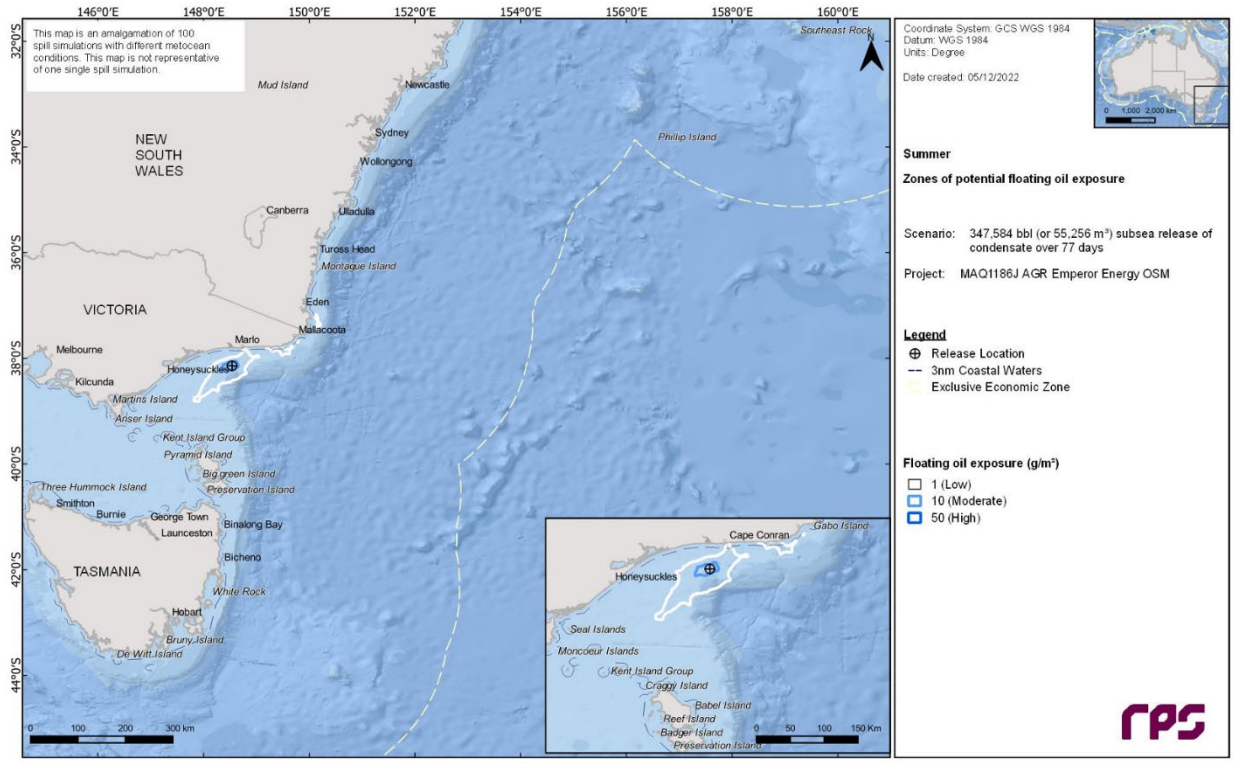


Figure 5-1 Zones of potential floating hydrocarbon exposure from a subsea LOWC during summer conditions

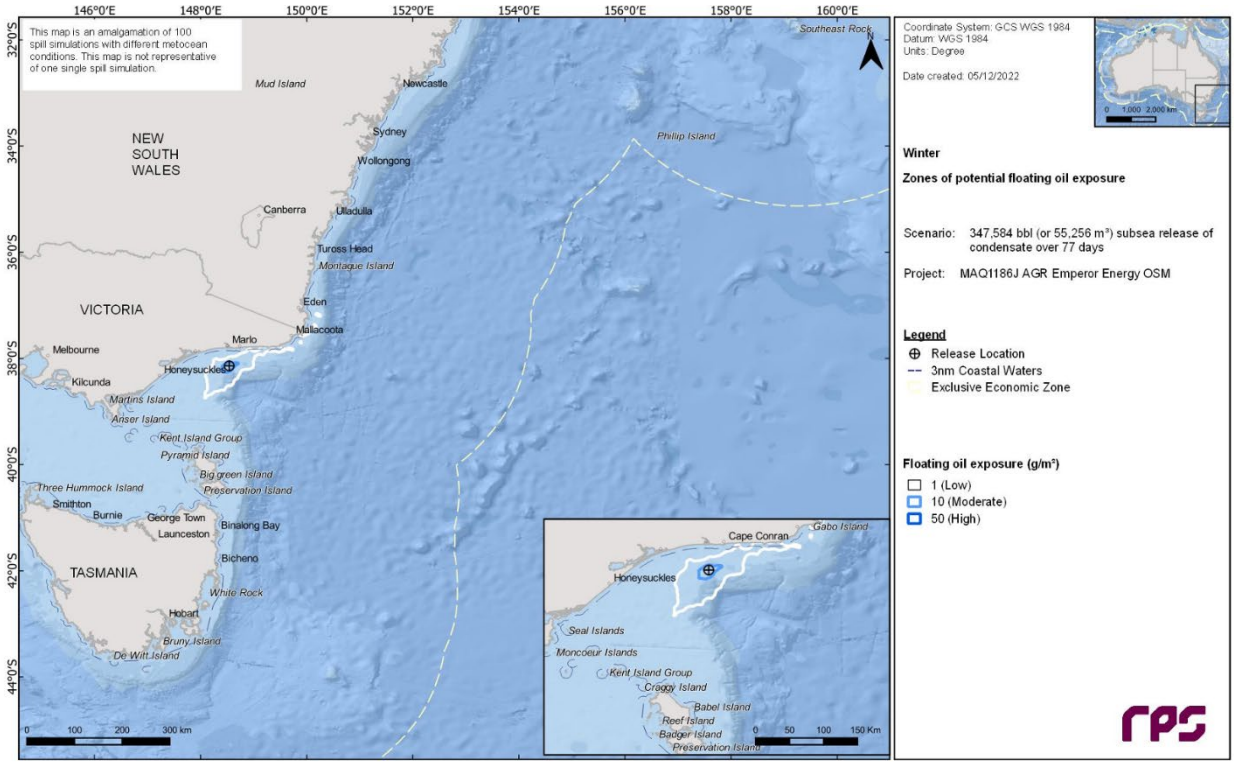


Figure 5-2 Zones of potential floating hydrocarbon exposure from a subsea LOWC during winter conditions

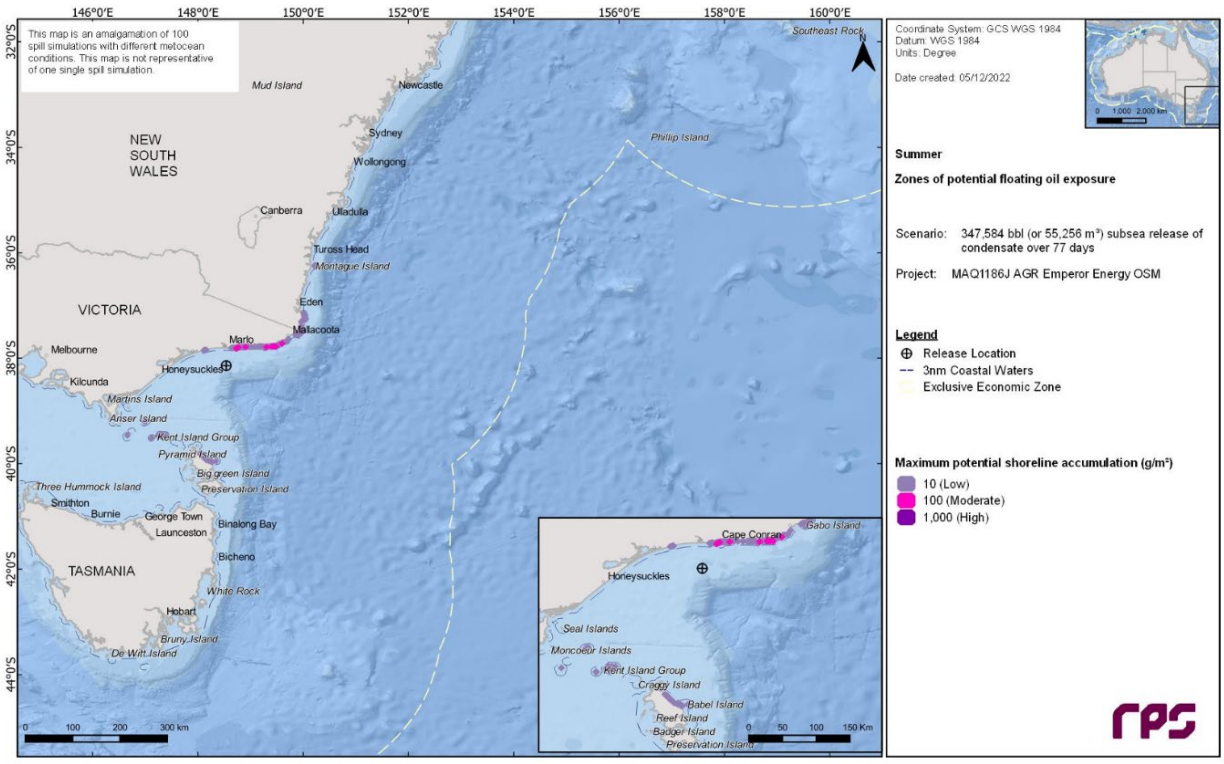


Figure 5-3 Maximum potential shoreline loading from a subsea LOWC during summer conditions

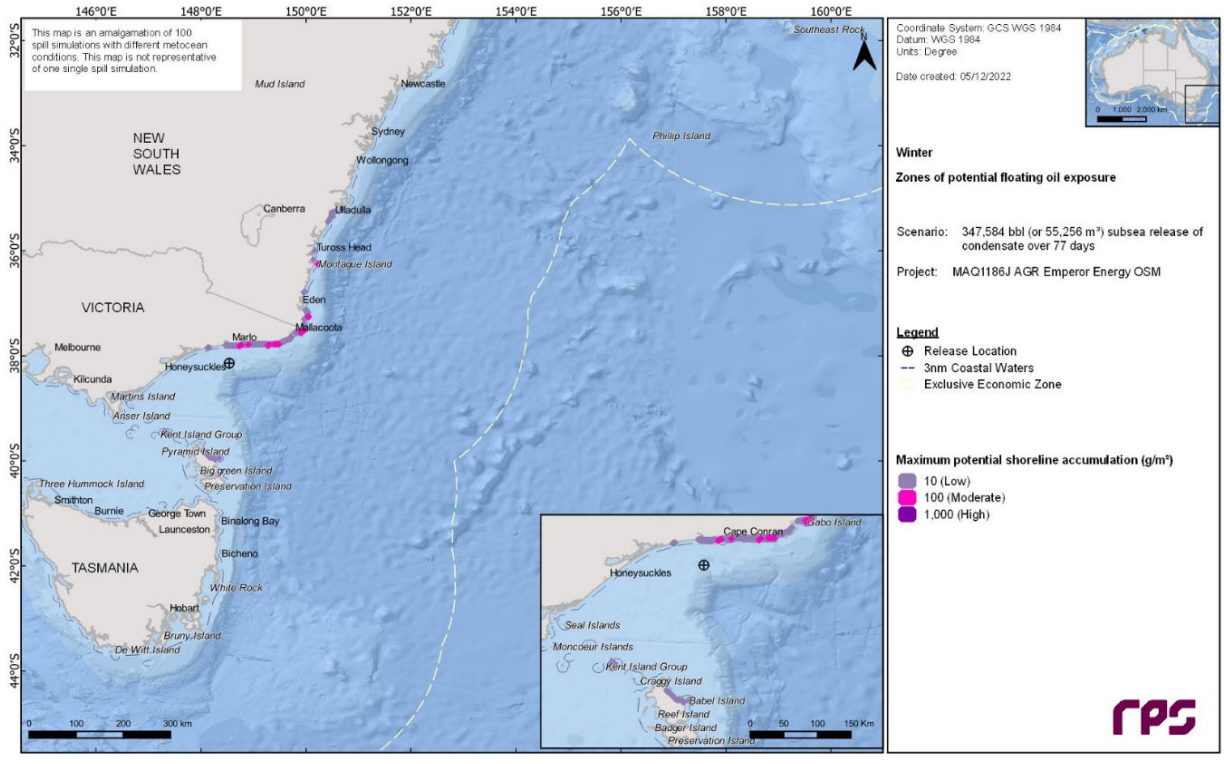


Figure 5-4 Maximum potential shoreline loading from a subsea LOWC during winter conditions

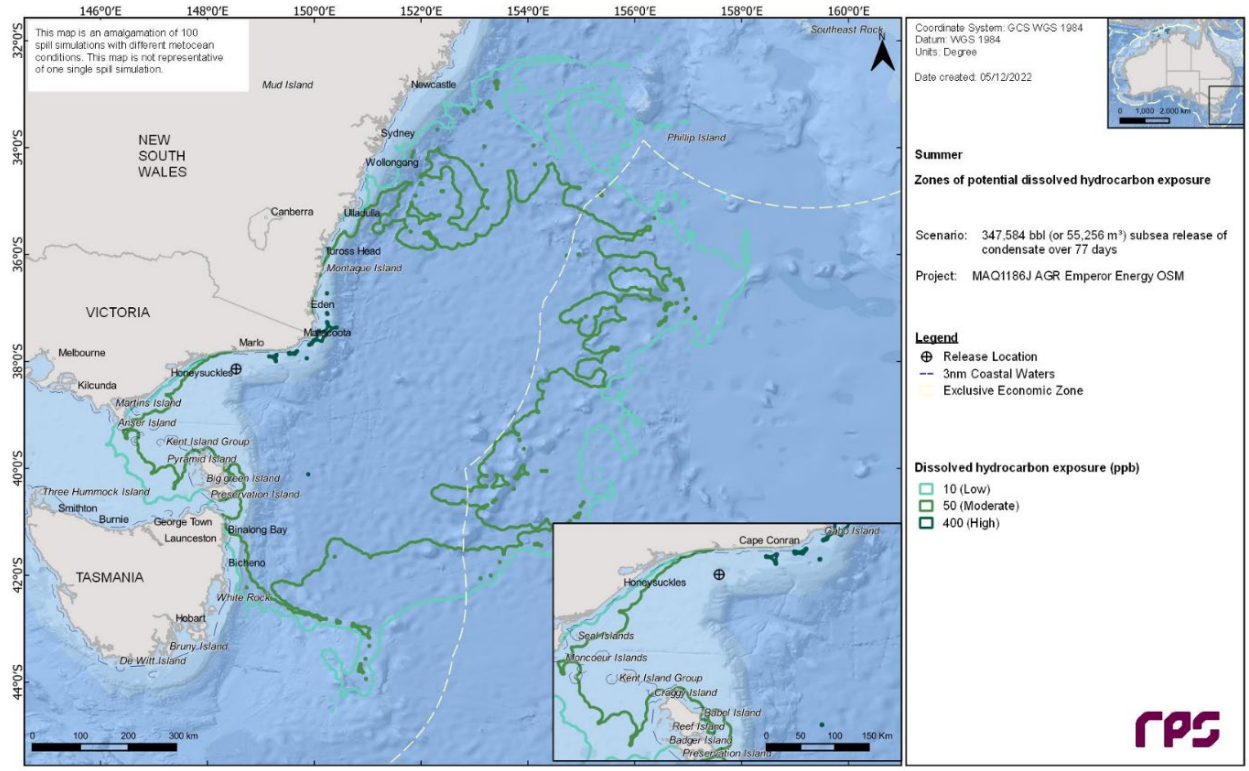


Figure 5-5 Predicted zones of dissolved hydrocarbon exposure from a subsea LOWC during summer conditions

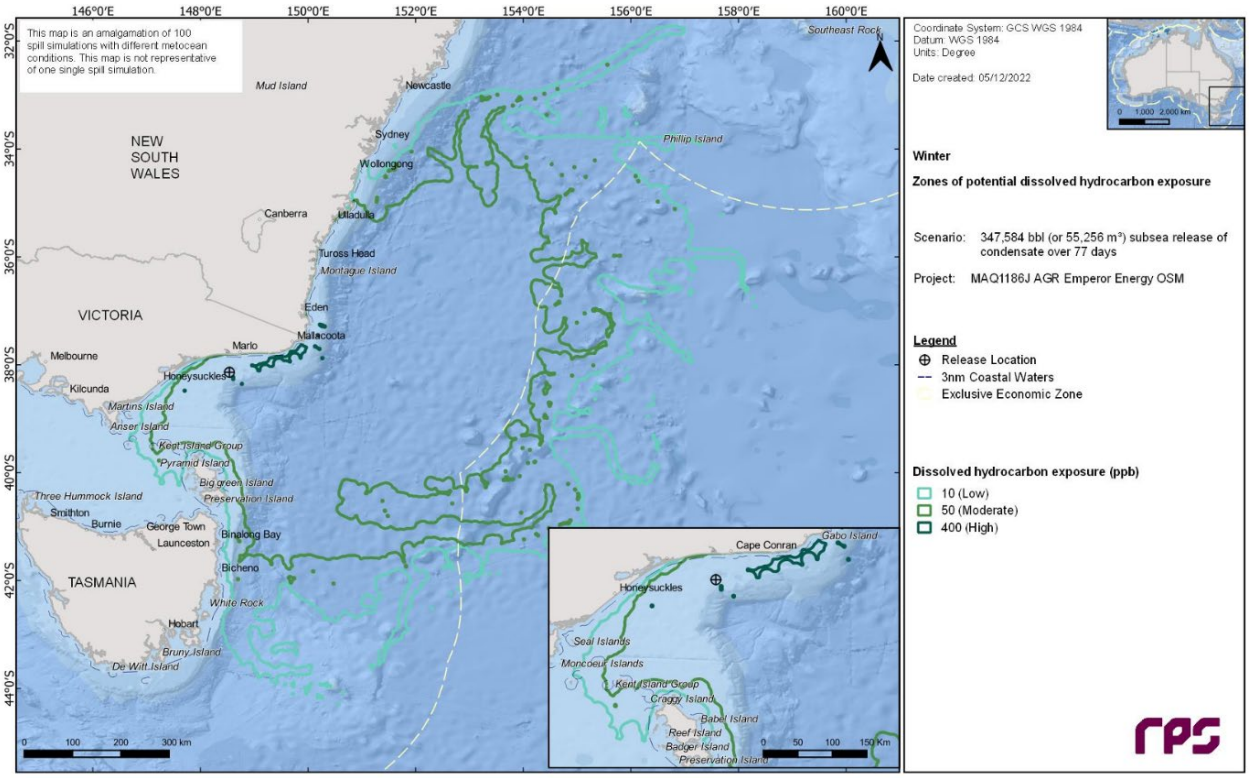


Figure 5-6 Predicted zones of dissolved hydrocarbon exposure from a subsea LOWC during winter conditions

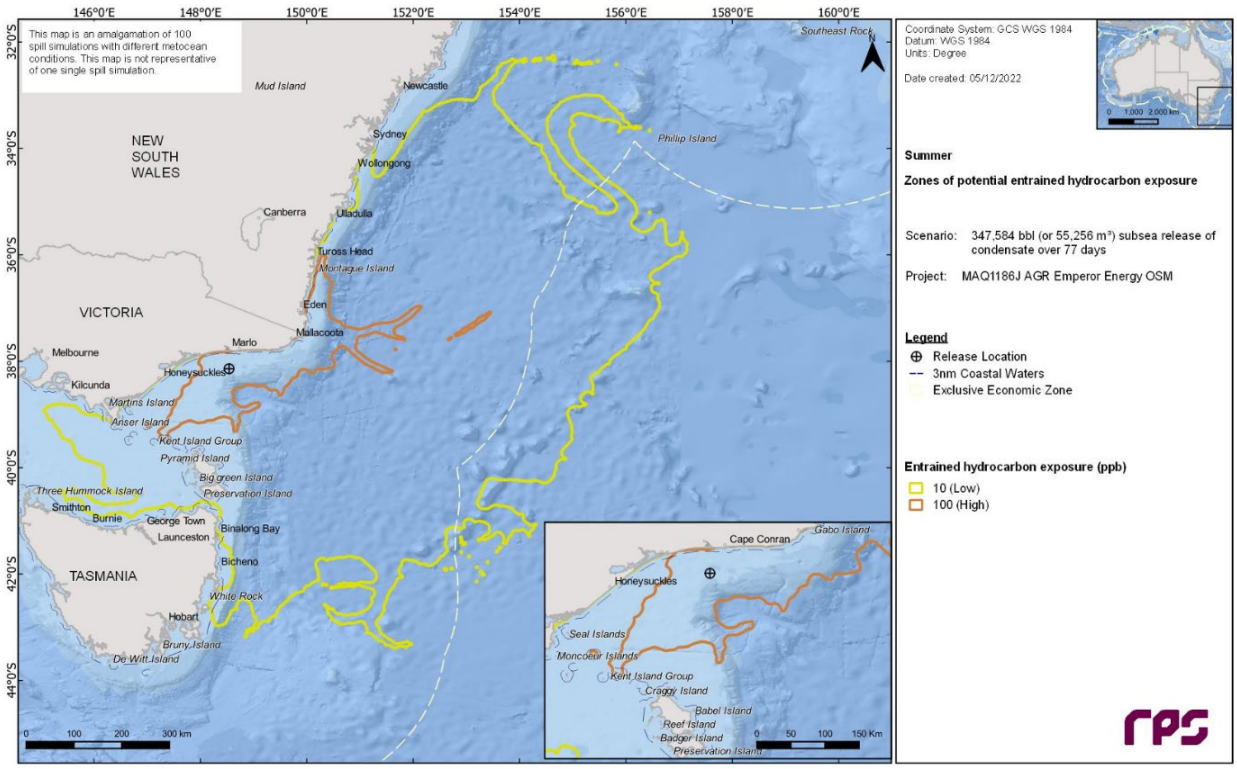


Figure 5-7 Predicted zones of entrained hydrocarbon exposure from a subsea LOWC during summer conditions

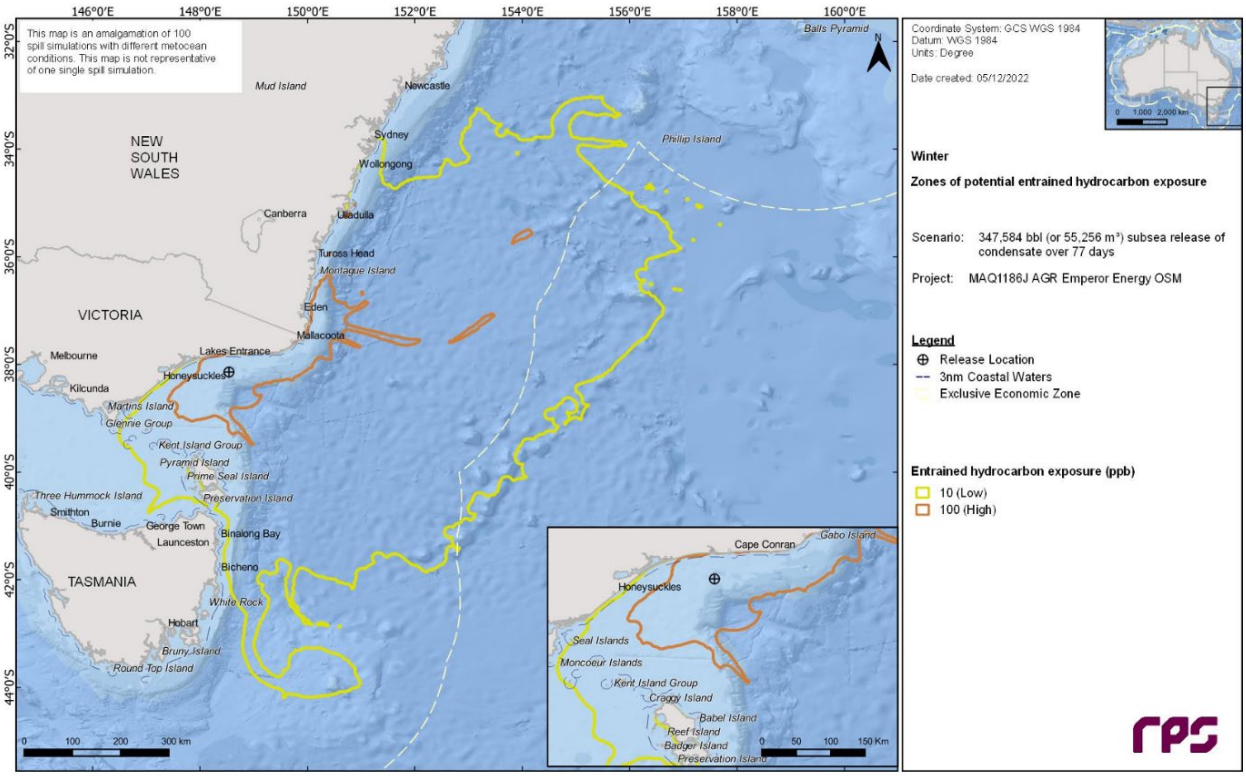


Figure 5-8 Predicted zones of entrained hydrocarbon exposure from a subsea LOWC during winter conditions

5.9.3. Risk Evaluation

The presence of hydrocarbons in the environment introduces the following risks to environmental receptors:

- change in water quality
- injury / mortality to fauna
- change in fauna behaviour
- change in ecosystem dynamics
- changes to the functions, interests or activities of other users.

To assess whether an impact may occur, modelled LOWC hydrocarbon extent predictions were compared to hydrocarbon exposure threshold levels for surface, shoreline and in-water hydrocarbons (Table 5-29).

5.9.3.1. Surface Hydrocarbons

Based on the hydrocarbon exposure modelling predictions (RPS, 2022) as summarised in Section 5.9.2.3 and 5.9.2.5, surface water hydrocarbons may impact:

- Seabirds and shorebirds
- Marine reptiles
- Pinnipeds
- Cetaceans (whales and dolphins)
- Recreation and tourism (recreational fisheries)
- Industry (shipping)
- Industry (oil and gas)
- First Nations cultural heritage values and sensitivities.

Table 5-30 presents the risk assessment for surface hydrocarbons to these receptors.

Table 5-30: Risk evaluation to ecological receptors within the EMBA – sea surface

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
Marine Fauna	Seabirds	Change in fauna behaviour Injury/mortality to fauna	Several listed Threatened, Migratory and/or listed marine species have the potential to be rafting, resting, diving and feeding within 19 km of the release location predicted to be exposed to moderate levels of surface hydrocarbons. Foraging BIAs for several albatross species are present in the area affected by the moderate threshold (Section 4.6.2). Foraging, breeding and migration BIAs are identified within the area for several petrel and tern species. Several shearwater species and the Black-Faced Cormorant were also identified to have foraging and breeding BIAs present in the area affected by the moderate threshold (Section 4.6.2). Foraging and breeding BIAs for Little Penguins are within the EMBA (Section 4.6.2).	Seabirds rafting, diving or feeding within the hydrocarbon EMBA (moderate exposure) have the potential to directly contact surface hydrocarbons. Shearwaters rest on the sea surface and albatrosses and petrels feed by plunge-diving, resulting in an increased risk of exposure. Oiling of seabird feathers affects their ability to thermoregulate resulting in hypothermia. A bird suffering from cold, exhaustion (resulting from fouling of plumage) may dehydrate, drown or starve (ITOPF 2011a, CoA, 2022). Foraging seabirds may continue to forage within slicks and, oil may also be ingested if a bird attempts to preen its feathers. Direct contact with surface hydrocarbons during foraging may result in toxic effects, including damage to external tissues, including skin and eyes, as well as internal tissue irritation in their lungs and stomachs (ITOPF 2011). The potential consequence of direct contact with hydrocarbons will depend on the amount consumed and other factors influencing the bird's health and sensitivity. Acute or chronic toxicity impacts (death or long-term poor health) to birds making contact close to the spill source at the time of the spill (i.e. areas of concentrations >10 g/m^2 out to <19 km from the release location) are possible but unlikely for a condensate spill because of the limited period of exposure above 10 g/m^2 (as volatile surface hydrocarbons (83%) are expected to evaporate over 3-4 days). However, the absence of critical habitat or sensitive aggregation sites for EPBC Act listed birds within the hydrocarbon EMBA (moderate exposure) for LOWC reduces the potential for impact to these species to negligible at the population level. Seabirds with foraging BIAs in the hydrocarbon EMBA (moderate exposure) for LOWC are highly pelagic species. Therefore, potential impact would likely be limited to individuals, however, impacts to aggregations may occur.

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				The consequence of a LOWC event to seabirds is assessed as Major (4). No long-term effects are expected, however, impacts leading to the death of a small number of EPBC Act listed birds may occur due to their presence within foraging BIAs. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to seabirds to eventuate. As described above, there are no critical habitat or aggregation sites for EPBC listed birds within the EMBA and foraging BIAs overlapping the EMBA are for highly pelagic species, limiting the potential for a spatial and temporal overlap of seabirds with the surface hydrocarbons from an LOWC event. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to injury / mortality to birds is assessed as Rare (1). The risk rating for injury / mortality to birds from an accidental release – LOWC during the activity is ranked Medium (4).
	Marine reptiles (including marine turtles)	Change in fauna behaviour Injury/mortality to fauna	There may be marine turtles in the area predicted to be exposed to surface hydrocarbons. However, no BIAs or habitat critical to the survival of the species have been identified within this area. No other marine reptile was identified within the EMBA.	Marine turtles are vulnerable to the effects of oil at all life stages. Marine turtles can be exposed to surface oil externally (i.e. swimming through oil slicks) or internally (i.e. swallowing the oil). Marine turtles make large, rapid inhalations before they dive which may result in inhalation of toxic vapours from hydrocarbons in surface waters (Milton and Lutz, 2003). Ingested oil can harm internal organs and digestive function. Oil on their bodies can cause skin irritation and affect breathing. Furthermore, Ylitalo *et al.* (2017) identified that visibly oiled turtles showed higher indicators of PAH in tissues, stomach content, colon content and faeces compared to non-visibly oiled turtles. Oiling has the potential to cause mortality depending on the size of the individual and the extent of oiling (DWH Natural Resource Damage Assessment Trustees, 2016).

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				No habitat critical to the survival of the species have been identified in the area, and no BIA has been designated in the region of the LOWC EMBA. The number of marine turtles that may be exposed to condensate is expected to be low due to their limited and transient presence in the area. Surface oiling area is expected to reduce quickly, with the majority (85%) of the hydrocarbon volume predicted to have evaporated within a few days of release (3-4 days). Therefore, potential impact would be limited to individuals, with population impacts not anticipated. Marine pollution is listed as a threat to marine turtles within the Recovery Plan for Marine Turtles in Australia 2017-2027 (CoA 2017a), particularly in relation to shoreline oiling of nesting beaches. There are no nesting beaches within the EMBA, and the activity will be conducted in a manner which is not inconsistent with the relevant management actions. The potential consequence to marine turtles from a LOWC event is assessed as Minor (2) based on the potential for localised and short-term impacts to species of recognized conservation value but not affecting local ecosystem functioning. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of the North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to marine reptiles to eventuate. As described above, there are no critical habitat or BIAs for marine turtles within the EMBA, limiting the potential for a spatial and temporal overlap of marine turtles with the surface hydrocarbons from an LOWC event. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to injury / mortality to marine reptiles is assessed as Rare (1).

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				The risk rating for injury / mortality to marine reptiles from an accidental release – LOWC during the activity is ranked Low (2).
	Pinnipeds (seals and sea-lions)	Change in fauna behaviour Injury/mortality to fauna	There are two species of pinnipeds Australian Fur-seal and the Long-nosed Fur-seal that may occur in the area predicted to affected by surface hydrocarbons (see Table 4-6).	Pinnipeds are vulnerable to sea surface exposures as they spend much of their time on or near the surface of the water. Exposure to surface oil can result in skin and eye irritations and disruptions to thermal regulation. Oiling of pinnipeds can lead to hypothermia if the fur is affected, or poisoning if oil is ingested, resulting in reduced foraging and reproductive fitness or death (DSEWPaC 2013b). Fur seals are particularly vulnerable to hypothermia from oiling of their fur (however the characteristics of condensate mean this is not likely), as well as irritation to lungs if breathing in fumes (e.g. if feeding occurs in the area). Hook *et al.* (2016) report that seals appear not to be very sensitive to contact with oil, but instead to the toxic impacts from the inhalation of volatile components. No habitat critical to the survival of the species have been identified in the area, and no BIA has been designated in the region of the LOWC EMBA. The number of pinnipeds that may be exposed to condensate is expected to be low due to their limited and transient presence in the area. Surface oiling area is expected to reduce quickly with 85% of the condensate predicted to evaporate within a few days of the release (3-4 days). Therefore, potential impact would be limited to individuals, with population impacts not anticipated. Given that fur seals are vulnerable to hypothermia from oiling and poisoning from ingestion, the potential consequence to pinnipeds from a LOWC event is assessed as Severe (3) based on the potential for localised and short-term impacts to species of recognized conservation value but not affecting local ecosystem functioning. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to pinnipeds to eventuate. As described above, there are no critical habitat or BIAs for pinnipeds within the EMBA, limiting the potential for a spatial and temporal overlap of pinnipeds with the surface hydrocarbons from an LOWC event. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to injury / mortality to pinnipeds is assessed as Rare (1). The risk rating for injury / mortality to pinnipeds from an accidental release – LOWC during the activity is ranked Low (3).
	Cetaceans	Change in fauna behaviour Injury/mortality to fauna	Several Threatened, Migratory and/or Listed Marine cetacean species have the potential to be migrating, resting or foraging within an area predicted to be exposed to surface hydrocarbons. The following BIAs have been designated and overlap within the area exposed to surface hydrocarbons: • Pygmy Blue Whale foraging BIA • Southern Right Whale breeding and migration BIAs.	Physical contact by individual whales of condensate is unlikely to lead to any long-term impacts. Given the mobility of cetaceans, only a small proportion of the population would surface in the affected areas, resulting in short-term and localised consequences, with no long-term population viability effects. Helm *et al.* (2015) detailed that oil does not adhere to cetacean's relatively slick skin and it would not be expected to accumulate in or around the eyes, mouth, blow hole, or other potentially sensitive external areas. Insulation is provided by a layer of blubber rather than hair or fur, so it is unlikely oil would compromise the thermoregulatory system of cetaceans. The inhalation of oil droplets, vapours and fumes is a distinct possibility if cetaceans' surface in slicks to breathe (Helm *et al.* 2015). Exposure to hydrocarbons in this way could damage mucous membranes and damage airways threatening their health. The risk is greatest near the source of a fresh spill because volatile toxic vapours disperse relatively quickly (Helm *et al.* 2015). Baleen whales (such as blue, fin, pygmy right and sei) are not particularly susceptible to ingestion of oil in the water column but are susceptible to oil at the sea surface as they feed by skimming the surface. Fouling of baleen plates is considered unlikely as the structural and chemical integrity of isolated baleen plates of seven species of whales were reported

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION

to remain intact when they were soaked in crude oil, gasoline, or tar over long periods (Helm *et al.* 2015).

The potential for population impacts to marine mammals following a LOWC event would need to coincide with a migration event to result in exposure of many individuals. Southern right whales and pygmy blue whales are pelagic (move freely in the oceans) and because of their migratory patterns may only be occasionally affected by surface hydrocarbons (AMSA 2022). Given the mobility and wide geographical distribution of marine mammals, only transient marine mammal individuals would be expected to surface in an area exposed to surface hydrocarbons, resulting in short-term consequences, with no long-term population viability effects (Helm et al. 2015).

Geraci (1988) found little evidence of cetacean mortality from hydrocarbon spills; however, some behaviour disturbance (including avoidance of the area) may occur. While this reduces the potential for physiological impacts from contact with hydrocarbons, active avoidance of an area may disrupt behaviours such as migration, or displace individuals from important habitat, such as foraging, resting or breeding. If whales are foraging at the time of the spill, a greater number of individuals may be present in the plume, however due to the rapid weathering of condensate and the short duration of the surface exposures at higher concentrations, this is not considered likely.

While avoidance of an area with a barely visible sheen (i.e. 0.1 g/m^2) is considered unlikely, it is acknowledged that this may occur within the aggregation areas. However, given that the area in which it is identified that the species will aggregate, as delineated by the BIA, is a small percentage of the total BIA area and that surface condensate is expected to rapidly weather, the risk of displacement to whales is considered low.

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				The potential consequence is assessed as Major (4) based on the potential for localised short-term impacts to species/habitats of recognised conservation value, but not affecting local ecosystem functioning. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to cetaceans to eventuate. As described above, as cetaceans are mobile, the likelihood of an individual surfacing at the time of the LOWC spill event is low. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to injury / mortality to marine mammals is assessed as Rare (1). The risk rating for injury / mortality to marine mammals from an accidental release – LOWC during the activity is ranked Medium (4).
Human systems	Recreation and tourism	Changes to the functions, interests or activities of other users and aesthetic values	Marine pollution can result in impacts to marine-based tourism from reduced visual aesthetic. Condensate is known to rapidly spread and thin out on release and consequently, a large area may be exposed to surface hydrocarbon.	Low exposure thresholds (1 g/m^2) are predicted up to 176.1 km ENE (summer) or 202.2 km NE (winter) of the release location. Receptors where low threshold surface oil is predicted include East Gippsland, Gabo Island, Cape Howe and Point Hicks. Visible surface hydrocarbons (i.e. rainbow sheen) have the potential to reduce the visual amenity of the area for tourism and discourage recreational activities. However, the relatively short duration, and distance from shore means there may be short-term and localised consequences, which are ranked as Minor (2) as they could be expected to result in localised short-term impacts. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				necessary for the worst-case consequences to recreation and tourism to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event impacting recreation and tourism is assessed as Rare (1). The risk a change to the functions, interests of activities of other users or aesthetic values affecting recreation and tourism from an accidental release – LOWC during the activity is ranked Low (2). Refer also to: • Marine Mammals (Pinnipeds, Cetaceans); and • State Marine Protected Areas.
	Coastal settlements	Changes to the functions, interests or activities of other users and aesthetic values	Marine pollution can result in impacts to coastal settlements from reduced visual aesthetic. Condensate is known to rapidly spread and thin out on release and consequently, a large area may be exposed to surface hydrocarbon.	Low exposure thresholds (1 g/m^2) are predicted up to 176.1 km ENE (summer) or 202.2 km NE (winter) of the release location. Receptors where low threshold surface oil is predicted include East Gippsland, Gabo Island, Cape Howe and Point Hicks. Visible surface hydrocarbons (i.e. rainbow sheen) have the potential to reduce the visual amenity of the area. However, the relatively short duration, and distance from shore means there may be short-term and localised consequences, which are ranked as Minor (2) as they could be expected to result in localised short-term impacts. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to coastal settlements to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event impacting recreation and tourism is assessed as Rare (1).

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				The risk a change to the functions, interests of activities of other users or aesthetic values affecting coastal settlements from an accidental release – LOWC during the activity is ranked Low (2).
	Marine and Coastal Industry (shipping)	Changes to the functions, interests or activities of other users	Shipping occurs within the area predicted to be exposed to surface hydrocarbons.	Exclusion zones or safety zones applied around the spill may lead to rerouting of commercial ships to avoid this, leading to delays, increased fuel consumption, and supply chain bottlenecks. However, due to the short duration of surface exposure (85% evaporated within a few days) the presence of these zones leading to changes in shipping routes would be localised and short term, consequently, the potential consequence is considered to be Slight (1). The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to marine and coastal industry to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event impacting industry (shipping) is assessed as Rare (1). The risk rating for changes to the functions, interests or activities of other users to industry (shipping) from an accidental release – LOWC during the activity is ranked Low (1).
	Marine and Coastal Industry (oil and gas)	Changes to the functions, interests or activities of other users	Oil and gas platforms are located within the area predicted to be exposed to surface hydrocarbons.	Oil and gas infrastructure is present in the area exposed to surface hydrocarbons, mostly concentrated to the south west (i.e. Esso operated assets). However, due to the short duration of surface exposure (85% evaporated within a few days) impacts would be localised and short term, consequently, the potential consequence is considered to be Slight (1). The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to marine and coastal industry to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event impacting industry (oil and gas) is assessed as Rare (1). The risk rating for changes to the functions, interests or activities of other users from an accidental release – LOWC during the activity is ranked Low (1).
	First Nations	Changes to the functions, interests or activities of other users and aesthetic values	First Nations people are intrinsically linked to Sea Country which encompasses lands, waterways, seas, cultural practices and values to which they are connected (AIATSIS 2022). Country is a cultural landscape which includes both tangible values (i.e. cultural heritage sites) and intangible values (i.e. creation stories and cultural practices). First Nations cultural concepts are directly connected with Country. Country describes all aspects of place, environment, spirituality, law and identity. Values of Country differ between First Nations groups, and not all First Nations groups and communities	Visible surface hydrocarbons have the potential to reduce the visual amenity of known culturally significant values identified within the marine environment, subsequently potentially impacting the value of the site to First Nations people. An unplanned hydrocarbon spill will impact the waters within Sea Country for a period while the spill disperses and weathers and has the potential to disrupt cultural values of Sea Country. The likelihood of a hydrocarbon spill occurring is assessed as highly unlikely and the actual area that may be affected from any single spill event would be considerably smaller than represented by the EMBA. Surface oiling area is expected to reduce quickly, with the majority (85%) of the hydrocarbon volume predicted to have evaporated within a few days of release (3-4 days). The potential consequence is assessed as Major (4) based on the potential for localised short-term impacts to species/habitats of recognised cultural value, but not affecting local ecosystem functioning or a disruption to cultural heritage values and sensitivities. Refer also to: • Seabirds and Shorebirds

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
			in Australia hold the same belief systems or spirituality. Connection to Sea Country is accompanied by a complexity of cultural rights and responsibilities. Coastal areas traditionally were amongst the most densely populated areas due to the abundance of resources available. Formal recognition of Sea Country rights is significantly slower compared to land rights. This could be for a range of reasons including conflicting perspectives and opinions on traditional custodianship of land and how far it extends (Smyth and Isherwood 2016). Hydrocarbon exposure may have the potential to impact the aesthetic and cultural values of Sea Country by the presence of physical hydrocarbons or the presence of oil spill responders.	• Marine Mammals The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to First Nations to eventuate. As described above, for marine fauna to be exposed to surface hydrocarbons, they will need to be present within the EMBA at the time of the LOWC event. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to a disruption to First Nations is assessed as Rare (1). The risk rating for disruption to cultural heritage value and sensitivities from an accidental release – LOWC during the activity is ranked Medium (4). As such, the intrinsic link between environmental receptors and First Nations people's cultural heritage values and sensitivities is expected to be maintained.

5.9.3.2. Shoreline Hydrocarbons

Based on the hydrocarbon exposure modelling predictions (RPS, 2022) as summarised in Section 5.9.2.5, shoreline hydrocarbons may impact:

- Seabirds and shorebirds
- Marine invertebrates
- Saltmarsh
- Wetlands and coastal settlements
- Recreation and tourism
- Heritage
- First Nations cultural heritage values and sensitivities.

Table 5-31 presents the risk assessment for shoreline hydrocarbons to these receptors.

Table 5-31: Risk evaluation to ecological receptors within the EMBA – shoreline Hydrocarbons

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
Marine Fauna	Seabirds and shorebirds	Change in fauna behaviour Injury/mortality to fauna	Listed marine, threatened and/or migratory bird species have the potential to be breeding, foraging, feeding, roosting or resting within the area potentially exposed to hydrocarbons ashore. These faunae can be present in wide range of habitats including sandy beaches and rocky shores (refer also to the exposure evaluation for these habitats). There are several seabird foraging, breeding and aggregation BIAs throughout the area, however these species are pelagic, oceanic foragers, not shoreline foragers. There are no shorebird BIAs that overlap the LOWC EMBA, as there is no critical habitat identified crucial to the survival of these species. However, the Curlew Sandpiper, Eastern Curlew and the Great Knot are all EPBC Act listed Critically Endangered species which may be found within the EMBA. Given hydrocarbons may wash ashore prior to weathering, there is the potential for both physical oiling and toxicity (e.g. surface contact or ingestion; particularly for shorebirds utilizing the intertidal area). Noting that these	Shoreline species may suffer both direct oiling and potential displacement from foraging and/or nesting sites. Direct oiling of nesting sites is considered unlikely as hydrocarbons would typically accrue within the upper swash zone, and nests would occur above this level on a beach. Therefore, acute or chronic toxicity impacts (death or long-term poor health) to small numbers of birds are possible, however this is not considered significant at a population level. Oiled fauna may track oil into their nests, which may then have subsequent impacts on any eggs present. Fresh crude was shown to be more toxic than weathered crude, which had a medial lethal dose of 21.3 mg/egg (Clarke 2010). Studies of contamination of duck eggs by small quantities of crude oil, mimicking the effect of oil transfer by parent birds, have been shown to result in mortality of developing embryos (French-McCay, 2009). This would be more of a risk for fauna, such as the Little Penguin, that must traverse the intertidal area to reach nesting sites. There are no known breeding locations for penguins along the mainland coast at risk of shoreline oil accumulation. In addition, given the volatility of the exposed oil, any impact to nests is expected to occur to individuals and not considered to pose a long-term risk at population level. Other species including the Curlew Sandpiper, Eastern Curlew and the Great Knot, may be present on shorelines within the EMBA, however there are no known BIA's or critical habitat for these species, within the EMBA. Therefore, the potential consequence to seabirds and shorebirds from shoreline hydrocarbon exposure event are considered to be Minor (2), as they could be expected to result in localised short-

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
			events will be temporary, so length of exposure is limited.	term impacts to species/habitats of recognised conservation value but not affecting local ecosystem functioning. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to seabirds and shorebirds to eventuate. Given that there are no shoreline bird BIAs in the EMBA and no known breeding locations for penguins, the potential for shorebird to be exposed is considered to be low. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event impacting shorebirds and seabirds is assessed as Rare (1). The risk rating for injury / mortality to shorebirds and seabirds from an accidental release – LOWC during the activity is ranked Low (1).
	Marine Invertebrates	Change in fauna behaviour Injury/mortality to fauna	Invertebrates that live in intertidal zones include crustaceans, molluscs and infauna, and can be present in wide range of habitats including sandy beaches and rocky shores (refer also to the exposure evaluation for these habitats). Exposure to hydrocarbons for invertebrates is typically via direct contact and smothering but can also occur via ingestion.	The impact of oil on any marine organism depends on the toxicity, viscosity and amount of oil, on the sensitivity of the organism and the length of time it is in contact with the oil. Acute or chronic exposure, through surface contact, and/or ingestion can result in toxicological impacts, reproductive impacts, smothering and potentially cause death. However, the presence of an exoskeleton (e.g. crustaceans) will reduce the impact of hydrocarbon absorption through the surface membrane. Other invertebrates with no exoskeleton and larval forms may be more sensitive to impacts from hydrocarbons. Exposure to microscopic oil droplets may also impact aquatic biota either mechanically (especially filter feeders) or act as a conduit for exposure to semi-

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				soluble hydrocarbons (that might be taken up by the gills or digestive tract) (French-McCay 2009). Toxicity is primarily attributed to water soluble PAHs, specifically the substituted naphthalene (C2 and C3) as the higher C-ring compounds become insoluble and are not bioavailable. If invertebrates are contaminated by hydrocarbons, tissue taint can remain for several months, but can eventually be lost. It has been demonstrated that it took 2-5 months for lobsters to lose their taint when exposed to a light hydrocarbon (Yender *et al.* 2002). As condensate is expected to rapidly spread out, a large portion of the coast with the potential to be exposure to hydrocarbons comprises habitats that are suitable for intertidal invertebrates could be exposed, with the potential consequences assessed as Severe (3) based on the potential for localised medium-term impacts to species or habitats of recognised conservation value or to local ecosystem function. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to marine invertebrates to eventuate Marine invertebrates are mostly immobile and likely to be present in the intertidal area of the shorelines within the EMBA. Nevertheless, prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event impacting marine invertebrates is assessed as Rare (1).

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				The risk rating for injury / mortality to marine invertebrates from an accidental release – LOWC during the activity is ranked **Low (3)**.
Natural systems	Saltmarsh	Changes in ecosystem dynamics	Communities of saltmarsh are within the area potentially exposed to hydrocarbons ashore; and is present within some estuaries and inlet/riverine systems. Some of the saltmarsh habitat along this coast will be representative of the Subtropical and Temperate Saltmarsh TEC. Oil can enter saltmarsh systems during the tidal cycles if the estuary/inlet is open to the ocean. Similar to mangroves, this can lead to a patchy distribution of the oil and its effects, because different places within the inlets are at different tidal heights. Oil (in liquid form) will readily adhere to the marshes, coating the stems from tidal height to sediment surface. Heavy oil coating will be restricted to the outer fringe of thick vegetation, although lighter oils can penetrate deeper, to the limit of tidal influence.	Saltmarsh is considered to have a high sensitivity to hydrocarbon exposure. Saltmarsh vegetation offers a large surface area for oil absorption and tends to trap oil. Evidence from case histories and experiments shows that the damage resulting from oiling, and recovery times of oiled marsh vegetation, are very variable. In areas of light to moderate oiling where oil is mainly on perennial vegetation with little penetration of sediment, the shoots of the plants may be killed but recovery can take place from the underground systems. Good recovery commonly occurs within one to two years (IPIECA 1994). Thus, the potential consequence to saltmarshes from exposure are assessed as **Severe (3).** The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to saltmarsh to eventuate Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event impacting saltmarshes is assessed as **Rare (1)**. The risk rating for a change in ecosystem dynamics to salt marshes from an accidental release – LOWC during the activity is ranked **Low (3)**.

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
	Wetlands	Changes in ecosystem dynamics	Five Wetlands of International Importance (RAMSAR) are present within the EMBA. Three wetland communities with TEC status are present within the EMBA; Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community, Coastal swamp sclerophyll forest of NSW and south east QLD, River-flat eucalypt forest on coastal floodplains of southern NSW and east Vic.	The impacts of hydrocarbons on wetlands are generally similar to those described for saltmarshes. The degree of impact of oil on wetland vegetation are variable and complex, and can be both acute and chronic, ranging from short-term disruption of plant functioning to mortality. Spills reaching wetlands during the growing season will have a more severe impact than if oil reaches wetlands during the times when many plant species are dormant. Wetland habitat can be of particular importance for some species of birds and invertebrates. As such, in addition to direct impacts on plants, oil that reaches wetlands also affects these fauna utilising wetlands during their life cycle, especially benthic organisms that reside in the sediments and are a foundation of the food chain. Thus, the potential consequence to wetlands from exposure are assessed as Severe (3) based on the potential for localised medium-term impacts to species or habitats of recognized conservation value or to local ecosystem function. Refer also to: • Marine Invertebrates. • Seabirds and Shorebirds. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5×10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to wetlands to eventuate Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event impacting wetlands is assessed as Rare (1).

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				The risk rating for a change in ecosystem dynamics to wetlands from an accidental release – LOWC during the activity is ranked Low (3).
Human systems	Coastal Settlements	Changes to the functions, interests or activities of other users and aesthetic values	Coastal settlements are within the area potentially exposed to hydrocarbons ashore; however, the stretch of coast expected to be exposed is not densely populated. The duration of shoreline exposure is limited. Most of the hydrocarbons will be concentrated along the high tide mark while the lower/upper parts are often untouched (IPIECA 1995) and expected to be visible.	Visible hydrocarbons have the potential to reduce the visual amenity of the area for coastal settlements. Given its rapid weathering and potential for tidal flushing and rapid degradation, the potential consequence to coastal settlements is assessed as Minor (2) based on the potential for localised short-term impacts. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5×10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to coastal settlements to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event impacting coastal settlements is assessed as Rare (1). The risk rating for a change to the functions, interests or activities of other users and aesthetic values of coastal settlements from an accidental release – LOWC during the activity is ranked Low (2).
	Recreation and Tourism	Changes to the functions, interests or activities of other users and aesthetic values	Recreational and tourism activities occur within the area potentially exposed hydrocarbons ashore; however, the stretch of coast expected to be exposed, as such the volume of recreation/tourism is not as high as other places.	Visible hydrocarbons stranded on a shoreline have the potential to temporarily reduce the visual amenity of the area for tourism and discourage recreational activities. The potential consequence to recreation and tourism is assessed as Minor (2) based on the potential for localised short-term impacts. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5×10^{-4} per well drilled

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to recreation and tourism to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event impacting recreation and tourism is assessed as Rare (1). The risk rating for a change to the functions, interests or activities of other users and aesthetic values of recreation and tourism from an accidental release – LOWC during the activity is ranked Low (2).
	Heritage	Changes to the functions, interests or activities of other users and aesthetic values	Specific locations of spiritual and ceremonial places of significance, or cultural artefacts, are often unknown, but are expected to be present along the mainland coast. Therefore, there is the potential that some of these sites may be within the area potentially exposed to hydrocarbons ashore. Five national heritage places with coastal features are present within the potential monitoring EMBA; Royal National Park and Garawarra State conservation Area, Kamay Botany Bay, Kurnell Peninsula Headland, Bondi Beach and Surf Pavilion, North Head Sydney. Noting that these events will be temporary, so duration of exposure is also limited. Most of the oil will be concentrated along the high tide mark while the lower/upper parts are often	Hydrocarbons stranded on a shoreline have the potential to temporarily reduce the heritage value of the area. However, it is expected that these sites would be above the high tide mark. Direct oiling of heritage places is considered unlikely as hydrocarbons would typically accrue within the upper swash zone. Therefore, the main impact would relate to reduce visual amenity. Thus, given the rapid weathering and potential for tidal flushing and rapid degradation of hydrocarbons, the potential consequence to heritage is assessed as Minor (2) as they could be expected to result in localised short-term impacts. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5×10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to heritage places to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
			untouched (IPIECA 1995) and expected to be visible.	likelihood of a LOWC event impacting heritage sites is assessed as Rare (1). The risk rating for a change to the functions, interests or activities of other users and aesthetic values of heritage sites from an accidental release – LOWC during the activity is ranked Low (2).
	First Nations	Changes to the functions, interests or activities of other users and aesthetic values	First Nations people are intrinsically linked to Sea Country which encompasses lands, waterways, seas, cultural practices and values to which they are connected (AIATSIS 2022). Country is a cultural landscape which includes both tangible values (i.e. cultural heritage sites) and intangible values (i.e. creation stories and cultural practices). First Nations cultural concepts are directly connected with Country. Country describes all aspects of place, environment, spirituality, law and identity. Values of Country differ between First Nations groups, and not all First Nations groups and communities in Australia hold the same belief systems or spirituality. Connection to Sea Country is accompanied by a complexity of cultural rights and responsibilities. Coastal areas traditionally were amongst the most densely populated areas due to the abundance of resources available. Formal recognition of Sea Country rights is significantly slower compared to land rights. This could be for a range of reasons including conflicting perspectives and opinions on	Visible hydrocarbons along a shoreline have the potential to reduce the visual amenity of known heritage sites along the coastline, subsequently potentially impacting the value of the site to First Nations people. An unplanned hydrocarbon spill will impact the waters within Sea Country for a period while the spill disperses and weathers and has the potential to disrupt cultural values of Sea Country. The likelihood of a hydrocarbon spill occurring is assessed as highly unlikely and the actual area that may be affected from any single spill event would be considerably smaller than represented by the EMBA. As condensate is expected to rapidly spread out, a large portion of the coast with the potential to be exposure to hydrocarbons comprises habitats that are suitable for habitats and species could be exposed, with the potential consequences assessed as Severe (3) based on the potential for localised medium-term impacts to species or habitats of recognised cultural heritage value or to local ecosystem function. Nevertheless, hydrocarbons are expected to rapidly weather with the potential for tidal flushing and rapid degradation. Refer also to: • Coastal Habitats • State Marine Parks

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
			traditional custodianship of land and how far it extends (Smyth and Isherwood 2016). Hydrocarbon exposure may have the potential to impact the aesthetic and cultural values of Sea Country by the presence of physical hydrocarbons or the presence of oil spill responders.	The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to First Nations to eventuate Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to a disruption to cultural heritage value and sensitivities is assessed as Rare (1). The risk rating for a disruption to cultural heritage values and sensitivities from an accidental release – LOWC during the activity is ranked Low (3). As such, the intrinsic link between environmental receptors and First Nations people's cultural heritage values and sensitivities is expected to be maintained.

5.9.3.3. In-water Hydrocarbons

Based on the hydrocarbon exposure modelling predictions (RPS, 2022) as summarised in Section 5.9.2.5, in-water hydrocarbons may impact:

- Benthic habitat (e.g. macroalgae, soft coral, and seagrass)
- Plankton
- Marine invertebrates
- Fishes
- Marine reptiles
- Pinnipeds
- Cetaceans (whales and dolphins)
- Commercial and recreational fisheries
- Recreation and tourism
- MPAs
- AMPs
- KEFs
- Wetlands.

Table 5-32 presents the risk assessment for in-water hydrocarbons to these receptors.

Table 5-32: Risk evaluation to ecological receptors within the EMBA – in-water

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
Habitat	Benthic habitats (e.g. macroalgae, soft coral, seagrass)	Change in habitat	Benthic habitats may be present within the area predicted to be exposed above thresholds. Note that the greater wave action and water column mixing within the nearshore environment will also result in rapid weathering of the condensate residue.	Exposure of entrained hydrocarbons to shallow subtidal corals has the potential to result in lethal or sublethal toxic effects, resulting in acute impacts or death at moderate to high exposure thresholds (Shigenaka 2001). Contact with corals may lead to reduced growth rates, tissue decomposition, and poor resistance and mortality of sections of reef (NOAA 2010). Reported toxic responses to oils have included a variety of physiological changes to enzyme systems, photosynthesis, respiration, and nucleic acid synthesis (Lewis & Pryor 2013). A review of field studies conducted after spill events by Connell et al. (1981) indicated a high degree of variability in the level of impact, but in all instances, the macroalgae appeared to be able to recover rapidly from even very heavy oiling. The rapid recovery of algae was attributed to the fact that for most algae, new growth is produced from near the base of the plant while the distal parts (which would be exposed to the oil contamination) are continually lost. Other studies have indicated that kelp beds oiled by crude oil had a 90% recovery within 3-4 years of impact, however full recovery to pre-spill diversity may not occur for long periods after the spill (French- McCay 2004). There is the potential that exposure could result in sub-lethal impacts, more so than lethal impacts, possibly because much of seagrass biomass is underground in their rhizomes (Zieman et al. 1984). However, given the restricted range of exposure (shallow nearshore and intertidal waters only) and the predicted lower concentrations of hydrocarbons that could reach these waters, any impact to benthic habitat is not expected to result in long-term or irreversible damage. Water quality in benthic habitats exposed to entrained hydrocarbons would be expected to return to background conditions within weeks to months of contact. Several

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				studies have indicated that rapid recovery rates may occur even in cases of heavy oiling (National Academies Press 2003). Thus, the potential consequence to benthic habitats is assessed as Minor (2) based on the potential for localised short-term impacts to species/habitats of recognised conservation value, but not affecting local ecosystem functioning. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to benthic habitats to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event impacting benthic habitats is assessed as Rare (1). The risk rating for a Change in habitat of benthic habitats from an accidental release – LOWC during the activity is ranked Low (2).
Marine Fauna	Plankton	Change in fauna behaviour Injury/mortality to fauna	Plankton are likely to be exposed to entrained hydrocarbon. Exposure is predicted in the 0-10 m water depth, which is also where plankton are generally more abundant. Entrained condensate is not shown to intersect the upwelling east of Eden KEF. Therefore, any impact is expected to be extremely localised and temporary.	Phytoplankton are typically not sensitive to oil as they can accumulate rapidly due to their small size and high surface area to volume ratio. Conversely, zooplankton are considered to be more vulnerable to oil(Hook et al. 2016). Water column organisms, such as zooplankton, may be impacted by exposure to hydrocarbons through ingestion, inhalation, and dermal contact (NRDA 2012), which can cause immediate mortality or declines in reproduction (Hook et al. 2016). Lethal and sublethal effects on zooplankton include narcosis, alterations in feeding, development, and reproduction (Almeda et al. 2014). Plankton populations have evolved to respond to environmental perturbations by copious production within short generation times (ITOPF 2011). They are known to have naturally high mortality rates (primarily through predation), however once water quality returns to ambient, plankton populations will return to previous conditions within weeks or months due to recruitment of plankton from surrounding waters.

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				Plankton are numerous and widespread but do act as the basis for the marine food web, meaning that an oil spill in any one location is unlikely to have long-lasting impacts on plankton populations at a regional level. Nevertheless, due to the rapid recovery of plankton populations once water quality conditions re-establish, consequences are assessed as Minor (2) based on the potential for short-term and localised impacts, but not affecting local ecosystem functioning. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to plankton to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to injury / mortality to plankton is assessed as Rare (1). The risk rating for injury / mortality to plankton from an accidental release – LOWC during the activity is ranked Low (2).
	Marine Invertebrates	Change in fauna behaviour Injury/mortality to fauna	The modelling indicates that entrained condensate may be present at 0-10 m water depth. Impact by direct contact of benthic species with hydrocarbon in the deeper areas of the release area is not expected given the surface nature of the spill and the water depths throughout much of the EMBA. Species closer to shore may be affected although these effects	Acute or chronic exposure through contact and/or ingestion can result in toxicological risks. However, the presence of an exoskeleton (e.g. crustaceans) reduces the impact of hydrocarbon absorption through the surface membrane. Invertebrates with no exoskeleton and larval forms may be more prone to impacts. Localised impacts to larval stages may occur which could impact on population recruitment that year. Exposure to microscopic oil droplets may also impact aquatic biota either mechanically (especially filter feeders) or act as a conduit for exposure to semi-soluble hydrocarbons (that might be taken up by the gills or digestive tract) (French-McCay 2009). Toxicity is primarily attributed to water soluble PAHs, specifically the substituted naphthalene (C2 and C3) as the higher C-ring compounds become insoluble and are not bioavailable.

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
			will be localised, low level and temporary. Filter-feeding benthic invertebrates such as sponges, bryozoans, abalone and hydroids may be exposed to sub-lethal impacts, however, population level impacts are considered unlikely. Tissue taint may occur and remain for several months in some species (e.g. lobster, abalone) however, this will be localised and low level with recovery expected. In-water invertebrates of value have been identified to include squid, crustaceans (rock lobster, crabs) and molluscs (scallops, abalone). Several commercial fisheries for marine invertebrates are within the area predicted to be exposed above the impact threshold: Commonwealth fisheries Bass Strait Scallop Central Zone Scallop Fishery State fisheries Victorian Abalone Fishery Victorian Ocean Scallop Fishery	Tainting of recreation or commercial species is considered unlikely to occur, however if it did it is expected to be localised and low level with recovery expected. It has been demonstrated that it took 2-5 months for lobsters to lose their taint when exposed to a light hydrocarbon (Yender *et al.* 2002). As described above, water quality in benthic habitats exposed to entrained hydrocarbons would be expected to return to background conditions within weeks to months of contact. Several studies have indicated that rapid recovery rates may occur even in cases of heavy oiling (National Academies Press 2003). Thus, the potential consequence to invertebrates including commercially fished invertebrates is assessed as Minor (2) based on the potential for short-term and localised impacts, but not affecting local ecosystem functioning. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to marine invertebrates to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to injury / mortality to marine invertebrates is assessed as Rare (1). The risk rating for injury / mortality to marine invertebrates from an accidental release – LOWC during the activity is ranked Low (2).

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
			Victorian Rock Lobster Fishery Victorian Sea Urchin Fishery Tasmanian Giant Crab Fishery Tasmanian Rock Lobster Fishery NSW Abalone Fishery NSW Lobster Fishery NSW Sea Urchin and Turban Shell Fishery	
	Fishes (including sharks and rays)	Change in fauna behaviour Injury/mortality to fauna	Entrained hydrocarbon droplets can physically affect fish exposed for an extended duration (weeks to months). Effects will be greatest in the upper 10 m of the water column and areas close to the spill source where hydrocarbon concentrations are likely to be highest. Several fish communities in these areas are demersal and therefore more prevalent towards the seabed, which modelling does not predict is exposed >10m water depth. Therefore, any impacts are expected to be highly localised. There is a known aggregation, foraging and breeding (nursery area) BIA for the great white shark in the area predicted to be over	Pelagic free-swimming fish and sharks are unlikely to suffer long-term damage from oil spill exposure because dissolved/entrained hydrocarbons in water are not expected to be sufficient to cause harm (ITOPF, 2011). Subsurface hydrocarbons could potentially result in acute exposure to marine biota such as juvenile fish, larvae, and planktonic organisms, although impacts are not expected cause population-level impacts. Many fish species can metabolise toxic hydrocarbons, which reduces the risk of bioaccumulation of contaminants in the food web (and human exposure to contaminants through the consumption of seafood) (NRDA 2012). Furthermore, many fishes are mobile without site fidelity. Highly mobile species are unlikely to remain within the area long enough to be exposed to hydrocarbons to experience sub-lethal impacts (ITOPF 2011). A study by Claireaux *et al.* (2017) revealed seabass detect and avoid in-water dissolved hydrocarbons at concentrations of 3 to 15 ppb. Based on this study, it is expected that pelagic fishes can detect and avoid in-water hydrocarbons at concentrations below levels that would lead to chronic effects. Large scale fish kills have rarely been observed as a result of hydrocarbon spills (ITOPF 2011) (though mortality in aquaculture pens has been reported), which is likely to be because vertebrates can rapidly metabolise and excrete hydrocarbons (Hook *et al.* 2016).

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
			the impact threshold, however, it is not expected that this species spends a large amount of time close to the surface where thresholds are predicted to be exceeded.	Fish are most vulnerable to hydrocarbons during their embryonic, larval and juvenile life stages. Impacts on fish eggs and larvae entrained in the upper water column are not expected to be significant given the temporary period of water quality impairment, and the limited areal extent of the spill. As egg/larvae dispersal is widely distributed in the upper layers of the water column it is expected that current induced drift will rapidly replace any oil affected populations. The Recovery Plan for the white shark identifies habitat degradation (pollution) as a threat (CoA, 2013). The hydrocarbon EMBA (moderate exposure) for LOWC does not contain critical habitats or feeding aggregation areas for white and whale sharks. The presence of white and whale sharks within the EMBA is therefore expected to be limited to transitory individuals that will not be subject to long-term hydrocarbon exposure. In the event of a LOWC event, fishes in the hydrocarbon EMBA (moderate exposure) for LOWC are susceptible to injury / mortality from exposure to hydrocarbons. The absence of habitat features or conditions for site-attached fishes in the hydrocarbon EMBA (moderate exposure) for LOWC limits potential risk to fishes from dry gas exposure to transient individuals. Transient fish species are highly mobile and as such are not likely to suffer extended exposure to hydrocarbons (ITOPF 2011). Environmental monitoring of pelagic and demersal fishes immediately following the Montara oil spill indicated that fish were exposed to hydrocarbons, although no adverse effects were detected (Gagnon and Rawson 2012, 2011). Further sampling and testing over time indicated that fish captured in close proximity to the Montara wellhead were comparable to those collected from reference sites (Gagnon and Rawson 2012, 2011). Thus, the potential consequence to fish and sharks including commercially fished species is assessed as Major (4) based on the potential for localised short-

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				term impacts to species/habitats of recognised conservation value, but not affecting local ecosystem functioning. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to fish to eventuate. Given the mobile nature of most fish species, the potential for exposure to hydrocarbons at a level that would cause sub-lethal or lethal impacts is low. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to injury / mortality to fishes is assessed as Rare (1). The risk rating for injury / mortality to fishes from an accidental release – LOWC during the activity is ranked Medium (4).
	Marine Reptiles (including marine turtles)	Change in fauna behaviour Injury/mortality to fauna	No BIAs, nesting, internesting areas or habitat critical to the survival of the species were identified for marine turtles in the hydrocarbon EMBA (moderate exposure) for LOWC. Loggerhead, green, leatherback and hawksbill turtles may occur within the hydrocarbon EMBA (moderate exposure) for LOWC. Only a small proportion of any marine reptile population is expected to be exposed to this EMBA.	Some individual marine reptiles may come into contact with in-water hydrocarbon exposure while swimming or feeding. Light oils, such as unweathered condensate, expose marine reptiles to volatile PAHs which may result in breathing, sight, or gastro-intestinal injuries (CoA 2017a). These injuries to marine reptiles can result in decreased health, starvation, increased stranding, and decreased breeding condition (CoA 2017a). Impacts to marine reptiles from LOWC surface hydrocarbon exposure is expected to be widespread and temporary based on weathering properties of dry gas. Records of oiled wildlife during spills rarely include marine turtles, even from areas where they are known to be relatively abundant (Short 2011). An exception to this was the large number of marine turtles collected (613 dead and 536 live) during the Macondo spill in the Gulf of Mexico, although many of these animals did not show any sign of oil exposure (NOAA 2013). Of the dead turtles found, 3.4% were visibly oiled and 85% of the live turtles found

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				were oiled (NOAA 2013). Of the captured animals, 88% were later released, suggesting that oiling does not inevitably lead to mortality. No habitat critical to the survival of the species have been identified in the area, and no BIA has been designated in the region of the EMBA. The number of marine turtles that may be exposed to condensate is expected to be low due to their limited and transient presence in the area. Therefore, no long-term effects are expected although impacts leading to death to individual EPBC Act listed marine reptiles may occur (albeit unlikely). Therefore, impacts are assessed as Major (4). The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to marine reptiles to eventuate. As described above, there are no critical habitat or BIAs for marine turtles within the EMBA, limiting the potential for a spatial and temporal overlap of marine turtles with the surface hydrocarbons from an LOWC event. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to injury / mortality to marine reptiles is assessed as Rare (1). The risk rating for injury / mortality to marine reptiles from an accidental release – LOWC during the activity is ranked Medium (4).
Pinnipeds (seals and sea-lions)	Change in fauna behaviour Injury/mortality to fauna	There are two species of pinnipeds Australian Fur-seal and the Long-nosed Fur-seal that may occur in the area predicted to be exposed to entrained hydrocarbons above thresholds. (Section 4.6.4.20).	Pinnipeds are sensitive to in-water hydrocarbon exposure as they will stay near established colonies and haul-out areas, meaning they are less likely to practice avoidance behaviours. This is corroborated by Geraci and St. Aubins (1988) who suggest seals, sea- lions and fur-seals have been observed swimming in oil slicks during a number of documented spills. Exposure to low/moderate effects level hydrocarbons in the water column or consumption of prey affected by the oil may cause sub-lethal impacts to	

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				pinnipeds. However, given the temporary and localised nature of the spill, their widespread nature, the low-level exposure zones and rapid loss of the volatile components of condensate in choppy and windy seas (such as that of the EMBA), the potential consequence is assessed as Severe (3) based on the potential for localised short-term impacts to species/habitats of recognised conservation value, but not affecting local ecosystem functioning. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10-4 per well drilled for Offshore Operations of North Sea Standard (IOGP 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to pinnipeds to eventuate. Impacts to pinnipeds at a population level are considered very unlikely given their transient, highly mobile nature and their typically extensive foraging grounds. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to injury / mortality to pinnipeds is assessed as Rare (1). The risk rating for injury / mortality to pinnipeds from an accidental release – LOWC during the activity is ranked Low (3).
	Cetaceans	Change in fauna behaviour Injury/mortality to fauna	Several threatened, migratory and/or listed marine cetacean species have the potential to be migrating, resting or foraging within an area predicted to be exposed to in-water hydrocarbons. The following BIAs are within the area predicted to be exposed to entrained hydrocarbons above thresholds.: Pygmy Blue Whale foraging BIA	In an LOWC event, marine mammals are more likely to be exposed to volatile hydrocarbon fumes from ingestion or inhalation. Physical oiling of marine mammals from condensate is unlikely. The absence of hairs and the frequent sloughing of skin cells provide little opportunity for hydrocarbons to adhere to cetacean bodies (Helm et al. 2015). Cetaceans do not drink large volumes of sea water and would not ingest much hydrocarbons, their foraging strategies likely do not include scavenging on oil-killed prey, and the toxic volatile components of condensate can dissipate quickly so exposure to toxins through inhalation may be minimal (Helm et al., 2015).

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
			Southern Right Whale migration and breeding BIA Humpback Whale foraging and migration BIAs Indo-Pacific Spotted Bottlenose Dolphin breeding BIA	Effects of hydrocarbon ingestion may lead to hypothermia, organ dysfunction, congested lungs, damaged airways, emphysema, gastrointestinal ulceration and haemorrhaging, eye and skin lesions, and decreased body mass due to restricted diet (AMSA, 2022). Such impacts are associated with 'fresh' hydrocarbon; the risk of impact declines rapidly as the condensate weathers. Specifically, toothed whales and dolphins may be susceptible to ingestion of dissolved and entrained oil as they gulp feed at depth. There are reports of declines in the health of individual pods of killer whales (a toothed whale species), though not the population as a whole, in Prince William Sound after the Exxon Valdez vessel spill (heavy oil) (Hook et al., 2016). The potential for population impacts to marine mammals following a LOWC event would need to coincide with a migration event to result in exposure of many individuals. Southern right whales and pygmy blue whales are pelagic (move freely in the oceans) and given the mobility and wide geographical distribution of marine mammals, only transient marine mammal individuals would be expected to be exposed to hydrocarbons, resulting in short-term consequences, with no long-term population viability effects (Helm et al. 2015). A proportion of the migrating population of whales could be affected for a single migration event, thus potential consequence is assessed as Major (4) based on the potential for localised short-term impacts to species/habitats of recognised conservation value, but not affecting local ecosystem functioning. The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5×10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP, 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to cetaceans to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to injury / mortality to marine mammals is assessed as Rare (1).

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				The risk rating for injury / mortality to marine mammals from an accidental release – LOWC during the activity is ranked Medium (4).
Natural systems	KEFS	Changes in ecosystem dynamics	Big Horseshoe Canyon, Canyons on the eastern continental slope, Seamounts South and east of Tasmania, Shelf rocky Reefs, Tasman Front and eddy field, and Tasmania seamount Chain are predicted to be exposed to entrained hydrocarbons above thresholds. Values associated with these include: • High productivity and aggregation of marine life due to their ability to influence currents, creating localised upwelling and turbulent mixing • Hard substrates provide attachment points for sessile invertebrates in an	The values identified within these KEFs have the potential to be exposed to entrained hydrocarbons at, or above, the low threshold. However, the exposure of entrained hydrocarbons will be greatest within the upper 0-10 m of the water column and areas close to the spill source. Therefore, the spill is unlikely to intersect with majority of the values of the KEFs which are concentrated within the water column >10 m deep and along the seafloor at varying water depths. Hydrocarbon exposure to the key biological receptors associated with KEFs (e.g. seabirds, pinnipeds and cetaceans) may cause a subsequent negative impact to the value of the KEFs, however is expected to be limited to a small number of individuals, with no impacts to regional populations. Based on the worse case potential impact to key receptors within these KEFs, the potential consequence is assessed to be Major (4). The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5×10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP, 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to KEFs to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to injury / mortality to the values of the impacted KEF is assessed as Rare (1). The risk rating for a change in ecosystem dynamics to KEFs from an accidental release – LOWC during the activity is ranked Medium (4). Refer also to: • Coral • Macroalgae

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
			otherwise relatively featureless environment • Support a diverse range of benthic, demersal and pelagic species as well as a high degree of endemism	• Seagrass • Plankton • Invertebrates • Seabirds • Fish and Sharks • Marine mammals (Pinnipeds, Cetaceans).
	State Marine Protected Areas	Changes in ecosystem dynamics	Marine protected areas predicted to be exposed to entrained hydrocarbons above thresholds: Commonwealth Australian Marine Parks: Beagle and East Gippsland State Marine National Parks: Point Hicks Marine Parks: Batemans, Jervis Bay Marine Sanctuary: Beware Reef Conservation values for these areas include high marine fauna and flora diversity, including fish and invertebrate assemblages and	Ecological values within these State Protected Areas may be exposed to entrained hydrocarbons at or above moderate thresholds in the event of a spill. Such exposure, whether direct (e.g., contact or ingestion) or indirect (e.g., food chain transfer), could result in localised adverse effects on sensitive species and habitats, potentially diminishing the ecological integrity of the State Protected Areas. Based on the worse case potential impact to key receptors the consequence to protected marine areas is assessed Major (4). The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5×10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP, 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to State Marine Protected Areas to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to injury / mortality to

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
			benthic coverage (sponges, soft corals, macroalgae).	the values of the impacted State marine protected area is assessed as Rare (1). The risk rating for a change in ecosystem dynamics to the State marine protected area from an accidental release – LOWC during the activity is ranked Medium (4). Refer to: • Invertebrates. • Macroalgae. • Marine mammals (Pinnipeds, Cetaceans).
Human systems	Commercial fishing	Changes to the functions, interests or activities of other users and aesthetic values	In-water exposure to entrained condensate may result in a reduction in commercially targeted marine species, resulting in impacts to commercial fishing and aquaculture. Actual or potential contamination of seafood can affect commercial and recreational fishing and can impact seafood markets long after any actual risk to seafood from a spill has subsided (NOAA 2002) which can have economic impacts to the industry. Several commercial and state fisheries operate in the EMBA and overlap the spatial extent of the water column hydrocarbon predictions.	Commercial fishing has the potential to be impacted through exclusion zones associated with the hydrocarbon release, the release response and subsequent reduction in fishing effort. Exclusion zones may impede access to commercial fishing areas, for a short period of time. The precautionary exclusion from fishing grounds can be expected until water quality monitoring verifies the absence of residual hydrocarbons, as such providing confidence to consumers in fisheries tainting. Fishing areas may be closed for fishing for as short period (days) because of the risks of the catch being tainted by hydrocarbons. Any exclusion zone established would be limited to the immediate vicinity of the release point, and due to the rapid weathering of condensate would only be in place 1-3 days after release, therefore physical displacement to vessels is unlikely to be a significant impact. Concentrations of petroleum contaminants in fish and crustacean and mollusc tissues pose adverse human health effects, and until these products cleared by the health authorities, they could be restricted for sale and human consumption. Any acute impacts are expected to be limited to small numbers of juvenile fish, larvae, and planktonic organisms, which are not

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION

expected to affect population viability or recruitment. Impacts from entrained exposure are unlikely to manifest at a fish population viability level.

Studies of laboratory trials or of fish collected after release events (including the Hebei Spirit, Macondo, Sea Empress, Montara spills) found evidence of elimination of PAHs in fish tissues returning to reference levels within two months of exposure (Challenger and Mauseth, 2011; Davis et al., 2002; Gagnon & Rawson, 2011; Gohlke et al., 2011; Jung, 2011; Law, 1997; Rawson et al., 2011).

Actual or potential contamination of seafood can affect commercial and recreational fishing and can impact seafood markets long after any actual risk to seafood from a spill has subsided (NOAA, 2002) which can have economic impacts to the industry.

The potential consequence to commercial and recreational fisheries is assessed as Major (4) based on changes to the functions, interests or activities of commercial fisheries will be widespread, with no long-term consequences.

The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5×10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP, 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to commercial fisheries to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to change to the functions, interests, or activities to commercial fisheries is assessed as Rare (1).

The risk rating for change to the functions, interests, or activities to commercial fisheries from an accidental release – LOWC during the activity is ranked Medium (4).

Refer also to:

- Fish and Sharks

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
				• Invertebrates.
	Recreation and tourism	Changes to the functions, interests or activities of other users and aesthetic values	In-water exposure to entrained condensate may result in a negative impact to recreation and tourism activities.	Any impact to receptors that provide nature-based tourism features (e.g. whales) may cause a subsequent negative impact to recreation and tourism activities. However, the relatively short duration, and distance from shore means there may be short-term and localised consequences, which are ranked as Minor (2). The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP, 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to recreation and tourism to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to change to the functions, interests, or activities to recreation and tourism is assessed as Rare (1). The risk rating for change to the functions, interests, or activities to recreation and tourism from an accidental release – LOWC during the activity is ranked Medium (4). Refer also to: • Fish and Sharks • Cetaceans • Invertebrates • Recreational Fishing
	First Nations	Changes to the functions, interests or activities of other users	First Nations people are intrinsically linked to Sea Country which encompasses lands, waterways, seas, cultural practices and values to which they are	First Nations people connection to Sea Country could potentially be impacted by exposure to hydrocarbons. See Section 4.9.6 for further details of the values.

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
		and aesthetic values	connected (AIATSIS 2022). Country is a cultural landscape which includes both tangible values (i.e. cultural heritage sites) and intangible values (i.e. creation stories and cultural practices). First Nations cultural concepts are directly connected with Country. Country describes all aspects of place, environment, spirituality, law and identity. Values of Country differ between First Nations groups, and not all First Nations groups and communities in Australia hold the same belief systems or spirituality. Connection to Sea Country is accompanied by a complexity of cultural rights and responsibilities. Coastal areas traditionally were amongst the most densely populated areas due to the abundance of resources available. Formal recognition of Sea Country rights is significantly slower compared to land rights. This could be for a range of reasons including conflicting perspectives and opinions on traditional custodianship of land	In-water exposure at relevant thresholds may impact culturally important significant coastal habitats such as mangroves, and species to First Nations peoples, such as cetaceans, marine reptiles, and fish. First Nations people maintain cultural obligations and kinship responsibilities to care for culturally significant species and their habitats within Sea Country, including areas designated as marine protected areas. Any impact to species populations could disrupt these obligations and cultural practices. While the 10 ppb low entrained hydrocarbon exposure threshold—used to define the extent of the EMBA—represents the lowest concentration aligned with chronic exposure trigger levels in water quality guidelines, ecological impacts at this threshold are considered highly unlikely. Consequently, long-term impacts to First Nations cultural activities from contact at this threshold are not anticipated. Furthermore, the spill scenario is expected to be localised and short-term, with condensate rapidly weathering within days. Based on the worst-case potential impact to key environmental receptors within marine protected areas, which may indirectly affect First Nations cultural heritage values, the consequence rating for protected marine areas is assessed as Major (4), consistent with the adopted risk assessment methodology. Refer also to: • Benthic habitats and Communities • Marine Invertebrates • Mangroves • Cetaceans • Marine Reptiles • Seabirds and Shorebirds • State Marine Parks • Commonwealth Marine Parks

RECEPTOR GROUP	RECEPTOR TYPE	IMPACTS	EXPOSURE EVALUATION	RISK EVALUATION
			and how far it extends (Smyth and Isherwood 2016). An unplanned hydrocarbon spill will impact the waters within Sea Country for a period while the spill disperses and weathers and has the potential to disrupt cultural values of Sea Country. The likelihood of a hydrocarbon spill occurring is assessed as highly unlikely and the actual area that may be affected from any single spill event would be considerably smaller than represented by the EMBA. Hydrocarbon exposure may have the potential to impact the aesthetic and cultural values of Sea Country by the presence of physical hydrocarbons or the presence of oil spill responders.	The historical frequency of LOWC incidents while drilling normal deep appraisal wells has been reported at 1.5 x 10^{-4} per well drilled for Offshore Operations of North Sea Standard (IOGP, 2019). This represents the frequency of the cause (i.e. a LOWC); additional environmental factors would be necessary for the worst-case consequences to First Nations to eventuate. Prevention controls are in place to prevent the risk of a LOWC event. The likelihood of a LOWC event leading to a disruption in cultural heritage values and sensitivities is assessed as Rare (1). The risk rating for a change in ecosystem dynamics leading to a disruption in cultural values and sensitivities from an accidental release – LOWC during the activity is ranked Medium (4). As such, the intrinsic link between environmental receptors and First Nations people's cultural heritage values and sensitivities is expected to be maintained.

5.9.4. ALARP Demonstration

Drilling activities have been undertaken in the Gippsland Basin hydrocarbon province with no LOWC incident recorded to date. Drilling activities are highly regulated with associated control measures, well understood, and are implemented across the offshore industry.

There were no objections from stakeholders regarding the risk of a LOWC event from this activity.

However, a LOWC incident would likely attract public and media interest. Spill modelling has been undertaken to inform the environmental risk assessment for a LOWC, which indicates that only a small volume of gas condensate at the actionable/recoverable threshold (100 g/m^2) would be likely to accumulate on the Victorian shoreline (28 m^3), while the area of sea there is a large degree of uncertainty regarding the risks from a LOWC incident. Consequently, Emperor Energy believes that ALARP Decision Context B should be applied.

Response strategies for use during a hydrocarbon release are described in Chapter 6. In the event of a LOWC, the critical path will be securing a suitable rig and necessary approvals to drill a relief well.

Emperor Energy and AGR assessed the timeframe that could be implemented to reduce the drilling of a relief well within the broadly acceptable industry standard of 77 days. A description of the assessed timeframes for relief well drilling is provided in Section 6.2.1, which estimates that a relief well would be completed (from LOWC event to well kill) in 67 days, based on implementing additional engineering and administrative controls such as ensuring the provision of relevant relief well supplies (a back-up well head and casing) and adopting parallel relief MODU mobilisation and safety case revision processes. This is less than the 77 days LOWC modelled by RPS to support the impact assessment, therefore the description of impacts and risks including throughout this section is considered to be a conservative environmental impact assessment for an unplanned released of condensate from a LOWC.

5.9.5. Adopted Control Measures

ALARP Decision context Type B highlights additional controls may be required to ensure impacts can be managed to an acceptable level.

Table 5-33 lists the adopted preventative and response controls to be used during the activity to prevent and respond to a LOWC event.

Table 5-33: Adopted Control Measures: Accidental Release – Loss of Well Control

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
PREVENTATIVE	
CM29: NOPSEMA-accepted WOMP (Drilling only)	Under Part 5 of the Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2025, NOPSEMA is required to accept a WOMP to enable well activities to be undertaken. The WOMP describes well barriers and the integrity testing that will be in place for the program that are designed to prevent a LOWC. Emperor Energy's NOPSEMA-accepted WOMP will describe the minimum requirements for well barriers during drilling activities. The preparation of a WOMP ensures compliance with regulations and is industry best practice.

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
CM26: NOPSEMA-accepted MODU Safety Case Revision (SCR) (Drilling only)	The Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2024 (OPGGS(S)) set out the requirements for the contents of Safety Cases and SCRs. The MODU requires an Australian Safety Case detailing the controls in place to prevent a major accident event. The MODU Safety Case: • identifies the hazards and risks • describes how the risks are controlled • describes the safety management system in place to ensure the controls are effectively and consistently applied. The preparation of a SCR ensures compliance with regulations and is industry best practice to manage safety risk to personnel and the MODU. Emperor Energy will only contract a MODU with a NOPSEMA accepted SCR in place.
CM30: Preventative Maintenance System – BOP testing (Drilling only)	BOP is routinely function and pressure tested in accordance with manufacturer's specifications and in alignment with the Drilling Contractor's PMS. This testing ensures the BOP is functional and can be activated to prevent a LOWC and associated environmental impacts.
CM40: BOP – Functional Tests (Drilling only)	The BOP will be function tested as per the schedule outlined in the NOPSEMA-accepted WOMP during the campaign. This testing ensures the BOP is functional and can be activated to prevent a LOWC and associated environmental impacts.
RESPONSIVE	
CM27: NOPSEMA-accepted OPEP (All activities)	Under the OPGGS(E) Regulations, NOPSEMA requires that the petroleum activity has an accepted OPEP in place before the activity commences. In the event of a LOWC, the EPS presented in Appendix G of the OPEP will be implemented (those EPS are not repeated here). The OPEP outlines the project-specific spill scenario response strategies that can be deployed in the event of a spill, including source control, to effectively mitigate and limit impacts to the environment from LOWC. The OPEP demonstrates the contracts and resources in place to enable Emperor Energy to quickly implement a tailored response.
CM39: Source Control Emergency Response Plan (SCERP) (Drilling only)	A SCERP shall be developed consistent with industry best practice and aligned with International Oil and Gas Producers (IOGP) Report 594 - Subsea Well Source Control Emergency Response Planning Guide for Subsea Wells (September 2025) and NOPSEMA IP1979 - Source control planning and procedures; as relevant to the Judith-2 well design (noting it is not a subsea well). The SCERP is the response procedure used to pre-emptively plan the source control activities, in significant detail, to respond to a LOWC event so as to limit impacts to the environment from a LOWC. The SCERP will include details on:

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
	• Emergency response structure • WCD & gas plume analysis • Casing design for WCD & displacement to hydrocarbon • Well integrity & source control selection • Structural integrity analysis • Relief well locations, well design and dynamic kill plan • Back-up equipment, casing for drilling relief well • Alternate MODU and Mutual Aid Agreements • Regulatory approval pathways • Logistics planning • Project schedule. The SCERP details how Emperor Energy will conduct a well kill successfully, within 67 days as per the ALARP Relief Well drilling timeline estimate.
	At a minimum of 3 months prior to drilling activities, contracts and MoUs will be in place for source control personnel (including but not limited to Wild Well Control).
CM28: Operational & Scientific Monitoring Bridging Implementation Plan (OSM-BIP) (All activities)	Operational and scientific monitoring will be implemented in accordance with the OSM-BIP. The OSM-BIP outlines the OSM response in detail to be implemented to effectively monitor environmental impacts resulting from a LOWC and provide intelligence on the success of spill response activities and guide future response measures.
CM44: AMOSC membership (All activities)	Emperor Energy will have in place associate membership with AMOSC prior to commencing the activity, which remains in force for the duration of the activity. The benefit of this control measure is that it ensures Emperor Energy will have access to spill response equipment, specialist contractors and AMOSC and Core Group members (over 120 trained responders from within the petroleum sector) who are highly trained in incident control and command and spill response techniques. Associate membership with AMOSC is common for junior and mid-cap explorers who do necessarily require the full membership that titleholders with producing assets maintain.
CM43: Reporting and Recording (All activities)	All environmental near-misses and incidents as defined in Section 8.7, including non-compliance with the EP and OPEP EPOs and EPSs, will be communicated immediately to AGR's HSE Manager, who will report to the Emperor Energy COO. All recordable and reportable incidents are communicated to the relevant external authority in line with reporting time frames detailed in Table 8-6.

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
	Reporting of all incidents and near-misses allows for incident investigation to be undertaken and corrective actions to be put in place to prevent a LOWC event from occurring.

Table: 5-34 identifies additional control measures and considers each against the principle of gross disproportionality between the sacrifice (cost, time, effort) of implementation and the reduction in risk or impact and environmental benefit.

Table: 5-34: Additional Control Measures Considered

CONTROL	COST / BENEFIT ANALYSIS	CONTROL IMPLEMENTED
PREVENTATIVE		
Do not undertake the Judith-2 drilling activities	Not drilling eliminated the potential for a LOWC event. However, this is not feasible because drilling is required to meet the petroleum title commitments.	No
Undertake activity at a different time of year to reduce potential exposure of marine mammals to hydrocarbons	Pygmy blue whales are potentially in the foraging BIA within Operational Area waters from November through to June. Southern right whales may travel through the Operational Area to and from coastal aggregation and migration areas during May-June and September-November. It is therefore safe to assume there is no period when there is not a whale undertaking a biologically important behaviour within the Operational Area and as such, the activity cannot be timed to avoid the presence of whales. The implementation of CM13 and CM14, which go above and beyond the legislative requirements of the EPBC Regulations 2000 – Part 8 Division 8.1 (interacting with cetaceans) will be implemented and are sufficient to manage potential impacts to whales undertaking biologically important behaviour.	No
PREPAREDNESS		
Source control support through the AEP MoU arrangement (Drilling only)	Emperor Energy is a signatory to AEP Mutual Aid MoU that provides access to emergency equipment including a MODU to drill a relief well in the event of a LOWC. In addition to this, Emperor Energy has access (via AGR) to a list of rigs available in Australia and southeast Asia that would be suitable to drill a relief well in the event of a LOWC. Access to a suitable drilling rig is critical in limiting the volume of the spill by securing a rig sooner than may otherwise be possible and killing the well in the shortest	Yes (CM39)

CONTROL	COST / BENEFIT ANALYSIS	CONTROL IMPLEMENTED
	possible time, thereby reducing the duration of the release and limiting the impact on the environment. As such, the benefit of being a signatory to the AEP Mutual Aid MoU outweighs the cost involved.	
Relief Well Critical Equipment Availability and Supply Chain Readiness (Drilling only)	Emperor Energy maintains a backup wellhead system and 30" conductor string, ensuring that these long lead components are immediately available if a relief well is required. Additional 13⅜", 9⅝" and 7" casing/liner strings, while not pre-purchased, are routinely stocked by established regional suppliers and can be sourced within short timeframes. Having access to such equipment means that relief well drilling can occur promptly, therefore minimising the spill volume into the marine environment. Supply chain assessments confirm that procurement lead times for these casing sizes are not on the critical path for relief well initiation. The primary determinants of relief well duration are rig mobilisation, well design, geotechnical conditions and drilling execution, rather than casing availability.	Yes (CM45)
Capping stack	Installing a capping stack can reduce the duration of a well blowout for subsea wells. The design of the Judith-2 well program using a JUR and a surface BOP system (i.e., not a subsea well) does not allow for the use of a subsea capping stack in the event of a LOWC event. As such, this is not a feasible option.	No
Standby drilling rig to undertake a relief well whilst exploration activities are undertaken.	Having a drilling rig on standby may reduce the time the relief well is drilled by 34 days compared to the AEP MoU (the relief well design, outlined in Section 6.2.1, has allowed 30 days for a relief well drilling rig to arrive on location). This expedites commencement of relief well drilling, therefore reducing the volume of hydrocarbons released to the marine environment in the event of a LOWC. The additional cost for a standby drilling rig is substantial (approximately $1 million per day) and would require an in-force Safety Case/SCR, which could add several hundred thousand dollars to this control measure. Without a pipeline of drilling projects to work on in Australia after remaining on standby for the Judith-2 drilling campaign, a drilling rig contractor is highly unlikely to mobilise to Australia due to the very high costs of mobilising to and demobilising from Australia.	No

CONTROL	COST / BENEFIT ANALYSIS	CONTROL IMPLEMENTED
	With the other prevention and response control measures in place, the significant costs of this control measures are considered grossly disproportionate to the low risk of a LOWC.	
Pre-drill relief well top hole to reduce the relief well drilling time	This action may reduce the overall time to drill the relief well by 1-2 days, therefore reducing the volume of hydrocarbons released into the marine environment. Pre-drilling a top hole section will incur significant costs (several million dollars, primarily related to rig time) and result in additional drill cuttings and fluids discharges. The high costs and additional environmental impacts of pre-drilling a relief well top hole section are therefore considered grossly disproportionate to the very low likelihood of a LOWC occurring and the limited reduction in time it would take to drill a relief well.	No
RESPONSE		
Subsea dispersant	Subsea dispersant delivery at the well site reduces concentrations of volatile organic compounds (VOC) that reach surface. However, chemical dispersants are considered ineffective for gas-condensate hydrocarbon releases. The design of the Judith-2 well program using a JUR and a surface BOP system removes the capability for injection of subsea dispersant into a subsea wellhead, as any release from a LOWC will be at surface.	No

5.9.6. Acceptability Determination

Potential impacts from accidental release – loss of well control are considered acceptable based on meeting the acceptability criteria as defined in Section 2.7. Table 5-35 details the evaluation of the potential impacts against each acceptability criterion.

Table 5-35: Acceptability determination

CRITERIA	DETERMINATION
To meet the principles of ESD	Based upon the risk assessment completed for this activity, potential risks from a LOWC event are assessed to have a residual risk ranking of Medium (4). This residual risk ranking is considered tolerable and has been demonstrated ALARP. Quantitative modelling has been undertaken to remove some of the scientific uncertainty associated with this aspect. As such, the activity is consistent with the principles of ESD.

CRITERIA	DETERMINATION
Internal context	The proposed management of the impact is aligned with the Emperor Energy HSE Policy (APPENDIX A). Activities will be undertaken in accordance with the Implementation Strategy (Section 8).
External context	No objections or claims have been raised during stakeholder consultation regarding the potential for a LOWC event.
Other requirements	A LOWC event is to be managed in consideration with: • MO 91: Marine Pollution Prevention – Oil • OPGGS(E) Regulations. The management of a LOWC event was not deemed to be inconsistent with relevant plans, conservation advice or recovery plans listed in Section 4.6.6 Commonwealth Requirements Table 1 2 including: • South-east Marine Parks Network Management Plan 2025 (DNP, 2025) • National Recovery Plan for Marine Turtles in Australia (CoA, 2017a) • National Recovery Plan for white shark (CoA, 2013) • Conservation Management Plan for the Blue Whale (CoA, 2015a) • Conservation Advice for *Balaenoptera physalus* (fin whale) (TSSC, 2015b) • Conservation Advice for *Balaenoptera borealis* (sei whale) (TSSC, 2015c) • National Recovery Plan for the Australian Fairy Tern (Sternula nereis nereis) (CoA, 2020e) • National Recovery Plan for the Australian Painted Snipe (CoA 2022a) • Conservation Advice Calidris ferruginea (curlew sandpiper) (DoE, 2015a) • Conservation Advice for Calidris acuminata (sharp-tailed sandpiper) (DCCEEW, 2024d) • Conservation Advice for Numenius madagascariensis (far eastern curlew) (DCCEEW, 2023c) • Conservation Advice for Calidris tenuirostris (great knot) (DCCEEW, 2024e) • Conservation Advice for Calidris canutus (red knot) (DCCEEW, 2024f) • National Recovery Plan for Albatrosses and Petrels 2022 (CoA, 2022) • Wildlife Conservation Plan for Migratory Shorebirds – 2015 (DoE, 2015a) • Wildlife Conservation Plan for Seabirds (CoA, 2020c) Relevant legislative requirements that provide explicit actions against this aspect are detailed below. Relevant conservation advice or management plans that identify pollution as a threat but do not provide explicit requirements are not detailed below.

CRITERIA	DETERMINATION
	Emperor Energy considers the adopted control measures as detailed in Section 5.9.5 will manage the potential impacts from this aspect to ALARP and acceptable levels.

Requirement	Demonstration
Recovery Plan for Marine Turtles in Australia (CoA, 2017a) Management action A4.2: Ensure spill risk strategies and response programs adequately include management for marine turtles and their habitats, particularly in reference to 'slow to recover habitats', e.g. nesting habitat, seagrass meadows or coral reefs	Assessment of spill risk strategies and response is within the scope of CM27: NOPSEMA accepted Oil Pollution Emergency Plan (OPEP). Response and recovery of habitats and marine fauna is within the scope of CM28: Operational & Scientific Monitoring Bridging Implementation Plan (OSM-BIP). Having met these requirements, the activity is considered to be not inconsistent with the Recovery Plan for Marine Turtles in Australia.
National Recovery Plan for the Australian Fairy Tern (*Sternula nereis nereis*) (CoA, 2020e) Ensure appropriate oil-spill contingency plans are in place for the subspecies' breeding sites which are vulnerable to oil spills.	Assessment of spill risk strategies and response is within the scope of CM27: NOPSEMA accepted Oil Pollution Emergency Plan (OPEP). Response and recovery of habitats and marine fauna is within the scope of CM28: Operational & Scientific Monitoring Bridging Implementation Plan (OSM-BIP) Having met these requirements, the activity is considered to be not inconsistent with the Recovery Plan for Fairy Tern in Australia.

Acceptability outcome	Potential impacts from LOWC event are considered **Acceptable** having met all the acceptability criteria as detailed above. Implementing the adopted control measures listed in Section 5.9.5 will ensure the following EPOs will be met: **EPO7:** No unplanned release of hydrocarbons to the marine environment. **EPO12:** Undertake oil spill response in a manner that will not result in additional impacts to marine environment, coastal habitat and oiled wildlife. By meeting the above EPOs, it will ensure potential risks will be at or below the defined acceptable levels.

5.10. Environmental Performance Outcomes, Performance Standards and Measurement Criteria

In accordance with the OPGGS(E)R, the EP must set EPOs for the activity to reflect level of environmental performance of the titleholder in protecting

the environment. In addition, the EP must set EPSs for the adopted control measures identified in the impact and risk assessment (Sections 5) and include measurement criteria that the titleholder will use to define how environmental performance will be measured.

Table 5-36 details the control measures, EPOs, EPSs and measurement criteria relevant to the Program Activities. Notes accompany each control measures to define whether it applies to all activities (geophysical survey, geotechnical survey and drilling), both the geophysical survey and the geotechnical survey, or just one of the surveys.

It is noted that in addition to EPO8 and EPO9, all of the EPOs listed in Table 5-36 are relevant to First Nations cultural values and sensitivities given the protection of the environment and all relevant receptors is equivalent to the cultural obligation for the protection of Country as defined in Section 4.9.6.

Table 5-36: EPO, EPS and MC

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
EPO1: Marine users are not excluded from areas other than those defined for safe operations of which agreed notifications will be issued.	**CM01**: Ongoing consultation (All activities)	**EPS1.1:** Consultation will be undertaken in accordance with EP Chapter 7, including notifications for on-water activities (pre-start and cessation notification requirements) and ongoing consultation.	**MC1.1.1:** Consultation records are available in Emperor Energy's consultation software, as required by EP Chapter 7.
		EPS1.2: Specific notifications will be provided in accordance with ongoing consultation requirements and timings as detailed in EP Table 7-4.	**MC1.2.1:** Records of ongoing notifications are available in Emperor Energy's consultation software in accordance with Table 7-4.
	CM02: MODU PSZ (Drilling only)	**EPS2.1:** At least six weeks ahead of spud, Emperor Energy shall submit an application to NOPSEMA for the gazettal of a 500-m radius Petroleum Safety Zone (PSZ) at the well location for the duration of the drilling activity.	**MC2.1.1:** PSZ gazettal is available on the NOPSEMA website at the time of drilling..
		EPS2.2: Access into the PSZ, including approach directions and speed, shall be managed via the MODU.	**MC2.2.1:** The MODU PSZ entry log records each authorised entry and any unauthorised entry.
		EPS2.3: At least one drilling support vessel shall be stationed near the MODU at all times to guard the MODU from errant vessels.	**MC2.3.1**: Daily vessel report verifies the PSZ monitored by a support vessel.
	CM03: Marine Assurance Process (All activities)	**EPS3.1:** All vessels and the MODU shall meet the safety measures and emergency procedures of the AMSA MO 21 (SOLAS regulations).	**MC3.1.1:** Pre-qualification records for all vessels and the MODU verify that the relevant requirements of MOs 21, 27, 30, 31 and 70 are met.
		EPS3.2: All vessels and the MODU shall meet the safety measures and emergency procedures of the AMSA MO 27 (Safety of navigation and Radio Equipment), and lighting meets the International Rules for Preventing Collisions at Sea (COLREGs) and industry standards).	
		EPS3.3: All vessels and the MODU shall meet the navigation equipment, lighting, watchkeeping and radar requirements of the AMSA MO 30 (Prevention of collisions, internationally agreed measures for navigation, lights and signals to be used by a vessel).	
		EPS3.4: All vessels and the MODU will meet survey, maintenance and certification of regulated Australian vessels as per AMSA MO 31 (Survey, certification and maintenance of certificates for regulated Australian vessels).	
		EPS3.5: All vessels and the MODU shall meet the requirements of the AMSA MO 70 (Seafarer certification meets the requirements for qualifications and training).	
	CM04: Dropped objects recovery procedure (from seabed) (All activities)	**EPS4.1:** Dropped objects shall be recovered prior to demobilisation from the Operational Area, where it is assessed to be safe to do so. Where recovery is not undertaken, the justification, object description and location shall be recorded and reported in accordance with Section 8.7.3.	**MC4.1.1**: Daily reports and the dropped objects log record each dropped object, its recovery date, or the documented justification, description and location where not recovered.
EPO2: Impacts from planned overboard discharges are limited to: • Localised* and temporary changes in	**CM05:** AGR Chemical Assessment Procedure (Geotechnical survey and drilling)	**EPS5.1:** Chemicals that will be or have the potential to be discharged to the marine environment will meet the chemical acceptance criteria as the AGR Chemical Assessment Process.	**MC5.1.1**: Chemical assessment records show assessment and selection of chemicals that will or could be discharged to the marine environment

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
water and sediment quality, • Localised* and temporary behavioural changes to marine fauna and • Localised* change in benthic habitats and communities. *Localised is defined as within 500 m of the discharge location.		Chemicals used as a component of a planned drilling discharge will meet the drilling chemical acceptance criteria as per the AGR Chemical Assessment Process, including: • components of water-based mud (WBM); • stock barite; • cementing products; and • hydraulic control fluids	
	CM06: Residual materials management (Drilling only)	**EPS6.1:** Dry bulk inventories will be maintained to as low as technically required to complete the operations.	**MC6.1.1:** Daily chemical inventory reports show dry bulk inventory volumes are maintained to the minimum amount required by operations.
		EPS6.2: Following the completion of drilling, plug and abandonment of the well, excess dry bulk cement, barite and bentonite shall be treated in the following order: 1. Pumped downhole, as a slurry 2. Transferred to the next operator 3. Returned to shore for treatment/ disposal.	**MC6.2.1:** Daily Drilling Reports (DDRs) and/or daily mud and chemical reports verify that excess dry bulk cement, barite or bentonite was mixed and pumped downhole where technically feasible, with volumes documented. If downhole disposal is not feasible, communication and logistics records show transfer was offered to and accepted by the next operator, with documentation of shipping/transfer. Any excess dry bulk material not pumped downhole or unable to be transferred is returned to shore with receipts from licensed waste management facilities for treatment or disposal.
	CM07: Cementing procedures (Drilling only)	**EPS7.1:** Detailed cementing procedures shall be developed pre-spud, including provision to mix only enough cement to complete the cementing operation with allowance for loss to formation and the monitoring and reconciliation of used quantities of cement against planned quantities for each cementing operation.	**MC7.1.1:** Cementing procedure is available and dated prior to well spud. **MC7.1.2:** Daily cement reports verify use of dry bulk material were monitored and excess of bulk product reduced to ALARP, including; (a) cement volumes calculated for each operation with documented contingency for loss-to-formation. (b) used vs planned quantities reconciled for each operation, with discrepancies documented as exceptions and reviewed by the Drilling Engineer.
	CM08: Planned Maintenance System (All activities)	**EPS08.1:** Power generation and propulsion systems on the vessels and MODU will be maintained in accordance with manufacturer specifications as detailed within the PMS.	**MC08.1.1:** Vessel and MODU PMS records verify that maintenance of relevant equipment, power generation and propulsion systems is undertaken in accordance with manufacturer specifications.
		EPS08.2: Equipment used to treat planned discharges shall be maintained in accordance with manufacturer specifications as detailed within the PMS.	
	CM09: Marine assurance system - vessel contractor pre-qualification assessment (All activities)	**EPS09.1:** Oil contaminated water shall be treated via a MARPOL (or equivalent) approved oily water separator and only discharged if oil content is less than 15 ppm.	**MC09.1.1:** MODU and vessel pre-qualification records verify that a current International Oil Pollution Prevention (IOPP) Certificate is in place. **MC09.1.2:** MODU and vessel oil record books verify that oily water discharged overboard is <15 ppm.
		EPS09.2: Sewage discharged at sea shall be treated via a MARPOL (or equivalent) approved sewage treatment system.	**MC09.2.1:** MODU and vessel pre-qualification records verify that a current International Sewage Pollution Prevention (ISPP) Certificate is in place.
		EPS09.3: Food waste shall only be discharged when macerated to ≤25 mm and at a distance greater than 3 nm from land.	**MC09.3.1:** Garbage Record Books (for marine vessels >400 T or certified to carry >15 persons) and/or environmental inspection records verify that food waste was

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
			only discharged when macerated to ≤25 mm and at distance greater than 3 nm from land.
	CM38: Use of WBM during drilling (Geotechnical survey and drilling)	**EPS38.1**: Only WBM shall be used to drill geotechnical bore holes and the well.	**MC38.1.1**: Daily operations reports (for the geotechnical survey) and DDRs and Daily Muds Reports (for drilling) verify that only WBM is used.
		EPS38.2: Barite (as a WBM constituent) concentrations will be at or below: • Mercury (Hg) – 1 mg/kg (1 ppm) dry weight in stock barite. • Cadmium (Cd) – 3 mg/kg (3 ppm) dry weight in stock barite.	**MC38.2.1:** Pre-mobilisation materials inventory records verify barite concentrations at or below concentrations: • Mercury (Hg) – 1 mg/kg (1 ppm) dry weight in stock barite. • Cadmium (Cd) – 3 mg/kg (3 ppm) dry weight in stock barite.
EPO3: Change to air quality will be limited to localised and temporary impacts within the Operational Area, such that there will be no impacts to amenity outside of the Operational Area.	**CM10:** Green flare boom (Drilling only)	**EPS10.1:** A 'Green Burning' system and air compressors will be used to atomise the hydrocarbons and yield smoke-free combustion.	**MC10.1.1:** Well test contractor inspection records verify the use of a green flare boom.
	CM11: Measure and record fuel use	**EPS11.1:** Fuel use on the vessels and MODU will be measured, recorded and reported, and in the event of abnormal fuel use, corrective action is taken to minimise air pollution.	**MC11.1.1:** Daily activity reports (e.g., DDRs) record fuel use and note any abnormalities and associated maintenance.
	CM08: Planned Maintenance System (All activities)	See **EPS08.1.**	See **MC08.1.1.**
	CM03: Marine Assurance Process (All activities)	**EPS3.6:** Vessels and the MODU shall comply with MO – Part 97: Marine Pollution Prevention – Air Pollution (appropriate to vessel class) for emissions from combustion of fuel including: • Have a Ship Energy Efficiency Management Plan (SEEMP) as per MARPOL 73/78 Annex VI (for vessels >400 T). • Hold a valid International Air Pollution Prevention (IAPP) certificate and have a current international energy efficiency certificate. • Engine NOx emission levels will comply with Regulation 13 of MARPOL 73/78 Annex VI. • Sulphur content of diesel/fuel oil complies with Marine Order Part 97 and Regulation 14 of MARPOL 73/78 Annex VI (<0.5% m/m)	**MC3.6.1:** The following records verify that the vessels and MODU meet the MARPOL requirements: • Current IAPP certificate (for vessels > 400 T) • Bunker receipts verify low sulphur content (<0.5% m/m) • SEEMP (for vessels >400 T).
EPO4: No death or injury to listed threatened or migratory species from the activity from vessel collision.	**CM12:** EPBC Regulations 2000 – Part 8 Division 8.1, interacting with cetaceans. (All activities)	**EPS12.1:** Vessel Masters shall adhere to the distances and vessel management practices of EPBC Regulations (Part 8) and report vessel interactions with cetaceans. Specifically: • Vessels will not travel greater than 6 knots within 300 m of a cetacean or turtle (caution zone) and not approach closer than 100 m from a whale. • Vessels will not approach closer than 50 m for a dolphin or turtle and/or 100 m for a whale (with the exception of animals bow riding). • If the cetacean or turtle shows signs of being disturbed, project vessels will immediately withdraw from the caution zone at a constant speed of	**MC12.1.1:** Records show vessel interactions with cetaceans and shows no breaches with EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans.

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
		<6 knots, without changing direction or moving into the path of the animal. • Vessel operators shall report vessel interactions with non-foraging whales.	
		EPS12.2: Helicopters will not fly lower than 1,650 ft (500 m) when within 500 m horizontal distance of a cetacean except when landing or taking off and will not approach a cetacean from head on.	**MC12.2.1:** Helicopter logs note any deviation from routine flying heights.
		EPS12.3: Vessel strike causing injury to or death of megafauna (whales, dolphins, seals, turtles) shall be reported in line with the requirements outlined in Table 8-6.	**MC12.3.1:** Incident reports and electronic communication records verify that the incident was reported to the necessary authorities.
	CM43: Reporting and Recording (All activities)	**EPS43.1**: All environmental near-misses and incidents as defined in Section 8.7.3, including non-compliance with the EP, EPOs and EPSs, shall be communicated to AGR's HSE Manager immediately and in any case within 2 hours of identification of the incident occurring. AGR's HSE Manager shall report each such matter to the Emperor Energy COO within 12 hours of notification, or immediately where the matter is a reportable incident as defined in Table 8-6.	**MC43.1.1**: AGR incident management system records verify near-misses and incidents are logged with identification and notification dates demonstrating communication within the required timeframes. **MC43.1.2**: Electronic communication records verify the AGR HSE Manager reported near-misses and incidents to the Emperor Energy COO, within 12 hours of notification of the incident occurring.
		EPS43.2: All recordable and reportable incidents are communicated to the external appropriate authority in line with reporting time frames detailed in Table 8-6.	**MC43.2.1:** Records of external notifications are held in the Emperor Energy consultation database.
EPO5: No introduction of IMS.	**CM15:** MO 98: Marine pollution – anti-fouling systems (All activities)	**EPS15.1:** The MODU and all vessels >400 gross tonnes shall have a current International Anti-Fouling System (IAFS) certificate.	**MC15.1.1:** Pre-qualification records verify that the MODU and vessels possess a current IAFS certificate.
	CM16: Australian Ballast Water Management Requirements (All activities)	**EPS16.1:** The MODU and all vessels shall have a valid Ballast Water Management Plan and ballast water management certificate (or as appropriate to class).	**MC16.1.1:** Pre-qualification records verify that the MODU and vessels have a valid Ballast Water Management Plan and ballast water management certificate (or as appropriate to class).
		EPS16.2: Prior to mobilisation to the first drilling location for the Project, the MODU operator shall validate that the MODU complies with the Australian Ballast water Requirements (Rev 8 [2020] or subsequent revisions), specifically, ensuring the MODU has: • a valid Ballast Water Management Plan; • a ballast water management certificate: and • a ballast water record system with a minimum of 2 years records retained on board.	**MC16.2.1:** MODU inspection records demonstrate the MODU has a valid Ballast Water Management Plan, ballast water management certificate and ballast water record system with a minimum of 2 years records retained on board.
	CM17: *National Biofouling Management Guidelines for the Petroleum Production and Exploration Industry* (All activities)	**EPS17.1:** The MODU and all vessels shall be managed in accordance with the *National Biofouling Management Guidelines for the Petroleum Production and Exploration Industry* by: • implementing a biofouling management prior to entering Australian territorial waters via a biofouling management plan and record book	**MC17.1.1:** For MODU and all vessels: • the biofouling record book verifies that a current biofouling management plan has been implemented prior to entering Australian territorial waters (including movement history, inspection

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
		• conducting a biofouling risk assessment prior to mobilisation using appropriately qualified personnel to ensure risk of IMS introduction is low • based on risk assessment findings, undertake one or more of the following: ▪ in-water or drydock inspection based; ▪ clean hull / niche areas ▪ assess condition of anti-fouling coating and replenish when necessary.	reports, cleaning/maintenance history, anti-fouling coating documentation) • documented pre-mobilisation biofouling risk assessment conducted by appropriately qualified personnel indicating 'low-risk' for IMS introduction, with any identified mitigation actions documented and closed out • inspection (in-water or drydock pending risk assessment findings) reports include hull condition, niche area condition, anti-fouling coating condition, with photographic or video evidence, with any identified follow-up actions documented and closed out.
	CM18: *Australian Biofouling Management Requirements* (Drilling only)	**EPS18.1:** Prior to mobilisation to the Operational Area, the MODU Operator shall validate to Emperor Energy that the MODU has a biofouling management plan and record book consistent with the *Australian Biofouling Management Requirements* (DAFF 2023) and the IMO Biofouling Guidelines.	**MC18.1.1:** MODU pre-qualifications records verify that the MODU has a biofouling management plan and record book in place consistent with IMO Biofouling Guidelines.
	CM19: IMS Biofouling Risk Assessment Process (All activities)	**EPS19.1:** Before mobilisation to the region, all vessels and relevant immersible equipment are determined to be low risk of introducing IMS of concern and maintain this low-risk status through to mobilisation to the Operational Area.	**MC19.1.1:** Records of IMS Biofouling Risk Assessment indicating low-risk rating for all vessels and relevant immersible equipment.
	CM43: Reporting and Recording (All activities)	See **EPS43.1**.	See **MC43.1.1.**
		See **EPS43.2.**	See **MC43.2.1.**
EPO6: No unplanned release of hazardous materials to the marine environment.	**CM03:** Marine Assurance Process. (All activities)	**EPS3.7:** Vessels and MODU shall meet the requirements of the MO 95 (Marine pollution prevention – garbage) 2013, such that: • a Garbage Management Plan (GMP) that complies with Annex V of MARPOL is implemented • waste hierarchy is applied to project wastes • waste with potential to be windblown shall be stored in covered containers • waste lost overboard is recorded and recovered if possible, and waste transfers are recorded.	**MC3.7.1:** Pre-qualifications records verify that GMPs are in place and current. **MC3.7.2:** Records show vessels and MODU meet the requirements of Marine Order 95 (Marine pollution prevention – garbage) 2013.
	CM05: AGR Chemical Assessment Procedure (Geotechnical survey and drilling)	See **EPS5.1.**	See **MC5.1.1.**
		See **EPS5.2.**	See **MC5.2.1.**
	CM20: Bunkering procedures (Drilling only)	**EPS20.1:** Chemical and hydrocarbon bunkering (refuelling) shall be undertaken in accordance with the MODU and support vessel bunkering procedures.	**MC20.1.1:** Completed permits to work, risk assessments and/or bunkering checklists verify that bunkering is undertaken in accordance with bunkering procedures.

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
	CM21: Drain management (All activities)	**EPS21.1:** All overboard discharge points from areas containing potentially hazardous substances, including the MODU mud pits, shall be locked closed during operations and only opened under a permit.	**MC21.1.1:** MODU and vessel inspection records show overboard discharge points from areas containing potentially hazardous substances, including the MODU mud pits, are locked closed and only opened under permit.
	CM22: Spill containment (All activities)	**EPS22.1:** Materials and equipment that have the potential to spill onto the deck or marine environment shall be stored within a contained area.	**MC22.1.1:** MODU and vessel inspection records show appropriate material and equipment with spill potential are stored in a contained area.
	CM23: Fire Fighting Foam Screening and Quarantine (All activities)	**EPS23.1:** All vessels must not use or store firefighting foams containing perfluorooctane sulfonic acid (PFOS) (not above 10 mg/kg (0.001% by weight as specified under SOLAS Chapter II-2), in accordance with IMO Resolution MSC.532(107) and implemented by MO 15. The prohibition entered into force on 1 January 2026 and applies as: • Ships constructed on or after 1 January 2026 be compliant no later than 1 January 2026. • Ships constructed before 1 January 2026 be compliant no later than the date of the first scheduled SEQ Survey (Annual / Periodical / Intermediate / Renewal) on or after 1 January 2026.	**MC23.1.1:** Pre-qualification vessel inspection records confirm firefighting foams do not contain PFOS.
		EPS23.2: From 01 July 2025, firefighting foams for well construction activities (i.e. response standby Aqueous Film Forming Foam (AFFF) for the well test package) will not contain PFOS, PFOA, PFHxS and related substances in compliance with IChEMS (Schedule 7). Firefighting foam SDS will be screened for these substances; any firefighting foams that do not comply with this requirement as of 01 July 2025 will not be used or stored offshore, or, if any legacy products are found offshore, they will be quarantined.	**MC23.2.1:** SDS for firefighting foams verify that they do not contain PFOS, PFOA, PFHxS and related substances.
	CM43: Reporting and Recording (All activities)	See **EPS43.1.**	See **MC43.1.1**:
		See **EPS43.2.**	See **MC43.2.1.**
EPO7: No unplanned release of hydrocarbons to the marine environment.	**CM02:** MODU PSZ (Drilling only)	See **EPS2.1.**	See **MC2.1.1.**
		See **EPS2.2.**	See **MC2.2.1.**
		See **EPS2.3.**	See **MC2.3.1.**
	CM03: Marine Assurance Process. (All activities)	See **EPS3.1., EPS3.2** and **EPS3.3.**	See **MC3.1.1.**
		See **EPS3.4.**	See **MC3.4.1** and **MC3.4.2.**
		See **EPS3.5.**	See **MC3.5.1.**
	CM24: SOPEP/ SMPEP (All activities)	**EPS24.1:** The All vessels and the MODU shall have a SOPEP/SMPEP (or equivalent appropriate to class), verified as current prior to mobilisation.	**MC24.1.1:** Pre-qualification records verify that each vessel and the MODU has a current SOPEP/SMPEP (or equivalent appropriate to class).

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
		EPS24.2: The SOPEP/SMPEPs will be tested at intervals specified in the SOPEP/SMPEP (not exceeding 3 months), with at least one test completed prior to the commencement of drilling activities.	**MC24.2.1:** Dated test records demonstrate SOPEP/SMPEP testing is undertaken at the frequency specified in each.
		EPS24.3: In the event of a spill to deck or the marine environment, the SOPEP/SMPEP will be initiated immediately upon detection of the spill.	**MC24.3.1:** Incident records verify that the SOPEP/SMPEP was implemented in accordance with the directions provided in the document.
	CM25: AIS transceiver (All activities)	**EPS25.1:** All vessels and the MODU shall be fitted with an automatic identification system (AIS) transceiver enabling the MODU and vessels to receive the data broadcasted by surrounding vessels, such as Maritime Mobile Service Identity (MMSI) number, IMO number, VHF call sign, speed, heading and course over ground.	**MC25.1.1:** MODU and vessel inspection records show MODU/vessels are fitted with an AIS transceiver.
		EPS25.2: Emperor Energy provides pre-activity notification to the AHO at least three weeks prior to commencement of each activity to enable the promulgation of the NTM.	**MC25.2.1:** Each activity is listed in a NTM on the Australian Hydrographic Office website relevant to the time the activity is being undertaken.
	CM26: NOPSEMA-accepted MODU Safety Case Revision (Drilling only)	**EPS26.1:** Prior to commencement of MODU operations, Emperor Energy shall validate that the MODU Safety Case, including the Emperor Energy activity-specific revision, is in place and implemented, and that safety notification and reporting arrangements for MODU operations are established in accordance with the Regulations (as applicable).	**MC26.1.1:** Dated validation record, completed prior to commencement of MODU operations, shows the accepted Safety Case and activity-specific revision in place and the notification/reporting arrangements established.
	CM27: NOPSEMA-accepted OPEP (All activities)	**EPS27.1:** Implement spill preparedness and response in accordance with EPSs listed in OPEP Appendix G.	**MC27.1.1:** OPEP testing records, incident logs and IAPs verify that spill response was implemented in accordance with EPSs in the OPEP.
	CM28: OSM-BIP (All activities)	**EPS28.1:** Implement the OSM-BIP in accordance with the OSM-BIP EPSs listed Appendix G of the OPEP (OPEP CM28 for preparedness and OPEP CM29-CM35 for response).	**MC28.1.1:** Per OPEP CM28 for preparedness and OPEP CM29-CM35 for response.
	CM29: NOPSEMA-accepted WOMP (Drilling only)	**EPS29.1:** Well integrity shall be maintained in accordance with the WOMP.	**MC29.1.1:** Well integrity inspection and testing records verify that the WOMP is implemented.
	CM30: PMS – BOP testing (Drilling only)	**EPS30.1:** The BOP shall be routinely function and pressure tested in accordance with manufacturer's specifications and in alignment with the drilling contractor's PMS.	**MC30.1.1:** BOP maintenance records show maintenance in accordance with manufacturer's specifications and in alignment with Drilling Contractor's preventative maintenance system
	CM40: BOP – Functional Tests (Drilling only)	**EPS40.1:** The BOP will be function tested as per the schedule outlined in the NOPSEMA-approved WOMP during the campaign	**MC40.1.1:** Dated BOP function and pressure test records demonstrate testing at the WOMP/manufacturer frequencies; any failed test record shows rectification and successful retest before operations resumed.
	CM43: Reporting and Recording (All activities)	See **EPS43.1.**	See **MC43.1.1** and **MC43.1.2.**
		See **EPS43.2.**	See **MC43.2.1.**
	CM44: AMOSC membership (All activities)	**EPS44.1:** Emperor Energy will have in place associate membership with AMOSC prior to commencing the activity, which remains in force for the duration of the activity.	**EPS44.1.1:** Associate membership contract is available and verifies that it was signed prior to well spud and is current at the time of drilling.

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
	CM45: Relief well critical equipment availability and supply chain readiness (Drilling only)	EPS45.1: Emperor Energy will maintain a backup wellhead system and 30" conductor string, ensuring that these long lead components are immediately available if a relief well is required.	MC45.1.1: Contracts verify that the wellhead system and 30" conductor string are available prior to spud and throughout the drilling campaign.
EPO8: Seabed disturbance will be limited to localised disturbance to benthic assemblages within the Operational Area, with no impacts to ecosystem function or services and no impact on UCH.	CM31: Site surveys (Geophysical survey only)	EPS31.1: Geophysical site survey will be undertaken prior to finalising the approach path, well location and MODU position and no later than 1 month before MODU positioning. Site surveys will identify whether the following seabed obstacles in the Operational Area are present so that they can be avoided: • sensitive benthic habitats (i.e. high relief outcrops and reefs, sponge beds, corals) • maritime archaeological heritage (i.e. shipwrecks) • submerged landscape which may hold culturally significant features to First Nations • tangible UCH values and sensitivities • UXOs.	MC31.1.1: Geophysical survey records and mapping verify that the survey was undertaken.
		EPS31.2: Appropriately qualified specialists including suitably qualified benthic ecologist or similar, geophysical data analyst, and underwater archaeologist or equivalent specialist (e.g., Cosmos Archaeology, Extent Heritage, Fathom Archaeology) with familiarity with First Nations cultural landscapes and experience in identifying landscape features from geophysical data, and geophysical data analyst will be used to help identify the seabed obstacles listed in EPS31.1.	MC31.1.2: Specialist report verifies that geophysical survey data was analysed to determine the presence of UCH.
	CM32: MODU move and positioning analysis (Drilling only)	EPS32.1: A MODU move and positioning analysis shall be undertaken prior to the selection of the approach path, well location and MODU positioning location to ensure the following are avoided: • high relief outcrops and reefs • maritime archaeological heritage (i.e. shipwrecks) • tangible UCH values and sensitivities • UXOs.	MC32.1.1: MODU move and positioning analysis report verifies avoidance of mapped seabed obstacles.
	CM33: MODU move and positioning plan (Drilling only)	EPS33.1: The MODU approach path, well location and MODU positioning location shall be within the Operational Area, avoiding seabed obstacles as identified in CM32.	MC33.1.1: MODU move and positioning plan verifies avoidance of mapped seabed obstacles.
	CM34: Maintenance and removal of property (Drilling only)	EPS34.1: Emperor Energy will meet the requirements of Section 572 of the OPGGS Act such that upon well abandonment, all subsea equipment shall be removed from the sea floor, with casing and conductor cut below the mudline and retrieved to surface.	MC34.1.1: The well abandonment report verifies that all subsea equipment was removed from the sea floor.
	CM35: UCH analysis and unexpected finds protocol (Post-geophysical survey)	EPS35.1: Review of geophysical site survey data will be completed by a suitably qualified and experienced maritime archaeologist or equivalent specialist (such as Cosmos Archaeology, Extent Heritage, or Fathom Archaeology), with familiarity with First Nations cultural landscapes and experience in identifying landscape features from geophysical data in accordance with the requirements detailed in s.VII of the UNESCO Manual for	MC35.1.1: Specialist archaeologist report is available, verifying that analysis of geophysical data for UCH took place.

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
		Activities Directed at Underwater Cultural Heritage (Maarleveld, Guerin, Egger 2013: 163-176) to identify UCH values in the area [VIC-HC-03; #414; #416]. In the event of the discovery of UCH during surveys or afterwards during data analysis, in alignment with the obligations in the UCH Guidelines (DCCEEW, 2024f), the following unexpected finds protocol will be enacted to ensure the protection provisions under all sections of the UCH Act [#414; #416]: • Activities that have the potential to impact suspected or known UCH must cease immediately, Records of the UCH including imagery, description and location must be retained. • The UCH must be reported to the activity Supervisor • Knowledge of the UCH location with an appropriate buffer, taking into consideration the nature and scale of the potential UCH and the activities that are to be managed, will be shared as part of the HSE induction and its location flagged in relevant procedures to ensure UCH is avoided and protected. • If the potential UCH appears to be First Nations UCH, Emperor Energy will notify the Minster through the Australasian Underwater Cultural Heritage Database (AUCHD) within 21 days of the discovery under s40 of the UCH Act and Heritage Victoria [#414; #416]. • If the potential UCH appears to be First Nations UCH, the appropriate First Nations peoples will be notified to determine whether it is UCH site, and if so, how the site will be managed. • If the potential UCH appears to be a shipwreck or aircraft wreck that is older than 75 years or is otherwise reportable under s40 of the UCH Act, Emperor Energy will notify the Minster through the AUCHD within 21 days of the discovery. • If the unexpected finds includes the suspected discovery of First Nations human remains, Emperor Energy will notify: ▪ The Australian Federal Police ▪ The Minister in accordance with s20 of the *Aboriginal and Torres Strait Islander Protection Act 1984*, with the locations of the remains, and advise that it may be appropriate to have a First Nations people representative during the assessment or handling of the remains. • Activities will not commence in the vicinity of the UCH object or site until written approval is provided by Emperor Energy, once the above procedure has been implemented, or where the potential UCH is confirmed not to be UCH.	
		EPS35.2: Knowledge of the UCH location with an appropriate buffer, taking into consideration the nature and scale of the potential UCH and the activities that are to be managed, will be shared as part of the HSE induction for the MODU crew and its	**MC35.2.1:** HSE induction records verify that a buffer around the UCH location was communicated to MODU crew.

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
		location flagged in relevant procedures to ensure UCH is avoided and protected [#414; #416].	
	CM42: UCH disturbance risk management measures (Geotechnical survey and drilling)	**EPS42.1:** If the UCH analysis identifies suspected or confirmed UCH within areas that cannot be fully avoided due to safety, geotechnical, or operational constraints, a permit will be sought under s23 of the UCH Act to lawfully undertake the activity.	**MC42.1.1:** A permit under s23 of the UCH Act to lawfully undertake the activity is available.
EPO9: Undertake ongoing engagement with relevant First Nations groups to ensure identified tangible and intangible UCH and potential risks to submerged landscapes remains current and is protected.	**CM01:** Ongoing Consultation (All activities)	See **EPS1.1.**	See **MC1.1.1** and **MC1.1.2.**
		See **EPS1.2.**	See **MC1.2.1.**
	CM35: UCH analysis and unexpected finds (Post-geophysical survey)	See **EPS35.1.**	See **MC35.1.1.**
EPO10: Impacts to marine fauna from light emissions will be no greater than a localised** and temporary consequence to individuals, with no population level impacts. ** Localised as defined as the light EMBAs	**CM36:** Light Management Procedure (Drilling only)	**EPS36.1:** A Light Management Procedure will be developed by appropriately qualified lighting practitioners, together with an appropriately qualified marine biologist or ecologist and will be implemented as per the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023b), and relevant species management plans. Under DCCEEW (2023b) the Light Management Procedure will consider: • EPBC Act listed species, recovery and wildlife conservation plans, approved conservation advice for listed threatened species. • State environmental legislation, regulations, and policy and guidance documents • Up-to-date scientific literature • Local and Indigenous knowledge resulting from stakeholder consultation. The Light Management Procedure will include: • A review and risk assessment of existing lighting to minimise non-essential and outward facing lights but ensuring safety and navigational lighting plus safe work condition conditions are maintained. • The identification of susceptible wildlife, including relevant biological characteristics and behaviour. • Procedures for managing grounded birds (including factoring in handling protocols in light of the bird flu virus that is spreading as of mid-2026). • Reporting and recording requirements for grounded birds including remote advice from Zoos Victoria Marine Response Unit (MRU) or equivalent.	**MC36.1.1:** A light management procedure is in place.

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
		• The requirement for flaring activities to start in daylight hours where operational safety and testing requirements allow and do not present an unacceptable risk to personnel, property and the environment	
	CM03: Marine Assurance Process (All activities)	See **EPS3.1., EPS3.2** and **EPS3.3.**	See **MC3.1.1.**
		See **EPS3.4.**	See **MC3.4.1** and **MC3.4.2.**
		See **EPS3.5.**	See **MC3.5.1.**
	CM37: IFC EHS Guidelines - Offshore Oil and Gas Development (2015) for flaring activities (Drilling only)	**EPS37.1:** Emperor Energy shall verify that the well test contractor will comply with IFC EHS guidelines with respect to maximising flaring efficiency, specifically: • maintenance program to ensure maximum flare efficiency • use of a reliable pilot ignition system • minimum volume of hydrocarbons required for well testing to the flared and durations reduced to the extent practical.	**MC37.1.1:** Pre-qualification records verify that the well test contractor will implement the IFC EHS guidelines for flaring. **MC37.1.2:** Completed well clean-up, well testing records and safety checklist verifies that the IFC EHS guidelines for flaring activities were implemented.
EPO11: Underwater noise emissions from Project Activities in BIAs will be managed such that: • Any blue whale continues to utilise BIAs without injury and is not displaced from a foraging area. • It does not prevent any southern right whale from utilising BIAs or habitat critical to the survival of a species or cause auditory impairment (TTS and Auditory Injury). • Biologically important behaviours can continue while Project Activities are being undertaken.	**CM13:** Whale Management Procedure (All activities)	**EPS13.1:** The Whale Management Procedure (see Section 8.4.5) will be implemented for the activity. The procedure will include the following details. Prior to an activity commencing, a 30-minute pre-activity survey for whales will be undertaken for activity-specific survey zones. The survey zones of each relevant activity are: • VSP: 3 km from the MODU • 2D survey: 1.5 km from the survey vessel • Mobilisation, MODU positioning, demobilisation: 5.5 km from the MODU • Drilling operations: 2.5 km from the MODU • Drilling operations with a vessel on standby: 3.5 km from the MODU • Drilling operations with a vessel undertaking resupply operations: 5.5 km from the MODU • Well P&A and removal (i.e. wellhead cutting): 3.1 km from the MODU. If a whale is sighted within the survey zones, the activity will not commence until: • No whales are observed for 30 minutes within the survey zone; or • Whales are observed leaving the survey zone. Soft starts are to be undertaken where technically possible for VSP and 2D surveys under the EPBC Act Policy 2.1 to slowly ramp up the acoustic source to allow fauna to move away from the source. Shutdowns are to be undertaken where technically possible. Night-time and low visibility procedures are to be undertaken under the EPBC Act Policy 2.1 such that activities can commence at night or in low visibility conditions (i.e., when observations cannot be undertaken) if no more than three whales have been seen in the survey zone in the preceding daylight hours and there was a two-hour period of no sightings in the survey zone.	**MC13.1.1:** MFO reports demonstrate that the Whale Management Procedure (vessel and drilling operations) was implemented.
	CM14: Marine Fauna Observer	**EPS14.1:** Marine fauna observations will be undertaken in accordance with Emperor Energy's Whale Management Procedure (see Section 8.4.5).	**MC14.1.1:** MFO reports verify MFO coverage maintained as required.

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
	(All activities)	• Geophysical and geotechnical survey vessels - will each have one dedicated Lead MFO undertaking MFO observations, sourced from a specialist MFO service provider (such as RPS, EPI Group or Blue Planet Marine), who is experienced and competent in detecting and identifying large baleen whales, particularly blue whales and southern right whales. • MODU – during VSP, will have at least one appropriately trained crew member conducting MFO observations on active duty who has completed the MFO Program Induction and is capable of supporting marine fauna observations. • Rig move vessels – on one of the vessels at the time of MODU positioning when vessel DP thrusters are in use, a dedicated Lead MFO who is experienced and competent in detecting and identifying large baleen whales will undertake marine fauna observations.	
		EPS14.2: Emperor Energy will verify MFOs' capacity and competency by ensuring: • A Lead MFO will be appointed who has extensive offshore experience, including participation in multiple marine fauna observing campaigns, with demonstrated capability in detecting and identifying blue whales and southern right whales within BIAs (or international equivalents). • During periods where daylight exceeds 12 hours, a second dedicated MFO will be present. This MFO must have completed at least one offshore observing campaign and be familiar with identification characteristics for blue whales and southern right whales. • All dedicated MFOs must demonstrate prior competency in identifying large baleen whales, estimating distances, and applying established recording and reporting systems. They must also understand applicable Australian regulatory requirements. • MFOs will be sourced from specialist service providers or equivalent (such as RPS, EPI Group or Blue Planet Marine), with recognised expertise in marine fauna observation. • MFO qualifications and experience will be verified by the service provider and subsequently confirmed by Emperor Energy prior to mobilisation. • Vessel Officers of the Watch will support MFO activities. Bridge crews will receive activity-specific induction and whale identification training and will already possess a high baseline of observation and watchkeeping competency. As collision avoidance and minimising disturbance to endangered whales are universal requirements for offshore users, these crews contribute to effective monitoring. • Helicopter crews will also undergo the MFO Program Induction. • The MFO Program Induction will be completed by all dedicated MFOs, vessel and MODU Officers of the Watch, and helicopter crews. The induction will cover: ▪ An overview of the activity.	**MC14.2.1:** Records show MFO appropriately qualified. **MC14.2.2:** MFO reports show MFO coverage maintained as required. **MC14.2.3:** Daily reports show MFO coverage maintained as required. **MC14.2.4:** MFO program induction records for Vessel and MODU Officers of the Watch.

ENVIRONMENTAL PERFORMANCE OUTCOME	CONTROL MEASURE	ENVIRONMENTAL PERFORMANCE STANDARD	MEASUREMENT CRITERIA
		▪ The species of focus and rationale for inclusion. ▪ Marine fauna monitoring and action requirements. ▪ Implementation of whale observation, species identification and safe operating distances between vessels and whales as per EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans which is implemented via the Australian National Guidelines for Whale and Dolphin Watching 2017 (CoA 2017c). ▪ Identification criteria for endangered whale species. ▪ Reporting and documentation requirements pre-activity surveys for specific activities (as per CM13). ▪ Night-time and low visibility controls (as per CM13). • Reporting requirements including the completion and distribution of: ▪ MFO sightings records. ▪ MFO records detailing appropriate adaptive management practices that have been implemented. ▪ Daily Reports.	
	CM12: EPBC Regulations 2000 – Part 8 Division 8.1 interacting with cetaceans (All vessels, excluding MODU)	See **EPS12.1.**	See **MC12.1.1.**
		See **EPS12.2.**	See **MC12.2.1.**
	CM08: Planned Maintenance System (All activities)	See **EPS08.1.**	See **MC08.1.1.**
		See **EPS08.2.**	
	CM41: Relocating the support vessel outside the PSZ when the resupply vessel is alongside the MODU (Drilling only)	**EPS41.1:** The support vessel will be repositioned outside the PSZ while the resupply vessel is alongside the MODU to reduce continuous underwater noise associated with the continuous use of DP for resupply operations. **EPS41.2:** The support vessel will continue to undertake essential safety-critical functions—including vessel-interaction monitoring, emergency response readiness, and oversight of the PSZ—while maintaining required response capability.	**MC41.1.1**: Daily vessel reports to record vessel location during resupply operations.
EPO12: Undertake oil spill response in a manner that will not result in additional impacts to marine environment, coastal habitat and oiled wildlife.	**CM27:** NOPSEMA-accepted OPEP(All activities)	See **EPS27.1**	See **MC27.1.1**
	CM28: OSM-BIP (All activities)	See **EPS28.1**	See **MC28.1.1.**
	CM39: SCERP (Drilling only)	See all EPS listed in the OPEP Appendix G under OPEP CM01 (SCERP).	See all EPS listed in the OPEP Appendix G under OPEP CM01 (SCERP).
	CM43: Reporting and Recording (All activities)	See **EPS43.1.**	See **MC43.1.1.**
		See **EPS43.2.**	See **MC43.2.1.**

6. HYDROCARBON POLLUTION EMERGENCY RESPONSE

The credible worst-case hydrocarbon release scenarios have been identified as:

- Loss of well control (LOWC) resulting in an uninterrupted flow of condensate at the sea surface for 77 days at continuous release of 717 m^3/day (4,514 bbl per day), resulting in a total release of 55,256 m^3 (347,584 bbl) over 77 days.
- Vessel fuel tank rupture resulting in the total loss of containment of MDO from a fuel tank (280 m^3) over 6 hours to the sea surface. This LoC volume has been applied to the geophysical and geotechnical vessels as well as the drilling support vessels
    - Geophysical survey vessels (and to a lesser extent geotechnical vessels) generally have considerably smaller fuel tank capacities than drilling support vessels, so while the MDO spill scenario also covers the geophysical and geotechnical survey campaigns, the volume of fuel likely to be released in a LoC event for these campaigns would be significantly smaller and therefore, the modelling results for these campaigns are considered overly conservative.

6.1. Evaluation of Response Strategies

A structured evaluation framework is used here to assess the suitability and effectiveness of available response strategies to reduce environmental impacts to ALARP in the event of a hydrocarbon release. The primary objective of any response strategy is to minimise harm to the environment. However, it is recognised that some response options may introduce additional environmental impacts if they are poorly selected, incorrectly implemented, or inadequately planned. Accordingly, the likely outcomes of each response option must be carefully evaluated prior to implementation.

This evaluation considers multiple factors for each potential response strategy, including anticipated environmental outcomes, potential secondary impacts or risks, operational and functional constraints, and the applicability of the strategy to the specific hydrocarbon type involved.

Response strategies for the credible worst-case scenarios outlined in this section take into consideration the actionable level for when a response is physically possible (described in Section 1.5 of the OPEP), as well as prioritises response areas based on areas of sensitivity.

6.1.1. Strategic NEBA

Net Environmental Benefit Analysis (NEBA) is a structured decision-making process used in both oil spill preparedness (pre-spill strategic planning) and spill response (operational). It aims to identify ecological, social and economic receptors at risk, evaluate and compare benefits of individual response strategies, and determine which combination of actions will reduce the impact of the hydrocarbon spill on the environment.

The focus of the NEBA is to compare the environmental consequences that would occur if no action were taken against the identified sensitivities versus if each available response strategy was implemented.

The NEBA process comprises of four stages:

1. Compile and evaluate data to identify an exposure scenario and potential response options, and to understand the potential impacts of that spill scenario.
2. Predict the outcomes for the given scenario, to determine which techniques are effective and feasible.

3. Balance trade-offs by weighing a range of ecological benefits and drawbacks resulting from each feasible response option. In some countries this will also include an evaluation of socioeconomic benefits and costs resulting from each feasible response option.
4. Select the best response options for the given scenario, based on which combination of tools and techniques will minimize impacts.

Pre-spill Strategic NEBA provides an overarching assessment of the different response strategies that have been considered for the sensitivities at risk within the EMBA and the viability of those strategies.

Table 6-1 provides a summary of the evaluation of response strategies that could be deployed to mitigate a worst case LOWC or MDO including;

1) Primary response strategies – measures intended to be implemented as soon as practicable following a hydrocarbon release;
2) Secondary response strategies – measures implemented where required and where practicable;
3) Not applicable response strategies – measures that are unsuitable for the specific hydrocarbon type or spill characteristics; and
4) Rejected response strategies – measures that are not proposed due to unacceptable environmental, operational, or risk-related outcomes.

This section provides the evaluation framework constructed for each available strategy and their applicability to the credible and worst-case hydrocarbon release scenarios identified for the activity (Table 6-1). In the event of a hydrocarbon release during the activity, the Incident Management Team (IMT) will review the response options identified by the detailed strategic NEBA outlined in the OPEP Section 4.2.1 prior to implementation, as a part of the IAP process, to ensure they remain valid and effective strategies.

Table 6-1: Response Strategy Evaluation

RESPONSE STRATEGY	ENVIRONMENTAL BENEFIT(S)	POTENTIAL ENVIRONMENTAL IMPACTS / RISKS	FUNCTIONAL/OPERATIONAL CONSTRAINTS	CONDENSATE			MDO		
				RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION	RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION
Source Control (BOP Intervention)	Restricting or halting the flow of hydrocarbons from the well reducing the total volume of hydrocarbons released into the environment, reducing the overall potential impact to the environment.	Risks / impacts from operation of MODU and vessels (e.g. seabed disturbance, liquid waste, air emissions from fuel usage, noise disturbance, marine fauna interaction, interference with other users, vessel collisions, etc.).	The surface Blowout Preventer (BOP) is the first line of defence in regaining well control. Activation of the BOP reduces the consequence of a LOWC by shutting in the well to stop or significantly restrict flow. The BOP is maintained, tested, and operated in accordance with API Standard 53 and the drilling contractor's procedures, ensuring that barriers are functioning and that intervention can be executed immediately following an influx. Effective only if BOP barriers are not fully compromised.	Yes	Primary	Will be implemented in order to attempt to regain control of well through operation of the BOP.	No	NA	MDO spills only occur from vessels and therefore BOP intervention is not applicable to controlling this source
Source Control (Capping Stack)		Risks / impacts from operation of heavy lift vessels (e.g. liquid waste, air emissions from fuel usage, noise, marine fauna interaction, interference with other users, collisions, etc.). Seabed disturbance from positioning of capping stack.	The design of the Judith 2 well program using a JUR and a surface BOP system does not allow for the use of a subsea capping stack.	No	N/A	The design of the Judith 2 well program using a JUR and a surface BOP system does not allow for the use of a subsea capping stack. .	No	NA	MDO spills only occur from vessels and therefore capping stacks are not applicable to controlling the source
Source Control (Relief Well)		Risks / impacts from operation of MODU and vessels (e.g. seabed disturbance, liquid waste, air emissions from fuel usage, noise, marine fauna interaction, interference with other users, collisions, etc.).	Timeframe to mobilise a relief MODU to Victoria; dependent on the national/international availability of a suitable relief rig. Available rigs will be monitored on a monthly basis to ensure mobilisation of relief rigs remains feasible within the assumed timeframes. Health and safety of relief MODU and personnel.	Yes	Primary	The drilling of a relief well is a primary response strategy and the only permanent solution for a LOWC event.	No	NA	MDO spills only occur from vessels and therefore relief wells are not applicable to controlling the source

RESPONSE STRATEGY	ENVIRONMENTAL BENEFIT(S)	POTENTIAL ENVIRONMENTAL IMPACTS / RISKS	FUNCTIONAL/OPERATIONAL CONSTRAINTS	CONDENSATE			MDO		
				RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION	RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION
		Discharge of chemicals/cement to the environment.							
Source Control (Subsea dispersant application)		Risks/impacts from applying dispersant into the marine environment. Risks / impacts from operation of vessels (e.g. seabed disturbance, liquid waste, air emissions from fuel usage, noise, marine fauna interaction, interference with other users, collisions, etc.).	Subsea dispersant injection (SSDI) may reduce volatile organic compounds (VOCs) at sea surface within the response area, therefore creating a safer work environment for responders.	No	NA	Chemical dispersants are considered ineffective for gas-condensate hydrocarbon releases. The design of the Judith 2 well program using a JUR and a surface BOP system removes the capability for injection of subsea dispersant into a subsea wellhead.	No	NA	MDO spills on occur on the surface and therefore subsea dispersant application is not a suitable response strategy.
Source Control (Subsea First Response Toolkit)		Risks / impacts from operation of MODU and vessels (e.g. seabed disturbance, liquid waste, air emissions from fuel usage, noise disturbance, marine fauna interaction, interference with other users, vessel collisions, etc.).	Timeframe to access SFRT (i.e. from contract with AMOSC/Oceaneering, stockpile located in W.A)	No	NA	SFRT cannot be deployed for a jack-up drilling program, therefore this response strategy is not technically feasible.	No	NA	MDO spills only occur from vessels and therefore SFRT are not applicable to controlling the source
Source Control (Shipboard Oil Pollution Emergency Plan)	The SOPEP contains details on applicable strategies (i.e., fuel transfer procedures) to reduce or minimise the volume of hydrocarbons released in the event of that a vessel storage tank is ruptured.	Outdated or irrelevant contents of plan through irregular updates. Non-applicable or superseded information could lead to delayed or ineffective response preventing an intervention in fuel loss (e.g. air emissions, noise,	Availability and validity of plan to ensure strategies included are still relevant and easily applied. Presence of trained individuals familiar with the document and its location.	No	NA	This is not a requirement for a LOWC scenario. This is an International Convention for the Prevention of Pollution from Ships (MARPOL) requirement for applicable vessels.	Yes	Primary	Primary response strategy for all spills in accordance with vessel SMPEP/SOPEP. AMSA is the Control Agency in the event of a stricken vessel in Commonwealth waters

RESPONSE STRATEGY	ENVIRONMENTAL BENEFIT(S)	POTENTIAL ENVIRONMENTAL IMPACTS / RISKS	FUNCTIONAL/OPERATIONAL CONSTRAINTS	CONDENSATE			MDO		
				RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION	RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION
		fuel use, waste generation etc.).							and may deploy NatPlan resources.
In-situ Burning	To remove hydrocarbons from the marine environment.	High risks and safety concerns associated with the combustion of hydrocarbons. Risks/ impacts from operations of vessels and aircraft (e.g. liquid waste, air emissions from fuel usage, noise, marine fauna interaction, interference with other users, vessel collisions, etc.).	Health and safety requirements. Logistics to coordinate response. Fire resistant boom not available within Australia, coordination of equipment and trained personnel from outside of Australia would be required. High costs associated. Specific hydrocarbon thickness required for response to be feasible. Thin and fast-spreading hydrocarbons such as condensate make ISB not an ideal response option. Calm metocean conditions required.	Partial	Reject	Potentially feasible, response strategy has not been executed in Australia before. Strategy rejected due to the fate and behaviour (high volatility and spreading) of the condensate gas.	Partial	Reject	Potentially feasible, response strategy has not been executed in Australia before. Strategy rejected due to the fate and behaviour (high volatility and spreading) of the condensate gas.
Monitoring and Evaluation	To maintain situational awareness, and ongoing monitoring and evaluation of the response. Required for real-time decision making during a spill event. Identifies emerging risks to sensitive receptors; information for response planning and assessment of effectiveness of response actions.	Risks/ impacts from operations of monitoring vessels and aircraft (e.g. liquid waste, air emissions from fuel usage, noise, marine fauna interaction, interference with other users, vessel collisions, etc.).	Visual observation activities at night or during poor weather restricted. Stringent safety management requirements for aerial and marine operations employed. Coordination of multiple vessels within limited area.	Yes	Primary	This primary response strategy is critical for gaining and maintaining situational awareness to inform the response and remediation operations. Specifics will be dependent on the nature and extent of the spill.	Yes	Primary	This primary response strategy is critical for gaining and maintaining situational awareness to inform the response and remediation operations. Specifics will be dependent on the nature and extent of the spill.
Natural Dispersion	Allowing natural processes to break down the hydrocarbons present within the marine environment.	No risks/impacts identified.	No functional/operational constraints identified.	Yes	Primary	Strategy is effective due to the characteristics of the condensate gas, and the metocean characteristics of the activity location.	Yes	Primary	Strategy is effective due to the characteristics of the condensate gas, and the metocean characteristics of the activity location.

RESPONSE STRATEGY	ENVIRONMENTAL BENEFIT(S)	POTENTIAL ENVIRONMENTAL IMPACTS / RISKS	FUNCTIONAL/OPERATIONAL CONSTRAINTS	CONDENSATE			MDO		
				RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION	RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION
Dispersant Application (surface – vessel and aerial)	Breakdown surface spills into small droplets within the water column. Allows for increased biodegradation, reducing the potential threat to marine fauna.	Risks/impacts from applying dispersant into the marine environment. Risks / impacts from operation of vessels and/or aircraft (e.g. seabed disturbance, liquid waste, air emissions from fuel usage, noise, marine fauna interaction, interference with other users, collisions, etc.).	Not recommended for Group I oils such as condensate gas due to the very low viscosity and high volatility – generally no environmental benefit gained by the application on Group I oils. Dispersant considered "conditional" for Group II oil. The ITOPF Technical Information Paper 4 – Dispersant Application1 states that light products (including gas condensate) generally do not form emulsions but rather a thin layer or sheen that evaporate and dissipate quickly. It is considered good practice that dispersants are not applied, rather other response options are used to recover the minimal remaining product in the environment. For vessel application - having vessels travel through gas condensate is not advisable and poses a hazard to responders due to the volatility of the gas condensate when released.	No	N/A	Strategy not effective due to the characteristics and properties of the condensate gas.	Partial	Reject	Strategy partially effective due to the characteristics and properties of MDO. Although dispersant is considered "conditional" for Group II oil, the size of the potential spill volume and the natural tendency of spreading into very thin films is evidence that dispersant will be an ineffective response. The dispersant droplets will penetrate through the thin oil layer and cause 'herding' of the oil.
Containment and Recovery	Contains the spill as close as possible to the spill source. Recovery enables the spread of surface hydrocarbons to be reduced, thereby reducing the risk of impact to sensitive receptors. Removal of hydrocarbons from the marine environment.	Risks/ impacts from operation of vessel-based containment and recovery activities (e.g. liquid waste, air emissions from fuel usage, noise, marine fauna interaction, interference with other users, collisions, etc.). Equipment and labour intensive. Waste disposal of recovered condensate. Cleaning and disposal of contamination from	This strategy requires relatively calm conditions with currents speeds <0.5 m/s (<~1 knot). Requires slick concentrations >10 g/m^2.	No	Reject	Rejected given the evaporative and dispersive nature of the hydrocarbon. Weather conditions unlikely to permit efficient offshore containment using booms, weirs and skimmers. Surface concentrations >10 g/m^2 remain offshore. Zero probability of floating oil > 10 g/m^2 in	No	Reject	Weather conditions unlikely to permit efficient offshore containment using booms, weirs and skimmers. Surface concentrations >10 g/m^2 remain offshore. Zero probability of floating oil > 10 g/m^2 in MNP, State Waters or Nearshore Waters.

RESPONSE STRATEGY	ENVIRONMENTAL BENEFIT(S)	POTENTIAL ENVIRONMENTAL IMPACTS / RISKS	FUNCTIONAL/OPERATIONAL CONSTRAINTS	CONDENSATE			MDO		
				RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION	RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION
		booms and response vessels.				MNP, State Waters or Nearshore Waters.			
Shoreline Protection and Deflection	If modelling predicts impacts to sensitive receptors, then near-shoreline deployment of booming equipment can be undertaken to protect target receptors and to deflect to lower priority areas.	Risks/ impacts from operation of vessel-based protection and deflection activities (e.g. liquid waste, air emissions from fuel usage, noise, marine fauna interaction, interference with other users, collisions, etc.). Habitat disturbance from securing booms on shallow nearshore benthic environments. Generation of waste from booms and disposal of recovered condensate and water. Potential impacts to intertidal areas if deflected to low sensitivity shorelines.	Wind and surface currents are key constraint in the deployment and operations of booms in nearshore coastal environments. Considerable resources and logistics support needed (i.e., equipment and labour intensive). Site constraints such as breaking waves, etc.	Yes	Primary	Considered a primary response option as modelling predicts shoreline impact. Application, location, and tactics required will depend on the nature and scale of the incident at the time of the response.	Yes	Primary	Considered a primary response option as modelling predicts shoreline impact. Application, location, and tactics required will depend on the nature and scale of the incident at the time of the response.
Shoreline Clean-Up	Hydrocarbon removal from shorelines to minimise impacts to marine fauna and flora that may use shorelines: Reduced visual impact. Reduces risk of marine fauna contact and smothering effects. Reduce risk of re-entrainment of hydrocarbons from shoreline back into marine environment.	Potential shoreline disturbance to sensitive habitats (e.g. turtle nesting beaches) from clean-up operations (trampling by response personnel and equipment). Waste from removal of contaminated sediment from beaches and impacts to associated flora and fauna during removal activities.	Labour intensive, significant logistical planning, including waste management considerations required. Personnel management and coordination to reduce environmental and safety risks/impacts. Applicability is influenced by shoreline characteristics (substrate type, beach type, exposure to wave action, biological, social, heritage or economic resources, amount of hydrocarbon present and access to site). In the event of shoreline impact, appropriate shoreline clean-up tactics could be implemented to reduce the	Yes	Primary	Potentially feasible. The maximum length of actionable shoreline oil is approximately 7 km with initial shoreline contact predicted to occur within 3.5 days of the release, with a maximum loading of 28.1 m^2. Due to the nature of the gas condensate recovery from shorelines may be difficult and tactics	Partial	Secondary	Shoreline clean-up not considered feasible. Modelling does not predict shoreline impact at the actionable threshold (>100g/m^2), therefore, hydrocarbons not able to be removed. However, if monitoring indicates that shoreline impact will occur at the time of the response, Shoreline Clean-up Assessment Technique (SCAT), will still be

RESPONSE STRATEGY	ENVIRONMENTAL BENEFIT(S)	POTENTIAL ENVIRONMENTAL IMPACTS / RISKS	FUNCTIONAL/OPERATIONAL CONSTRAINTS	CONDENSATE			MDO		
				RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION	RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION
		Temporary storage of waste has the potential to cause contamination to areas not originally contacted by the spill. Presence of response personnel, equipment and facilities will increase the risk of hydrocarbon cross contamination from an impacted site to a non-impacted site.	impact to the shoreline habitats and species. Actionable amount of shoreline accumulation > 100g/m^2			such as washing, flooding and flushing may be more effective.. Note: specific techniques to be decided following the completion of an operational NEBA in consultation with relevant stakeholders and under the direction of the relevant Control Agency.			required, and continued monitoring to ensure the threshold does not reach >100 g/m^2.
Oiled Wildlife Response (OWR)	Prevent impact to wildlife (e.g. onshore exclusion barriers, hazing, pre-emptive capture). Reduce impact to wildlife (e.g. collection and rehabilitation to treat oiled fauna and return to similar suitable habitat or to the cleaned habitat).	Risks/ impacts from operation of vessel-based oiled wildlife response activities (e.g. liquid waste, air emissions from fuel usage, noise, marine fauna interaction, interference with other users, collisions, etc.). Hazing could disrupt wildlife (e.g. separating parents/offspring pairs, deterrence to nesting grounds etc.). Potential risk of fauna injury and inappropriate field collection/ handling during pre-emptive capture and post-oiled collection. Rehabilitation activities could result in inadequate/ inappropriate animal	Labour intensive and significant logistics considerations. Wind is a key constraint, calm seas and ideal conditions are considered necessary for capture operations. Weather constraints for use of aerial observation/ tracking fauna. Navigation of multiple vessels within a small area. Availability of suitable space/ location in township for staging area and rehabilitation and fauna treatment areas. Utilisation of local skilled fauna handlers and veterinarians for treatment of oiled wildlife. Availability of an additional vessel for wildlife transport to rehabilitation centre	Yes	Primary	This response will be implemented as a primary response option as wildlife reconnaissance will be implemented as soon as practicable. The specifics tactics will be determined based on the nature and scale of the spill.	Yes	Primary	This response will be implemented as a primary response option as wildlife reconnaissance will be implemented as soon as practicable. The specifics tactics will be determined based on the nature and scale of the spill.

RESPONSE STRATEGY	ENVIRONMENTAL BENEFIT(S)	POTENTIAL ENVIRONMENTAL IMPACTS / RISKS	FUNCTIONAL/OPERATIONAL CONSTRAINTS	CONDENSATE			MDO		
				RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION	RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION
		husbandry leading to stress/ injury/ death. Inappropriate fauna relocation points leading to disorientation/ stress.							
Waste Management	Appropriate management of hydrocarbon-contaminated waste to reduce the potential for further contamination of the environment if not disposed of correctly.	Temporary storage and/or the inadequate disposal of waste has the potential to cause contamination to areas not originally contacted by the spill (secondary contamination). Risks / impacts from transport of wastes via vessels and/or land vehicle (air emissions from fuel usage, noise, fauna interaction, interference with other users, collisions, etc.).	Appropriate waste receptacles required for potentially large volumes of contaminated waste. Agreement in place with third-party waste contractor. Third-party contractor will develop a waste management plan and remain responsible for all waste removal activities.	Yes	Primary	Standard industry requirement. Any hydrocarbon contaminated wastes generated during a spill will be managed appropriately.	Yes	Primary	Standard industry requirement. Any hydrocarbon contaminated wastes generated during a spill will be managed appropriately.
Operational and Scientific Monitoring Bridging Implementation Plan (OSM-BIP)	By determining the potential ongoing environmental impact attributable to the spill or response activities, OSM-BIP ensures remediation activities are appropriate and well informed.	Risks/ impacts from operations of OSM-BIP include vessels and aircraft (e.g. liquid waste, solid waste from sampling, air emissions from fuel usage, noise, marine fauna interaction, interference with other users, collisions, etc.).	Access to water / sediment sampling locations due to weather, currents and spill constraints Visual observation activities at night or during poor weather restricted. Stringent safety management requirements for aerial and marine operations employed. Coordination of multiple vessels within limited area. Third-party contractor will develop an Operational and Scientific Monitoring Bridging Implementation Plan (OSM-BIP) and remain responsible for maintaining capability, equipment and resourcing and implementing the monitoring plans after activation from	Yes	Primary	Standard industry requirement. This primary response to be implemented once initiation criteria have been triggered.	Yes	Primary	Standard industry requirement. This secondary response to be implemented once initiation criteria have been triggered.

RESPONSE STRATEGY	ENVIRONMENTAL BENEFIT(S)	POTENTIAL ENVIRONMENTAL IMPACTS / RISKS	FUNCTIONAL/OPERATIONAL CONSTRAINTS	CONDENSATE			MDO		
				RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION	RESPONSE APPLICABILITY BASED ON HYDROCARBON TYPE PRESENT YES / NO / PARTIAL	PRIMARY / SECONDARY / NA / REJECT	JUSTIFICATION
			the Control Agency in the event of a spill event. Exchange of information will take place between the OSM-BIP contractor and the relevant control agency.						

6.1.2. Justification for Excluded Spill Response Strategies

Capping stack

The use of a subsea capping stack is not a feasible source-control option for the Judith-2 drilling program. The Judith-2 well is drilled using a jack-up rig fitted with a surface Blowout Preventer (BOP) system. This surface-based configuration means there is no subsea wellhead or subsea tree onto which a capping stack could be installed. Capping stacks are designed exclusively for subsea wellheads, typically associated with floating MODUs or subsea development wells. As no subsea wellhead exists for Judith-2, deployment is technically impossible.

As the option is technically infeasible, it cannot provide any reduction in environmental consequence and therefore cannot contribute to reducing impacts and risks to ALARP. Relief-well capability is instead maintained as the only viable permanent source-control measure for a Loss of Well Control event. This approach ensures that feasible, effective controls are implemented, and that resources are not directed toward measures that would not reduce risk.

Based on these factors, a capping stack is assessed as Not Applicable for the Judith-2 activity, and no additional commitments relating to capping stack mobilisation, storage, deployment or testing are required.

Surface Dispersant

Surface dispersants have been evaluated and rejected for both hydrocarbon scenarios based on the following specific factors:

- Condensate (LOWC): Classified Group I non-persistent oil with a 64% volatile fraction. Rapid evaporation within the modelled environmental conditions eliminates sufficient surface persistence for dispersants to achieve a net environmental benefit. The strategic NEBA (EP Section 6.1) confirms this outcome.
- MDO (vessel fuel rupture): Classified Group II light persistent oil released as a single instantaneous event of 280 m^3. The limited volume, combined with offshore location and prevailing sea conditions, means the environmental return from mobilising dispersant stockpiles and aircraft is grossly disproportionate to the cost. Natural recovery with surveillance monitoring provides the superior net benefit.

In preparation of this EP and OPEP, Emperor Energy considered whether dispersant use in Commonwealth waters could result in sub-surface dispersed oil being transported into Victorian or Tasmanian State waters, consistent with NOPSEMA's requirement to consult with relevant State/Territory jurisdictional authorities where this pathway exists.

Based on the condensate weathering profile (64% volatile fraction, non-persistent Group I classification) and the MDO spill volume (280 m^3, Group II light persistent), surface dispersants have been excluded from use for both scenarios. In the absence of dispersant use as a planned response strategy, sub-surface dispersed hydrocarbon transport to State waters is not a planned response hazard for this activity.

Subsea Dispersant Injection (SSDI)

Subsea Dispersant Injection (SSDI) has been assessed for the Judith-2 drilling program and is determined to be technically infeasible and operationally unsuitable. SSDI requires the presence of a subsea wellhead or blowout preventer (BOP) stack that can interface with subsea injection hardware. The Judith-2 activity is undertaken using a jack-up rig with a surface BOP system, meaning all pressure-control equipment is located above the waterline. Because there is no subsea wellhead, no access point exists for injection wands or subsea dispersant manifolds. As a result, deployment of SSDI is not technically possible.

Even if SSDI were technically feasible, the released hydrocarbon type (light gas-condensate) does not respond effectively to dispersant application. Condensate rapidly volatilises and naturally disperses into the water column, limiting the presence of thicker surface or subsea plumes that dispersants are designed to treat. Industry guidance notes that very light, low-viscosity hydrocarbons provide minimal surface residence time for chemical interaction, reducing potential environmental benefit.

As SSDI cannot be physically deployed and offers no meaningful reduction in environmental consequence for condensate releases, it does not meet the criteria for a reasonably practicable control. The exclusion of SSDI allows focus on effective, implementable source-control measures, including timely relief-well capability. Therefore, the decision not to adopt SSDI is justified on the basis of both technical infeasibility and lack of environmental benefit.

Containment and Recovery Rejection

At-sea containment and recovery has been evaluated against ALARP principles and rejected from both spill scenarios on the following basis:

- Condensate (LOWC): The condensate is a non-persistent Group I oil with a 64% volatile fraction. Boom deployment and skimmer operations in the Gippsland Basin at water depths of ~76 m in offshore conditions present practical operating limits that render effective containment infeasible before natural dispersion occurs. Recovery efficiency from best available offshore skimming equipment under these conditions is modelled at 5-10%. The cost of pre-positioning, mobilising and operating containment and recovery assets for this scenario is grossly disproportionate to the negligible environmental benefit achievable.
- MDO (280 m^3 vessel release): the limited volume and instantaneous release character of this scenario, combined with the Group II light persistent classification of marine diesel oil, results in a slick that is predicted to rapidly spread and weather. Diesel forms very thin surface films, exhibits high evaporation rates, and disperses rapidly offshore, resulting in slick thicknesses below the effective operating range of conventional offshore booms and skimmers. Booming and skimming are therefore not considered effective response measures. Offshore boom deployment at the operational location would require significant logistical complexity, cost and safety exposure for negligible incremental recovery. The sacrifice associated with mechanical recovery is grossly disproportionate to the limited environmental benefit when compared with the natural recovery and surveillance monitoring strategy already in place.

6.2.Spill Response Strategies

Spill response strategies relevant to the Judith-2 activities have been identified based on the evaluation in Table 6-1, the volume and location of recoverable hydrocarbons (as outlined in Section 1.5 of the OPEP), the strategic NEBA in Section 4.2.1 of the OPEP and operational NEBA processes (undertaken in the event of an incident) to ensure that response actions provide a net environmental benefit and are reasonably practicable. The Judith-2 response framework includes offshore, nearshore, and shoreline strategies supported by dedicated surveillance, modelling and scientific assessment to ensure real-time situational awareness.

The following subsections summarise the purpose, function, capability arrangements, and ALARP justification for each spill response strategy applicable to the Judith-2 drilling activity. Detailed response procedures, equipment specifications, and mobilisation pathways are documented in Section 5 of the OPEP and will be applied during incident management and operational decision-making.

6.2.1. Source Control

For a vessel collision, the source control tactics to limit the volume of hydrocarbons released include:

- Vessel source control

Vessel source control actions are those in accordance with the vessel's SOPEP and dependent on the scenario type. It may include transfer of the fuel from the damage tank and repairing the damage tank.

Source control tactics for a LOWC scenario for consideration to stop, control or limit the volume of hydrocarbon spilt, in this plan include:

- Relief Well

If the BOP has failed to prevent hydrocarbons being released in the event of a LOWC, the drilling of a relief well provides an opportunity to permanently suspend the well. A relief well is drilled to intersect the compromised wellbore above the blowout location. Weighted drill fluid is pumped down the relief well at high rates to kill the existing well. This requires the mobilisation of another suitable MODU to the existing well location.

Two relief well designs were developed for Judith-2, one based on a blowout from the 12-1/4" section (Figure 6-1) and one based on 8-1/2" section (Figure 6-2). The conceptual well trajectories are shown below, based on a 600m offset for Judith-2.

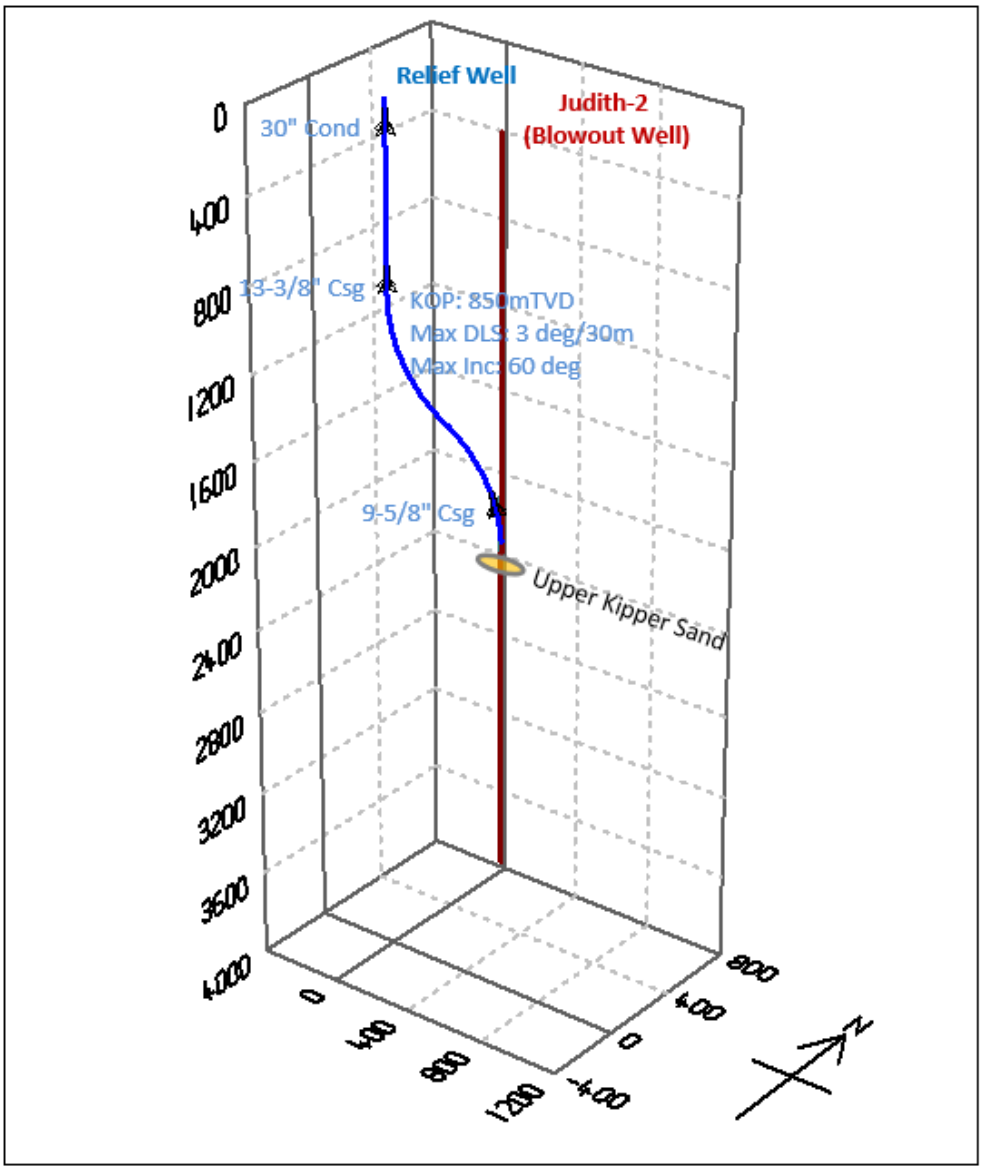


Figure 6-1: Relief Well for Blowout in 12-1/4" section

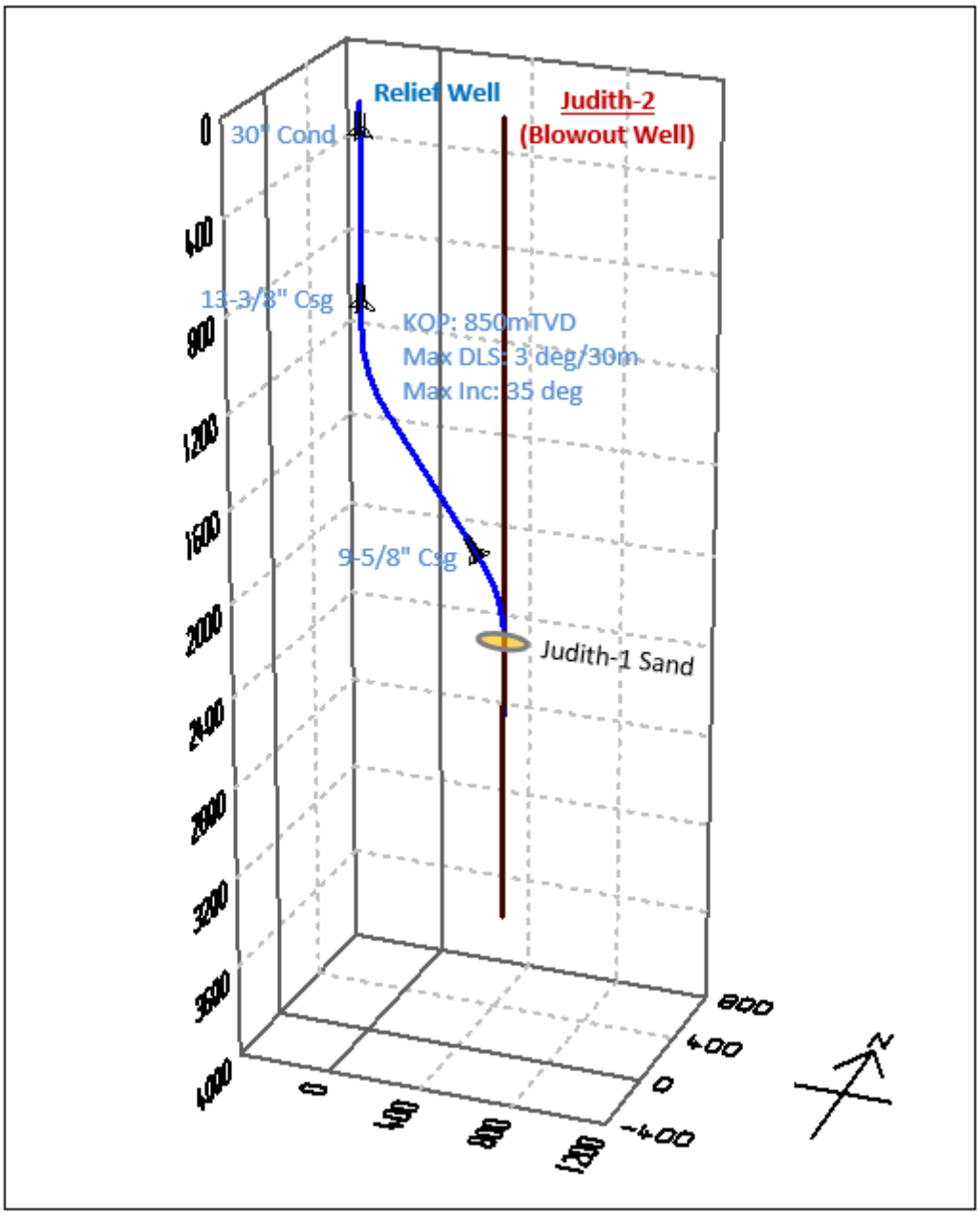


Figure 6-2: Relief Well for Blowout in 8-1/2 section"

Worst Case Discharge:

As described in Section 5.9.2.1, WCD for Judith-2 well were assessed in both Schlumberger (2022) and at the revised well location (AGR, 2025) with differences between flow rates and discharge volumes in the studies summarised in Section 5.9.2.

The results of the 2025 modelling are:

- Day 1 worst case discharge rates were modelled at 496 MMscf/day of gas and 4960 stb/day condensate for a CGR of 10 stb/MMscf.
- The depleted flow rate after 77 days is 381 MMscf/day gas and 3,810 stb/day condensate.
- Approximately, 333,774 stb of condensate and 33.3 Bscf of gas could be expelled within 77 days during the blowout.

MODU Selection Process:

MODU Mobilisation:

Once it is identified that a relief well MODU is required, the MODU operators identified prior to spud would be approached, in accordance with the AEP MoU, to secure their well and release the MODU for relief well drilling.

From this point onwards, a number of parallel activities would be kicked off, including gaining a safety case, mobilising relief well equipment and mobilising the MODU to location. Worst case, it is assumed the MODU would come from the Northwest Shelf, Western Australia.

Safety Case Revision Approval:

Considering approvals, the Safety Case Revision (SCR) will be critical path as it involves preparation, submission and approval prior to operations commencing. Gaining SCR is expected to take 4 weeks (preparation, submission and approval) and will be undertaken concurrently with other planning and mobilisation tasks.

Drilling Timing:

The discharge modelling assumed in the hydrocarbon spill modelling report (RPS, 2022) assumed a conservative 77 days, which is greater than the total time to relief well drilling.

Once the MODU is on location is it estimated that it would take approximately 36.4 days to drill, intercept and kill the well. A breakdown of this timeline is shown in Table 6-2.

Table 6-2: Indicative timing for Relief Well Drilling

RELIEF WELL DRILLING	DAYS (CUMULATIVE)	DAYS (INTERVAL)
Mobilising a MODU to location, obtain approvals	30.00	30.00
Position MODU on location and prepare for spud	34.24	4.24
Drill 36" x 26"-hole section	34.73	0.49
Run & cement 30" x 20" conductor	35.97	1.24
Drill 17-1/2" hole section to casing depth	37.95	1.98
Run & cement 13-3/8" casing	39.20	1.25
Install wellhead and nipple up surface BOP	41.02	1.82
Drill 12-1/4" hole section to casing depth	46.80	5.78
Run & cement 9-5/8" casing, test surface BOPs	49.23	2.43
Drill out 9-5/8" shoe	50.04	0.81
Allowance for ranging, intercept and well kill	67.04	17.00

Total	67.04

In total, mobilising a MODU to location (including all required approvals) is expected to take 30 days. In combination with the relief well drilling time described in Table 6-2, this gives a total time to well kill as 67 days.

Source Control Response Arrangements

Emperor Energy has in place contracts/agreements with specialist resources to supply well control expertise and support for drilling a relief well are secured prior to spud.

This includes:

- Well engineering support (AGR).
- Well control specialists with experience in relief wells (WWC).
- Wellhead (TFMC) and casing materials supplier (BOMA Australia).

Emperor Energy is party to the Industry Memorandum of Understanding (MoU) to share drilling rigs, equipment and resources in the event of an emergency. The MoU provides for the timely transfer of third-party contractual arrangements involved in the release of a MODU and well site services to the Titleholder for relief well drilling.

Equipment and materials needed to construct a relief well will be able to be sourced either directly from suppliers or through the industry AEP Mutual Aid MoU.

6.2.2. Surveillance, Modelling and Visualisation

Surveillance, Modelling and Visualisation (SMV) activities provide real-time information on spill location, extent, trajectory, hydrocarbon behaviour, weathering, and potential interactions with sensitive receptors. This situational awareness enables both the Crisis Management Team (CMT) and the Incident Management Team (IMT) to make informed tactical decisions, adjust response strategies, and initiate protective actions early, thereby reducing the likelihood and consequence of environmental impacts. The SMV tactics that may be used to evaluate the parameters and potential trajectory of the spill may include:

- Initial hydrocarbon characterisation – using vessels and sampling equipment to obtain samples of the released hydrocarbon for laboratory analysis of its physical and chemical properties at the time of release.
- Hydrocarbon fate and weathering modelling – computer modelling, and computational techniques estimate the weathering of a hydrocarbon type.
- Oil Spill Trajectory Modelling (OSTM) – computer models, and computational techniques estimate the speed and direction of movement, weathering, and dispersal patterns.
- Visual Surveillance (aerial/vessel) – observers on aircrafts or vessels use standard references to characterise surface oil type, movement and behaviour.
- Satellite Imagery Observation – a method that uses remote sensing technologies to identify and track surface oil. Can be accessed through the relevant contractor company.
- Tracking buoys – are heavy duty floating devices designed for deployment from MODUs, support vessels and helicopters to accurately track a surface hydrocarbon spill. Tracking buoys contain a global

satellite tracking system and are used to track the leading edge or centre of a spill and provide an spill response team with information to plan the incident response.

Emperor Energy will maintain contracts for helicopter and fixed-wing services that can be activated during an incident to support SMV activities. Tracking buoys can be deployed from the JUR or support vessels, and satellite imagery will be sourced through contracted providers. AMOSC associate membership will ensure access to industry-standard monitoring equipment and trained personnel if required.

SMV outputs will feed directly into the Incident Action Plan (IAP) cycle, enabling rapid reassessment of priorities and ensuring that applied response strategies remain effective and proportionate. Information collected through SMV also supports activation triggers for shoreline assessment teams, wildlife responders, and scientific monitoring programs

SMV is assessed as a primary and essential spill response strategy. The controls associated with SMV are reasonably practicable, effective, and consistent with good industry practice. Without SMV, other response strategies cannot be targeted effectively, which would increase environmental risk. Accordingly, the implementation of SMV is required to reduce impacts and risks to ALARP.

6.2.3. Shoreline Protection and Deflection

Shoreline Protection and Deflection will be implemented when modelling or SMV activities indicate a credible risk of hydrocarbons contacting sensitive shoreline habitats, as outlined in Section 5.9.2.5.

Protection and deflection booming aims to prevent or reduce the volume of hydrocarbons reaching high-priority shoreline receptors. By intercepting and redirecting floating hydrocarbons, the strategy reduces the potential for smothering, contamination, and long-term habitat disturbance. This control acts on consequence reduction by limiting the area and severity of shoreline impact. These tactics are typically used to protect smaller, high priority sections of shoreline. Shoreline protection will be considered when:

- spill modelling or operational NEBA indicates a risk of shoreline exposure,
- SMV confirms hydrocarbon movement toward sensitive coastal receptors, or
- a Control Agency directs shoreline protection operations.

Spill modelling undertaken as part of this assessment indicates that if a worst-case spill were to occur as a result of the Judith-2 exploration drilling activity, shoreline contact would occur and therefore the protection and deflection of shorelines is likely to be required, further assessment of where this shoreline contract may occur and the reasonable deployment of shoreline protection and deflection is undertaken in Section 6.3.1.

Shoreline Protection Teams will form part of the incident organisation under the relevant Control Agency.

Emperor Energy will maintain AMOSC associate membership, which provides access to shoreline protection equipment, trained personnel, and deployment vessels. Additional shallow-draft vessels can be mobilised through Emperor Energy's maintained list of regional vessel providers. Booming equipment used for protection and deflection includes inflatable and foam-filled boom types suitable for near-shore environments and anchoring gear.

Techniques vary depending on the location and type of sensitivity being protected. The requirement for response personnel to access the shoreline (i.e. via foot, vehicle, vessel) to be protected, and the implementation of an anchoring system for the nearshore booms (i.e. on the shoreline and / or in the nearshore environment) will cause a potential impact to the environment.

6.2.4. Shoreline Clean-up

Shoreline clean-up reduces environmental consequences by removing stranded hydrocarbons from intertidal and supratidal habitats, thereby reducing the potential for smothering, contamination, chronic exposure, and re-mobilisation of hydrocarbons back into the marine environment. This strategy directly limits the duration and severity of shoreline impacts and reduces risks to fauna using coastal habitats.

Shoreline Clean-up Assessment involves the deployment of personnel to relevant shorelines to identify response priorities, access points, and techniques required. Shoreline clean-up techniques consist of different manual and mechanical recovery techniques to remove oil and contaminated debris from the shoreline to reduce environmental impact from hydrocarbons. Resourcing and equipment details are provided in the OPEP.

Shoreline operations will be under the direction of the relevant Control Agency. The Control Agency is determined based on the source of the spill and whether the spill takes place in Commonwealth or State waters. Control Agencies for the spill scenarios considered for the activities within this EP are outlined in Section 3 of the OPEP.

The shoreline techniques which may be required to complete a shoreline clean-up response include:

- Natural recovery – no intervention i.e. allowing shoreline to clean itself (surf washing).
- Manual collection of oil and debris – use of personnel (e.g. shovels, rakes).
- Mechanical collection of oil and debris – use of machinery.
- Flushing– use of high-pressure (on artificial substrate only) and low-pressure water flushing techniques to wash stranded or buried oil from shorelines.
- Recovery – use of specialist equipment (e.g. skimmers, pumps, vacuums) to recovery floating oil.
- Vegetation clearing – removal contaminated vegetation.
- Cleaning agents – application of chemicals to remove oil (often only applicable for artificial substrates).

Clean-up will be initiated when:

- hydrocarbons accumulate on the shoreline above actionable thresholds (> 100g/m^2)
- operational NEBA confirms that clean-up provides a net environmental benefit, or
- the relevant Control Agency directs shoreline clean-up operations.

Emperor Energy's AMOSC associate membership will ensure access to trained shoreline responders, equipment, and waste-handling capability. Additional labour and local contractors may be mobilised as required based on shoreline length, access, and the scale of intervention.

Clean-up feasibility is influenced by shoreline access, weather conditions, tidal variation, public safety, and potential impacts arising from response personnel, vessels, and machinery. Inappropriate or overly aggressive clean-up techniques may cause more damage than the hydrocarbons themselves; therefore, all activities will be proportionate and environmentally sensitive.

Shoreline clean-up priorities will be reviewed during each operational period using updated SMV, SCAT inputs, and sensitivity mapping. The Control Agency will determine geographic priorities, resource allocation, and waste management pathways. Continuous monitoring will evaluate the effectiveness of clean-up methods and will inform the scaling up, modification, or demobilisation of operations.

The results of the OSTM predict that shoreline loading above the actionable threshold (of 100 g/m^2) could occur at isolated sections of the east Gippsland shoreline, as illustrated in Section 1.5 of the OPEP.

6.2.5. Oiled Wildlife Response

Any release of oil into the marine environment has the potential to impact wildlife. The level of oiled wildlife response (OWR) will be determined by data collected via initial Monitor and Evaluate response. OWR reduces environmental consequences by preventing, minimising, or mitigating oil exposure to wildlife. This is achieved through reconnaissance, deterrence (hazing), pre-emptive capture, and rehabilitation of oiled fauna. These actions directly limit injury, stress, mortality, and long-term ecological effects.

Wildlife response will be undertaken under the direction of the relevant State agency, which holds responsibility for wildlife operations and provides trained personnel, veterinarians, and facility oversight.

Emperor Energy's AMOSC membership ensures access to specialist wildlife equipment, while additional support (providing labour, logistics assistance, and resources) can be mobilised from recognised wildlife rescue organisations if required. Wildlife rehabilitation facilities may be established near staging areas or at existing regional facilities, depending on the species affected and the scale of the incident.

OWR can typically be separated into three stages, these include:

1) Wildlife Reconnaissance - situational awareness / visual observations of species present and identification of species that may potentially be impacted by vessel, aircraft, vehicle, AUV, or foot.
2) Preventative Actions – deterrence strategies (i.e. hazing), displacement strategies (i.e. fencing), and pre-emptive capture (translocation of wildlife prior to oiling)
3) Wildlife Rescue – capture, triage, cleaning, rehabilitation and release.

Wildlife response activities form part of the broader IMT structure and are coordinated with shoreline, SMV, and scientific monitoring teams. OWR priorities will be reviewed during each operational period using updated SMV findings, SCAT assessments, predator/prey information, and seasonal sensitivity mapping. Ongoing monitoring of wildlife presence, behaviour, and health will guide adjustments to tactics and resourcing.

6.2.6. Waste Management

Hydrocarbon spills to the marine environment can generate significant amounts of waste, hence a waste management strategy will be implemented to ensure that all waste generated during spill response activities is collected, stored, transported, and disposed of in a manner that prevents secondary contamination of the environment. Effective waste management prevents hydrocarbons and contaminated materials from being re-introduced into the environment. It ensures that all contaminated debris, sediment, sorbents, PPE, wildlife waste, and recovered oil/water mixtures are handled in compliance, with MARPOL 73/78 Annex V – Garbage and relevant Commonwealth and State/Territory laws and regulations. This control reduces the potential for secondary pollution, cross-contamination, and prolonged environmental impacts.

Due to the light and high volatility nature of both hydrocarbon types (MDO and condensate), and their subsequent susceptibility to weathering processes (i.e. evaporation), combined with the low predicted shoreline impact. modelling predicts low quantities of recoverable hydrocarbons and therefore relatively small waste volumes. However, waste volumes may increase if shoreline clean-up or wildlife rehabilitation activities are required. Furthermore, containment and recovery has not been identified as a primary or secondary strategy for either the condensate or MDO scenario meaning the waste storage capacity required is likely to be very small.

Despite small waste volumes being predicted, the waste management arrangements will need to be reviewed to adapt to the response and ensure a continuous response can be maintained. Any resulting waste is likely to be transported by vessel from the spill response location to a nearby port. From there the waste will be transported to a licensed waste disposal facility by a dedicated waste contractor via controlled-waste-licensed vehicles in accordance with the relevant State regulations.

Emperor Energy maintains contractual arrangements with licensed waste management providers capable of receiving, handling, storing, and disposing of contaminated waste streams. AMOSC membership provides access to temporary storage infrastructure such as portable bins, lined skip containers, and intermediate bulk containers (IBCs) suitable for contaminated materials.

Temporary waste storage areas will be selected at the time of the incident based on accessibility, environmental sensitivity, security, and available space. Pre-establishing storage sites is not practicable due to approval requirements and the event-specific nature of waste volumes and shoreline locations. Where possible, existing commercial waste facilities or council depots will be used to avoid unnecessary disturbance to sensitive shoreline environments.

Waste management operations will be coordinated through the Planning and Logistics functions of the IMT. Waste forecasts will be updated regularly based on SCAT reports, SMV findings, and OWR outputs. The Control Agency will determine prioritisation of waste removal activities and ensure that waste handling aligns with response tactics and environmental protection objectives.

Waste management is reasonably practicable, industry standard, and essential for controlling secondary environmental impacts. The strategy is supported by licensed waste contractors, regulated transport processes, and scalable storage infrastructure. By preventing re-contamination and ensuring compliant disposal, waste management reduces impacts and risks to ALARP. Pre-positioning waste storage locations was assessed and rejected, as it does not provide proportional benefit and may create additional environmental disturbance, this is summarised in Section 6.2.6.

6.2.7. Operational and Scientific Monitoring Bridging Implementation Plan (OSM-BIP)

Operational and Scientific Monitoring is implemented to assess, track, and understand the environmental effects of a hydrocarbon spill and the response actions undertaken An Operational and Scientific Monitoring Bridging Implementation Plan (OSM-BIP) will be conducted on behalf of Emperor Energy by a contracted monitoring service provider.

The OSM-BIP will provide a structured framework for monitoring both the immediate and longer-term environmental impacts of a spill. Operational monitoring provides rapid, real-time data to support tactical decisions during the response, while scientific monitoring evaluates short- and long-term ecological effects and the need for remediation. Together, these monitoring streams reduce environmental risk by ensuring that impacts are identified early, managed appropriately, and tracked over time.

The OSM-BIP addresses the requirements of Regulation 22 (8) – 22(16) of the OPGGS(E) Regulations.

The OSM-BIP will be activated for Tier 2 or Tier 3 spills, as defined in the OPEP. Triggers include confirmed hydrocarbon release above threshold volumes, SMV detection of potential environmental exposure, and Control Agency direction. Once triggered, the OSM-BIP contractor will mobilise monitoring teams, charter vessels, laboratory capacity, and specialist equipment.

The OSM-BIP will compose of two types of monitoring which often occur in parallel depending on the initiation trigger for each:

- Operational monitoring - which will be implemented during the first strike response phase and continued throughout the response, will often be used to provide guidance to the IMT during the hydrocarbon response. Activities may include: water and sediment sampling, in-situ water quality measurement, shoreline reconnaissance, plume delineation, subsurface monitoring, and collection of biological indicators. Outputs feed directly into the Incident Action Plan (IAP) cycle and inform shoreline response, wildlife operations, and waste management prioritisation.
- Scientific monitoring - which is to be implemented during the recovery phase of the response and assesses the short- and long-term ecological impacts of the spill and response activities. This may include toxicity testing, benthic and pelagic community assessments, shoreline habitat recovery surveys, water quality analysis, and contaminant fate modelling. Results inform remediation objectives, endpoint determination, and the eventual demobilisation of response efforts.

The OSM-BIP is a strategic document and key component of the environmental management framework of this activity.

Emperor Energy maintains a contract with a specialist OSM-BIP service provider, who is responsible for maintaining equipment, laboratory access, and field-ready capability. AMOSC membership further ensures access to monitoring equipment and personnel if surge capacity is required. The OSM-BIP provider will coordinate through the relevant State Control Agency, to other scientific bodies, and waste and wildlife response teams throughout the monitoring period.

OSM-BIP outputs are incorporated into each operational period's IAP. Operational monitoring provides rapid feedback to adjust response tactics, while scientific monitoring informs medium- to long-term recovery planning. Regular briefings ensure that decision-makers are aware of emerging impacts, allowing response strategies to be modified to ensure net environmental benefit.

OSM-BIP is a required, industry-standard component of spill response and is reasonably practicable for the Judith-2 activity. The strategy provides clear environmental benefit through early detection of impacts, informed decision-making, and documented recovery assessment. Accordingly, implementation of OSM-BIP reduces impacts and risks to ALARP and is mandatory for significant spill scenarios.

6.3. Environmental Assessment of Spill Response Activities

The impacts and risks associated with vessel, aerial and MODU operations, undertaken to support oil spill response and source control activities, have been assessed in detail in previous EP sections, the strategic NEBA, and therefore are not repeated here.

This section assesses only those spill response strategies not previously assessed; these include risks from:

- Shoreline Response:
  - Protection and Deflection
  - Shoreline Clean-up
- Oiled Wildlife Response (OWR)

These emergency response activities may introduce the following risks to environmental receptors:

- damage and/or loss of shoreline habitats
- injury / mortality to fauna
- change in fauna behaviour

- change in ecosystem dynamics

6.3.1. Shoreline Response

A shoreline assessment has been completed for all identified shoreline contact points where hydrocarbons are predicted to come ashore Figure 6-3.

Shoreline clean-up is considered reasonably practicable where hydrocarbon accumulation exceeds actionable thresholds(>100 g/m^2) and where intervention is expected to provide a net environmental benefit compared to natural recovery alone. This approach is consistent with national guidance, established industry practice and AMOSC response frameworks. In areas where hydrocarbon concentrations are low, shoreline processes are erosion dominated, or habitats are highly sensitive to disturbance, natural recovery may represent the preferred response option.

Predictive modelling for the LOWC worst case scenario indicates that hydrocarbon loading exceeding 100 g/m2 are expected to occur predominantly on hard rocky substrates and sandy beach environments. Areas predicted to receive lower concentrations are considered suitable for natural recovery in the first instance. For the MDO scenario, approximately 613m of rocky shoreline may be affected. For the LOWC scenario shoreline accumulation is predicted along approximately 20.17km of rocky shoreline and 8.2 km of sandy shoreline.

These estimates are based on predictive oil spill trajectory modelling, which identifies potential zones of influence across credible spill scenarios rather than confirmed impact locations. To ensure response actions remain proportionate and environmentally appropriate, Emperor Energy will undertake an Operational Net Environmental Benefit Analysis (NEBA) during the initial stages of any response. The NEBA will integrate updated trajectory modelling, shoreline type sensitivity, operational feasibility, and expected response effectiveness to identify impacted areas and to prioritise shoreline protection and clean-up actions.

The Operational NEBA will also guide the application of shoreline protection and deflection strategies where these actions can be safely implemented and are likely to deliver a net environmental benefit. Where methods such as manual removal, low-pressure flushing or mechanical recovery are assessed as feasible and environmentally beneficial, they will be incorporated into the response strategy. Conversely, where intervention is unlikely to improve environmental outcomes or may result in greater disturbance than the hydrocarbons themselves, natural recovery will be adopted in accordance with national guidance.

To support this decision-making process, the East Gippsland Region Response Plan (EGRRP) has been developed in collaboration with AMOSC to provide a structured, risk-informed framework for shoreline response planning and execution. The EGRRP informs Incident Management Team (IMT) decision-making by identifying region-specific ecological, socio-economic and cultural sensitivities, defining priority shoreline areas, and establishing response actions and minimum resourcing requirements based on shoreline type and scale. The plan is informed by stochastic oil spill modelling and applies to approximately 220 km of the East Gippsland coastline, while also providing a scalable framework that may be applied to adjacent regions should modelling indicate broader impacts. The EGRPP forms part of the OPEP and is attached to the OPEP as an appendix.

Potential impacts associated with shoreline response activities, including assessment, protection, deflection and clean-up, will vary depending on the shoreline type, response method and local conditions. Sensitive receptors in the region include nearshore and estuarine habitats such as seagrass beds, as well as sandy beach environments. Response activities may result in localised habitat disturbance, temporary fauna displacement or short-term degradation of habitat quality. For example, vessel operations in shallow waters

may increase sediment disturbance, while anchoring systems used to secure booms may affect seagrass or estuarine vegetation.

The feasibility of shoreline protection measures will depend on sea state, wave energy, currents, shoreline morphology and the availability of safe access points. Tactical booming and protection plans will be developed during an incident using real-time information from Shoreline Assessment Teams. Anchoring systems will be selected to minimise habitat disturbance while maintaining operational effectiveness. While some localised vegetation disturbance may occur where existing access is unavailable or where protection systems must be positioned, impacts associated with response activities are expected to be highly localised and confined to areas immediately adjacent to response infrastructure. Based on the scale and nature of the credible spill scenarios assessed, these effects are expected to be of medium-term duration, with natural recovery typically occurring within months to approximately one year.

Booming and protection priorities will be informed by Operational NEBA outcomes, modelling results, environmental and cultural sensitivity mapping, and advice from relevant State agencies. Response effectiveness will be monitored through aerial surveillance, shoreline inspections and boom integrity checks where practicable. Selection of shoreline protection and clean-up techniques will consider shoreline type, substrate sensitivity, fauna presence, cultural values and other site-specific factors. Shoreline protection is considered a primary and reasonably practicable control where shoreline impact is predicted, and where it is technically feasible and provides a net environmental benefit, supporting reduction of environmental risks to ALARP.

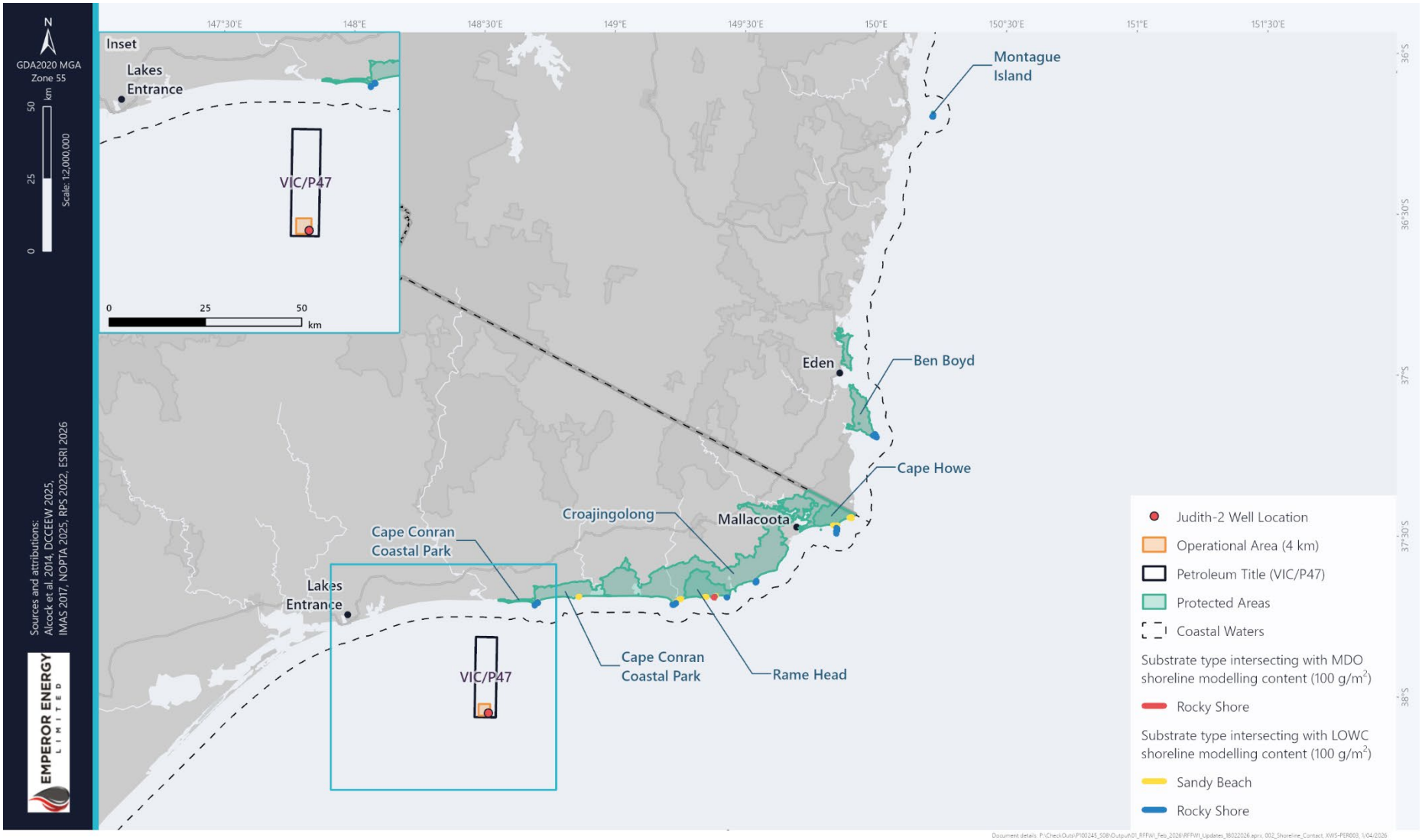


Figure 6-3: Shoreline locations predicted to receive shoreline hydrocarbon concentrations >100 g/m² from both LOWC and MDO scenarios

6.3.2. Oiled Wildlife Response

In the event that a OWR response is required, risks to fauna would predominantly be associated with the use of untrained resources to capture and handle the fauna potentially resulting in distress, injury or death.

OWR feasibility is influenced by species behaviour, sea state, weather conditions, seasonal factors, access to shoreline habitats, and availability of appropriate handling facilities. Improper capture or handling can cause additional stress or injury; therefore, all wildlife operations will be undertaken only by trained and authorised personnel. Public safety and biosecurity requirements will also be managed throughout operations.

To prevent these impacts, only DEECA (or other relevant state agencies) trained oiled wildlife responders will approach and handle fauna. This will eliminate any handling impacts to fauna from untrained personnel and reduce the potential for distress, injury or death of a species.

Hazing and exclusion of wildlife from known congregation, resting, feeding, breeding or nesting areas may have a short- or long-term impact on the survival of that group if cannot access preferred resources. These effects may be experienced by target and non-target species. For example, shoreline booming, or ditches dug to contain oil may prevent penguins from reaching their burrows after they've excited the water and low helicopter passes flown regularly over a beach to deter coastal birds from feeding in an oil-affected area may also deter penguins from leaving their burrows to feed at sea, which may impact on their health.

The consequence of spill response activities, shoreline response and oiled wildlife response) is assessed as Minor (2), with a likelihood assessed as Rare (1), with an overall risk ranking of Low (2), based on:

- Prevention controls are in place to prevent the risk of a LOWC event (see Section 5.9) and will subsequently reduce the risk of spill response activities being required.
- The hydrocarbon modelling report predicts that characteristics of MDO and gas condensate (light, low viscosity, and volatile) will result in a relatively large portion undergoing natural dispersion from weathering (i.e. evaporation), with only a comparatively small amount expected to persist within the environment, and reach shorelines, therefore reducing the amount of potential intervention required by the shoreline response.
- Sensitive receptors will be identified by the operational NEBA, ensuring mitigation measures are in place prior to the shoreline response activities are implemented.
- OWR will only be implemented where the operational NEBA determines a net positive outcome, and will be conducted using trained specialists, under the direction of the relevant Control Agency following the relevant State oiled wildlife plan.
- Shoreline response activities will be carried out in accordance with a NOPSEMA approved OPEP, under the guidance of the National Plan (AMSA 2020), using only trained responders to ensure they are compliant with industry best practice and Australian legislation and requirements.
- Impacts from shoreline response techniques are anticipated to only result in localised, medium-term impacts to species or habitats.

OWR is considered a primary and essential strategy for wildlife protection where fauna may be exposed to hydrocarbons. The strategy is reasonably practicable, supported by established State capability, consistent with national wildlife response frameworks, and delivers clear environmental benefit. Where hazing or capture may cause greater harm than potential oil exposure, tactics will be adjusted based on operational NEBA and expert guidance from the Control Agency. Accordingly, implementation of OWR reduces impacts and risks to ALARP.

6.4.ALARP Demonstration

Spill response activities for Judith-2 fall under an ALARP Type A decision context. This reflects that impacts and risks associated with spill response controls are well understood, industry standard, and routinely implemented across Australia's offshore oil and gas sector. There are no conflicts with company values, partner interests, or public expectations that would elevate the decision context.

6.5.Adopted Control Measures

To sufficiently define good practice the consideration of additional control measures has been assessed as part of defining the adopted control measures to support the Type A decision for oil spill response strategies.

The adopted controls (as listed in Table 6-3 of the EP) are based on recognised good industry practice, NOPSEMA-accepted arrangements, and the National Plan for Maritime Environmental Emergencies. These include: Source Control Emergency Response Plan (SCERP), the OPEP, the OSM-BIP, SMV capability, AMOSC membership, wildlife response arrangements, and access to waste management contractors. Collectively, these controls ensure that Emperor Energy can respond effectively, safely, and in a manner that reduces environmental impacts.

Table 6-3 lists the adopted controls to be used during the activity to reduce impacts from spill response activities to ALARP.

Table 6-3: Adopted Preventative and Response Controls

ADOPTED CONTROLS	SOURCE OF GOOD PRACTICE CONTROL MEASURES
CM39: SCERP	Source control capability is maintained in accordance with the SCERP. Source control response activities will be implemented in accordance with the SCERP. Developing a SCERP ensures that the titleholder has already planned how to stop the hydrocarbon release in the shortest possible time, meaning that a response can commence sooner than it otherwise would be.
CM27: NOPSEMA-accepted - OPEP	Emergency spill response capability is maintained in accordance with the OPEP. Emergency response activities will be implemented in accordance with the OPEP. The OPEP ensures that the titleholder has already planned how to respond to a hydrocarbon release, including allocating an adequate number of people and equipment, so that a spill can be responded to in a timely manner and environmental receptors can be protected.
CM28: OSM-BIP	Operational and scientific monitoring will be implemented in accordance with the OSM-BIP. The OSM-BIP ensures that the once a hydrocarbon spill has occurred, the environment is monitored to inform response activities under the OPEP and to accurately report impacts.

Additional potential controls in Table 6-4 were assessed for environmental benefit, feasibility, cost, and practicability. Controls such as standby drilling rigs, pre-drilling relief well top hole, pre-deployment of shoreline equipment, and pre-establishment of waste storage sites were rejected due to: lack of meaningful

impact reduction, technical infeasibility, environmental harm introduced by implementation, or gross disproportionality between the cost and the achievable environmental benefit.

Table 6-4: Additional Control Measures Considered

CONTROL	COST / BENEFIT ANALYSIS	CONTROL IMPLEMENTED
No spill response	Doing nothing eliminates potential impacts resulting from spill response strategies. while it avoids impacts associated with response activities, it does not support achieving net environmental benefit under NEBA principles and could result in unmitigated impacts if scenarios conditions differ from modelled scenarios. Maintaining a proportionate suite of response capabilities will be retained to ensure the ability to intervene if monitoring indicates that doing so would reduce environmental impacts and risks to ALARP while still achieving net environmental benefit.	No
Source Control		
Source control support through the AEP MoU arrangement	Emperor Energy as a member of AEP is a signatory to AEP Mutual Aid MoU that provides access to emergency equipment including a MODU in a LOWC event. In addition to this, Emperor Energy maintains a list of rigs available in Australia that would be suitable to drill a relief well in the case of an emergency. Access to a suitable drilling rig is critical in limiting the volume of the spill and securing the well in the shortest possible duration and therefore limiting the impact on the environment. The overall benefit in LOWC response is considered reasonable.	Yes (CM39)
Relief Well Critical Equipment Availability and Supply Chain Readiness	Emperor Energy maintain a backup wellhead system and 30" conductor string, ensuring that these long lead components are immediately available if a relief well is required. Additional 13⅜", 9⅝" and 7" casing/liner strings, while not pre-purchased, are routinely stocked by established regional suppliers and can be sourced within short timeframes. Having access to such equipment means that relief well drilling can occur promptly, therefore minimising the spill volume into the marine environment.	Yes (CM45)
Pre-purchase or access agreement for relief drilling supplies, including long-lead	Pre-purchasing or securing access agreements does not provide a meaningful or proportionate reduction in relief well duration.	No

CONTROL	COST / BENEFIT ANALYSIS	CONTROL IMPLEMENTED
items e.g. casing, casing shoes and wellhead equipment	Pre-purchasing additional casing or liners does not offer a measurable reduction in blowout duration or associated environmental risk given they are readily available from existing service providers Implementing this control would introduce unnecessary cost, storage, logistics and maintenance obligations without delivering a proportional environmental benefit.	
Maintain contract with source control specialists	By maintaining a contract with a source control specialist, Emperor Energy will save time in the event of a LOWC as specialists can be quickly mobilised. Quick mobilisation of source control specialists reduces the amount of time to respond to a spill and can assist with limiting the volume of the spill to minimise impact to the environment.	Yes (CM39)
Capping stack	The Judith-2 well is drilled using a jack-up rig fitted with a surface Blowout Preventer (BOP) system. This surface-based configuration means there is no subsea wellhead or subsea tree onto which a capping stack could be installed. Capping stacks are designed exclusively for subsea wellheads, typically associated with floating MODUs or subsea development wells. As no subsea wellhead exists for Judith-2, deployment is technically impossible. As the option is technically infeasible, it cannot provide any reduction in environmental consequence and therefore cannot contribute to reducing impacts and risks to ALARP.	No
Standby drilling rig to undertake a relief well whilst exploration activities are undertaken.	Expedites commencement of relief well drilling, therefore reducing the spill volume released to the marine environment. Having a drilling rig on standby may reduce the time the relief well is drilled by about 34 days compared to the AEP MoU (this represents the time required to source and mobilise the MODU to location, as outlined in indicative timing for relief well drilling in Section 6.2.1). However, the additional cost for a standby drilling rig is substantial (approximately $34 million). Costs and trade-offs are considered grossly disproportionate given the low likelihood of a LOWC and adoption of the AEP MoU agreement.	No
Pre-drill relief well top hole	May reduce the overall time to drill the relief well by several days (see indicative timing for relief well drilling in Section 6.2.1), therefore reducing the spill volume released into the marine environment.	No

CONTROL	COST / BENEFIT ANALYSIS	CONTROL IMPLEMENTED
	Additional effort and time for pre-drilling activity at the well will incur significant costs as well as result in additional drill cuttings and discharges, and noise emissions regardless of if a LOWC were to occur. Costs and trade-offs are considered grossly disproportionate to the limited reduction in days it would take to drill a relief well.	
Subsea Dispersant	Subsea dispersant delivery reduces concentrations of volatile organic compounds (VOC) that reach surface. However, chemical dispersants are considered ineffective for gas-condensate hydrocarbon releases. Furthermore, the design of the Judith 2 well program using a JUR and a surface BOP system removes the capability for injection of subsea dispersant into a subsea wellhead.	No
Alternative Response Times for primary source controls	A decrease in primary source control response times would reduce concentrations of gas-condensate hydrocarbons released to the marine environment. However, alternative response times to a loss of containment such as a well kill skid are not considered as there is no deck space that would allow for this to be a viable control. , Capping stack as a source control above is not a viable option..	No
SMV		
Dedicated monitoring aircraft on standby	A standby aircraft would allow immediate response for spill monitoring, however the cost of maintaining a dedicated aircraft is very high. Emperor Energy will have a contract in place for helicopter and fixed wing services throughout the activity, that could be called upon to undertake monitoring as required. The cost of maintaining a dedicated onsite aircraft is disproportionate to the benefit as having a contract in place allows for immediate response time.	No
Satellite tracking buoys deployed from MODU / support vessel within 1 hour of spill	Tracking buoys collect data which informs initial planning to increase effectiveness of response, thereby increasing environmental benefit. Implementing this control does not involve a cost sacrifice and is practicable.	Yes (CM27)
Shoreline Protection and Deflection		
Implement protect and deflect sooner	Any equipment mobilised to site would need to be purchased by Emperor Energy. Most equipment proposed to be used (available via the various agreements) can only	No

CONTROL	COST / BENEFIT ANALYSIS	CONTROL IMPLEMENTED
by storing equipment at strategic locations	be mobilised in an emergency as it needs to be stored and available in strategic locations nationwide for the whole industry. Purchasing and storing such equipment would result in significant costs that are considered grossly disproportionate to the level of risk reduction achieved.	
AMOSC master service contract in place pre-mobilisation to ensure that equipment and personnel can be provided.	By ensuring that memberships and contractual arrangements are in place prior to mobilisation, Emperor Energy will be able to call of contracts immediately in the event of a spill, reducing the response time and potential environmental impacts. Having such contracts in place is standard industry practice.	Yes (CM27)
Maintain vessel provider list.	Emperor Energy will monitor small vessel availability in the Victoria region. Monitoring vessel availability will reduce the response time for emergency vessels to assist with spill response, thereby reducing the potential environmental impacts.	Yes (CM27)
Shoreline Clean-Up		
AMOSC master service contract in place pre-mobilisation.	By ensuring that memberships and contractual arrangements are in place with AMOSC prior to mobilisation, Emperor Energy will be able to call of contracts immediately in the event of a spill to ensure that equipment and personnel can be provided rapidly, reducing the overall response time and potential environmental impacts.	Yes (CM27)
Pre-deployment of shoreline protection	Pre-deployment of shoreline protection at identified sensitivities would reduce the deployment time following a LOWCs, thereby increasing the protection of environmental sensitivities. However, any possible positive environmental benefits would be accompanied by associated environmental hazards to shoreline flora and fauna, including un-necessary disturbance to foreshore vegetation during placement and attraction of vehicles and human traffic to sensitive areas Additionally, the shortest time to shoreline contact (at low threshold) is 70 hours (2.92 days) unmitigated, with a peak volume of 28m^3 for East Gippsland. The earliest potential shoreline contact still allows >48 hours for mobilisation and deployment even under conservative assumptions.	No

CONTROL	COST / BENEFIT ANALYSIS	CONTROL IMPLEMENTED
	Pre-deployment would incur recurring costs (inspection, monitoring, replacement due to degradation). Based on this, and the nature and scale of the activity being undertaken, the cost and environmental hazards considered disproportionate to the potential benefits.	
Oiled Wildlife Response		
OWR is undertaken by trained specialist personnel.	Emperor Energy has in place a master service agreement with AMOSC that includes access to trained specialist OWR personnel. AMOSC has in place surge capacity through its contract with Dwyertech and other wildlife response organisation to provide up to 73 wildlife personnel which is far in excess of what is required for a Emperor Energy worst case scenario and as detailed in the OPEP Table 10-2. State agencies will likely take control of a LOWC and work with AMOOSC to lead the oiled wildlife response, providing trained personnel, technical expertise and support as required. Responders will be given direction from the appropriate agency during an OWR. Use of trained personnel to implement OWR will increase efficiency of oil spill protection efforts and minimise unnecessary harm to wildlife.	Yes (CM27)
Waste Management		
Pre-position temporary waste storage locations.	In the event of waste storage locations being required, the location and requirements of each location will be specific to the spill event and cannot be predetermined. Pre-positioning sites risks placing storage areas in locations that may ultimately never be used and may be environmentally sensitive. Existing permanent waste facilities, commercial depots, council sites, or industrial yards can be used wherever possible, with temporary sites selected in real time based on shoreline trajectory, accessibility, environmental sensitivities, and capacity forecasts. This approach is consistent with national shoreline response doctrine and ensures that waste handling aligns with the actual operational need. In addition, pre-planned temporary waste storage locations require permits, landholder agreements, environmental approvals, and cultural heritage considerations, none of which can be secured without knowing the final site footprint or land use implications. Attempting to pre-approve multiple hypothetical sites introduces disproportional effort based on the nature and	No

CONTROL	COST / BENEFIT ANALYSIS	CONTROL IMPLEMENTED
	scale of the activities being undertaken and may not be accepted by relevant authorities. Pre-positioning materials or preparing sites ahead of time could also create unnecessary environmental disturbance, including vegetation clearing, soil compaction, fauna displacement, and increased vehicle access to otherwise undisturbed coastlines. This would conflict with the regulatory requirement that controls must avoid creating new environmental impacts unless they provide a clear environmental benefit.	

6.6. Acceptability Determination

The assessment outlined above confirms that the suite of adopted spill response controls represents the set of measures that are reasonably practicable for the Judith-2 activity. All effective controls that provide a net environmental benefit have been implemented, and no additional effective or practicable measures remain that would further reduce impacts. Table 6-5 details the acceptability assessment against the criteria listed in Section 2.7. Residual impacts and risks associated with spill response implementation are minor, localised, short-term, and reversible. Operational NEBA, SMV, SCAT assessments, and OSM-BIP monitoring ensure these impacts will be continually evaluated and that response tactics remain proportionate and environmentally justified. Residual risks therefore meet the EP's acceptability criteria and are reduced to ALARP.

Table 6-5: Acceptability Assessment

CRITERIA	DETERMINATION
To meet the principles of ESD	Based upon the risk assessment completed for this activity, potential risks from implementation of spill response strategies were assessed to have a residual risk ranking of Medium (4). This residual risk ranking is considered tolerable and has been demonstrated ALARP. Further, quantitative modelling has been undertaken to remove some of the scientific uncertainty associated with this aspect. As such, the activity is consistent with the principles of ESD.
Internal context	The proposed management of the impact is aligned with the Emperor Energy HSE Policy (APPENDIX A). Activities will be undertaken in accordance with the Implementation Strategy (Section 8).
External context	No objections or claims have been raised during stakeholder consultation regarding the implementation of spill response strategies.
Other requirements	Implementation of spill response strategies is to be managed in consideration with: • MO 91: Marine Pollution Prevention – Oil

CRITERIA	DETERMINATION
	• OPGGS(E) Regulations. The implementation of spill response strategies was not deemed to be inconsistent with relevant plans, conservation advice or recovery plans listed in Table 4-12, including: • South-east Marine Parks Network Management Plan 2025 (DNP, 2025) • National Recovery Plan for Marine Turtles in Australia (CoA, 2017a) • National Recovery Plan for white shark (CoA, 2013) • Conservation Management Plan for the Blue Whale (CoA, 2015a) • Conservation Advice for *Balaenoptera physalus* (fin whale) (TSSC, 2015b) • Conservation Advice for *Balaenoptera borealis* (sei whale) (TSSC, 2015c) • National Recovery Plan for the Australian Fairy Tern (*Sternula nereis nereis*) (CoA, 2020e) • National Recovery Plan for the Australian Painted Snipe (CoA 2022a) • Conservation Advice *Calidris ferruginea* (curlew sandpiper) (DoE, 2015a) • Conservation Advice for *Calidris acuminata* (sharp-tailed sandpiper) (DCCEEW, 2024d) • Conservation Advice for *Numenius madagascariensis* (far eastern curlew) (DCCEEW, 2023c) • Conservation Advice for *Calidris tenuirostris* (great knot) (DCCEEW, 2024e) • Conservation Advice for *Calidris canutus* (red knot) (DCCEEW, 2024f) • National Recovery Plan for Albatrosses and Petrels 2022 (CoA, 2022) • Wildlife Conservation Plan for Migratory Shorebirds – 2015 (DoE, 2015a) • Wildlife Conservation Plan for Seabirds (CoA, 2020c) Relevant legislative requirements that provide explicit actions against this aspect are detailed in Section 5.9.6. Relevant conservation advice or management plans that identify pollution as a threat but do not provide explicit requirements are not detailed below. Emperor Energy considers the adopted control measures as detailed in Section 6.5 will manage the potential impacts from this aspect to ALARP and acceptable levels.
Acceptability outcome	Potential impacts from implementation of spill response strategies are considered **Acceptable** having met all the acceptability criteria as detailed above. Implementing the adopted control measures listed in Section 6.5 will ensure the following EPOs will be met:

CRITERIA	DETERMINATION
	EPO12: Undertake oil spill response in a manner that will not result in additional impacts to marine environment, coastal habitat and oiled wildlife. By meeting the above EPOs, it will ensure potential risks will be at or below the defined acceptable levels.

7. CONSULTATION

7.1.Commitment to Regulatory Compliance

Emperor Energy is committed to early and open engagement with individuals or groups who may be affected by our activities or who have an interest in, or influence on, what we do. This section outlines the principles, regulatory context, and objectives that underpin our approach to consultation for the Judith-2 EP.

In support of this EP, Emperor Energy has implemented a consultation process that meets the requirements of the OPGGS(E) Regulations. Specifically we have sought to:

- Identify relevant persons as defined in regulation 25(1) of the OPGGS(E) Regulations
- Provide each relevant person sufficient information to allow the relevant person to make an informed assessment of the possible consequences of the activity on their functions, interests or activities as per regulation 25(2) of the Environment Regulations
- Allow each relevant person a reasonable period for consultation as per regulation 25(3) of the OPGGS(E) Regulations, which is generally a minimum of 30 days, with flexibility for extended timeframes where appropriate
- Advise each relevant person of confidentiality rights, should they request that particular information provided not be published, and take reasonable steps to ensure information subject to such a request not be published as per regulation 25(4) of the OPGGS(E) Regulations
- Capture in its report on consultation, as per regulation 24(b) of the OPGGS(E) Regulations, the following:
    - A summary of each response made by a relevant person; and
    - an assessment of the merits of any objection or claim about the adverse impact of each activity to which the environment plan relates; and
    - a statement of the titleholder's response, or proposed response, if any, to each objection or claim; and
    - a copy of the full text of any response by a relevant person.
- Engage relevant persons in a way that is appropriate to their interests, cultural considerations and information needs.
- Provide feedback to relevant persons on any objections or claims they may have raised, and outline measures adopted in response to consultation with that relevant person.
- Ensure appropriate ongoing consultation with relevant Commonwealth and state authorities and other relevant interested persons or organisations as per regulation 22(15) of the OPGGS(E) Regulations as part of the implementation strategy. This is described in Section 7.9.

Beyond regulatory compliance, Emperor Energy's consultation process aims to:

- Build trust and maintain transparent relationships with stakeholders
- Incorporate local knowledge and stakeholder insights into environmental risk management
- Support the principles of ESD by considering environmental, social, cultural and economic factors
- Facilitate a two-way dialogue that respects stakeholder perspectives and promoted inclusivity

In addition to consultation undertaken during the preparation of this EP, Emperor Energy recognises that consultation is an ongoing obligation that extends through the assessment, acceptance, and implementation phases of the EP and is committed to maintaining meaningful and ongoing relationships with relevant stakeholders. Consultation arrangements are therefore designed to support both the development of the EP and the ongoing management of impacts, risks, and stakeholder interests throughout the lifecycle of the activity. Section 7.9 provides further detail on Emperor Energy approach to the management of stakeholder engagement and feedback on an on-going basis.

7.2. Alignment with Case Law and Best Practice

This approach reflects recent Federal Court decisions and case law, including:

- *Santos NA Barossa Pty Ltd v Tipakalippa*, [2022] FCAFC 193 (appeal decision)
- *Cooper v NOPSEMA* (No 2), [2023] FCA 1158
- *Munkara v Santos NA Barossa Pty Ltd* (No 3), [2024] FCA 9

Which emphasise that consultation must be genuine, adapted to stakeholder needs, and provide sufficient time and information for informed feedback. It also aligns with NOPSEMA's guidance on consultation, which advocates for transparency, accessibility, and responsiveness throughout the EP development process.

This introduction establishes Emperor Energy's commitment to comprehensive, meaningful consultation and sets the foundation for the detailed methodology and stakeholder identification processes described in the following sections.

7.3. Relevant Person Identification

Emperor Energy has adopted a multi-layered methodology consistent with approaches used by combining geospatial analysis, regulatory guidance, stakeholder verification, and benchmarking against relevant publicly available EPs from the region to ensure comprehensive identification of relevant persons.

Central to this process is the development of a Socio-Economic EMBA, which overlays hydrocarbon exposure thresholds defined by NOPSEMA with socio-economic and cultural sensitivities. Error! Reference source not found. reflects a LOWC worst-case scenario and is used to identify potential impact zones beyond the immediate operational area.

The Socio-economic EMBA is a geospatial representation of the areas represented by the hydrocarbon thresholds defined by NOPSEMA. This would reflect a worst-case scenario through a Loss of Well Control unplanned event.

This approach ensures that consultation extends to stakeholders whose interests may be indirectly affected, supporting a precautionary and inclusive interpretation of Regulation 25 obligations.

The original Socio-Economic EMBA was developed based on thresholds detailed in NOPSEMA's Oil spill Modelling Environmental Bulletin (A652993) (NOPSEMA 2019). Since the original development of the Socio-Economic EMBA, NOPSEMA has published revised thresholds in information paper Application of Oil Spill Modelling in Environment Plans (A1289237) (NOPSEMA 2025). These thresholds are detailed in (

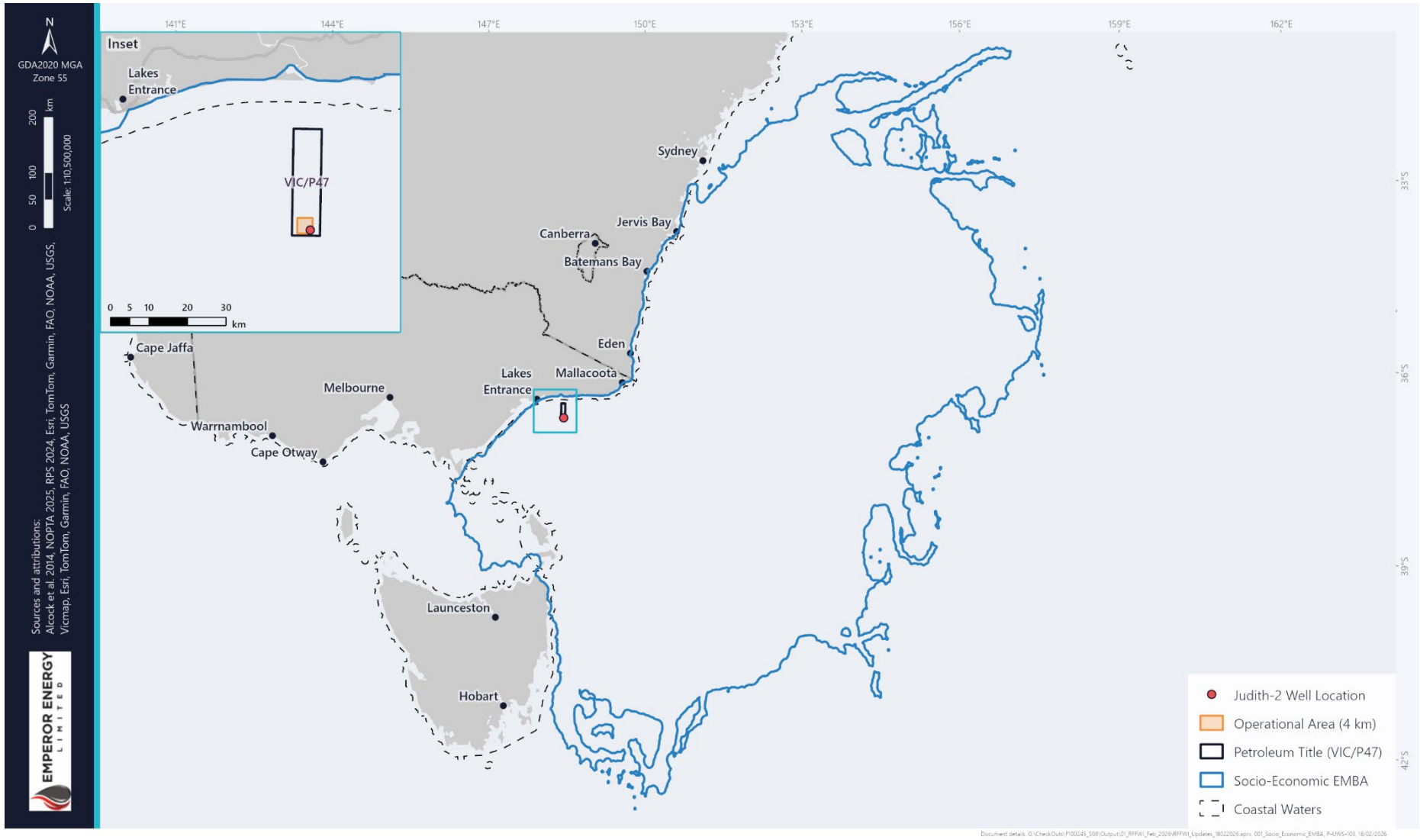


Figure 7-1: Judith-2 Well Socio-Economic EMBA

Table 7-1). The resulting revised Socio-Economic EMBA did not identify any additional relevant persons.

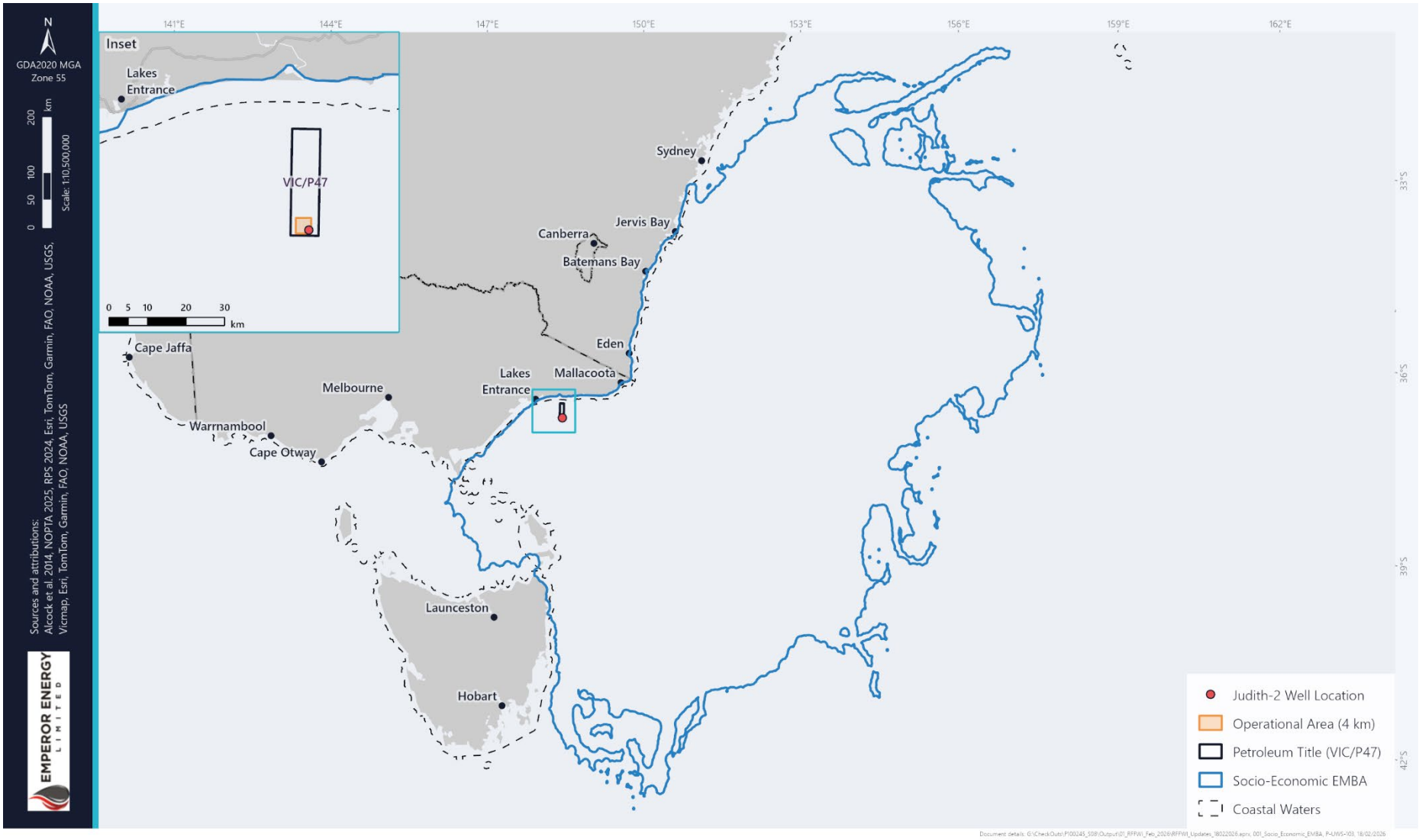


Figure 7-1: Judith-2 Well Socio-Economic EMBA

Table 7-1: Hydrocarbon exposure thresholds for Socio-economic EMBA

THRESHOLD EXPOSURE VALUE	DESCRIPTION	LOCATION OF HYDROCARBON
1 g/m^2	Low	Floating (Surface)
10 g/m^2	Low	Shoreline
10 ppb	Low	Dissolved
100 ppb	Moderate	Entrained

7.3.1. Regulatory Framework

Emperor Energy has followed the requirements of Regulation 25 of the OPGGS(E) Regulations to identify relevant persons, these being:

- Each Commonwealth or State agency or authority to which the activities to be carried out under the environment plan may be relevant
- The Department of the responsible State Minister
- A person or organisation whose functions, interests or activities may be affected by the activities to be carried out under the EP
- Any other person or organisation that the Emperor Energy considers relevant

Commonwealth and State Government agencies relevant to this EP have been identified based on their responsibility for managing or protecting the marine environment, including those with responsibilities for environmental and fisheries management, oil pollution preparedness and response, defence and communications, biosecurity, maritime/navigational safety, marine parks and Native Title.

Commonwealth and State managed fisheries relevant to this EP have been identified based on fishery zone overlap with titles, the Judith-2 well location and consideration of Commonwealth and State fishing effort data. Relevant persons for this EP are outlined in APPENDIX D .

The effort in broadening the consultation beyond that historically required is a result of the "instructive reasons given by the Full Federal Court of Australia, in its appeal decision *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (appeal decision) on 2 December 2022, which from this date, represents the law regarding requirements for consultation in accordance with the OPGGS(E) Regulations "(GN2086 – Consultation in the course of preparing an environment plan".

Emperor Energy's approach to consultation was to not look to unnecessarily restrict any person claiming to be a relevant person from being treated as such.

7.3.2. Search Criteria

To support the geospatial and database searches, structured online searches to identify relevant persons that can have the potential to be impacted within the Socio-economic EMBA by activity were conducted to support the identification of relevant persons. Searches included, but were not limited to:

- Broad keyword and filter search parameters such as geographic (e.g. Victoria, Gippsland, Bass Strait), sector-specific (e.g. fisheries, tourism, heritage), organisational type (e.g. NGO, tourism or research institute)
- Databases sources such as government portals, industry association websites, and cultural heritage registers

7.3.3. Relevant Person Identification Process

After identifying categories of groups that may be affected by the proposed activities that may be relevant to the Socio-economic EMBA, individual relevant persons from each group were identified by reviewing:

- Review of identified relevant persons in publicly available Environmental Plans in the Gippsland Basin area that may be relevant to this activity
- Commonwealth and State fisheries jurisdictions and fishing effort in the Socio-economic EMBA
- NOPSEMA Guideline (N-04750-GL1887 A705589): Consultation with Australian Government agencies with responsibilities in the Commonwealth Marine Area
- Review of information previously provided during engagement and consultation activities
- Desktop research of publicly available information, studies, and key word searches
- Review of Socio-economic EMBA overlap and adjacent overlap with Native Title, registered or determined claims, ILUAs, sacred sites, IPAs, and RAPs to identify First Nations groups
- Review of the National Native Title Tribunal website
- Review of cultural heritage databases and Country plans
- Review of marine park management plans
- Review of local government areas
- Review of petroleum, greenhouse gas and any other NOPTA issued titles
- Review of recreational fishing and areas of interest to charter and tourism operators
- Review of research institutes, infrastructure operators, historical heritage groups or organisations, and environment or conservation groups with potential for activity within the Socio-economic EMBA
- Media advertising.

The searches purposes of these searches are listed in Table 7-2.

Table 7-2: Identification sources and search criteria

SOURCE	PURPOSE
Socio-economic EMBA	Identify geographic and cultural sensitivities
Public EP Benchmarking	Validate categories and ensure regional consistency
Fisheries Data	Determine Socio-economic EMBA overlap and fishing effort
Native Title Registers	Identify First Nations groups and cultural heritage interests
Government Registers	Confirm agency responsibilities
Industry Associations	Capture sector-specific stakeholders
Media Advertising	Enable self-identification and extended reach in local areas
Online database searches	Capture additional stakeholders through keyword-based searches

7.3.4. Verification of relevant person identification

The relevant person identification process was implemented in accordance with the methodology described in Section 7.3. This includes requests to relevant persons to advise of any additional persons or organisations who may also be relevant.

Where recommendations were received to contact additional organisations or individuals, these were assessed to determine whether the suggested party met the definition of a relevant person under Regulation 25 of the OPGGS(E) Regulations. In some instances, recommendations related to advisory or coordination roles rather than parties whose functions, interests, or activities may be affected by the proposed activities. In such cases, Emperor Energy determined that consultation with the primary responsible authority or recognised representative body was sufficient to address the matter raised.

This approach ensured that consultation remained focused on relevant persons as defined under the Regulations, while still considering information provided during consultation.

7.3.5. Extended Enquiry- Media Advertising

Efforts to identify relevant persons were not restricted to the Socio-economic EMBA, as interests within the Socio-economic EMBA may be held by persons or organisations residing outside the Socio-economic EMBA. Extended enquiry was made to search within and beyond the Socio-economic EMBA through media advertising extending from Sydney to Melbourne and northern Tasmania. Advertising comprised regional media across the south coast of NSW, Gippsland and northern Tasmania, further broadened through metro-based state-wide press in Melbourne and Sydney. In addition, the Koori Mail (indigenous press) was used to provide nation-wide coverage.

To further support broad capture, identified relevant persons were asked to share knowledge of any other persons whose interests, functions or activities might be impacted by the planned activities under this EP. In addition, advertisements were run twice with the latest campaign in December 2024 using the following

papers, providing coverage from south Gippsland to south of Sydney, and across NSW, Victoria and norther Tasmania via major metropolitan press, and Australian wide in the Koori Mail.

Regional press

- Bairnsdale Advertiser
- The Bridge – Yarram District
- Foster Mirror
- Lakes Post
- Orbost Snowy River Mail
- Sale Gippsland Times
- Eden Magnet
- Bega District News
- Eurobodalla Independent
- Illawarra Mercury
- Moruya Examiner
- Narooma News
- Nowra News
- South Coast Register

Metro-based

- Herald Sun (state-wide)
- Daily Telegraph (state-wide)
- The Examiner – Launceston (northern Tasmania region)

National

- Koori Mail

Overall interest and response levels were relatively low, most likely due to familiarity with oil and gas operations over the last 50 years in the offshore Gippsland region. Only two persons self-identified as a result of advertising, and a number were recommended via other relevant persons.

7.3.6. Self-Identification

In addition to relevant persons identified by Emperor Energy, Emperor Energy adopted an inclusive approach to stakeholder identification, ensuring that no unnecessary barriers were placed on parties seeking to self-identify as a relevant person to the activity. Individuals or organisations wishing to be considered were required to demonstrate a clear connection to the proposed activities by outlining how their functions, interests, or activities could be affected. Full contact details were also requested to enable ongoing engagement should they elect to participate.

Once confirmed as relevant persons, these stakeholders were consulted in accordance with the process described in Section 7. Two stakeholders self-identified as relevant persons following media advertising.

7.3.7. First Nations Groups and Individuals Engagement Approach

Emperor Energy acknowledges that Sea Country is culturally significant to First Nations people who hold a cultural responsibility to manage and care for Sea Country. Given the values and sensitivities outlined in Section 4.9, there is potential for some First Nations groups and peoples to be considered 'Relevant Persons' in relation to the proposed activities set out in this EP. Emperor Energy acknowledges the interconnectedness of Sea Country, along with the importance of respectful engagement with Registered Aboriginal Parties and Registered Native Title Body Corporates. Emperor Energy's method to identifying potential First Nations peoples that may be relevant persons to the activity included:

- Assessed the values and sensitivities of the physical and cultural environment that may be affected by planned and unplanned activities in the EP, including the spatial extent of activities
- Conducted desktop research to identify published Sea Country plans, Healthy Country plans, research or management plans that might identify culturally significant landscapes, species, cultural values and sensitivities relevant to activities
- Searched the National Native Title database to identify any Native Title claims or determinations within or adjacent to the Socio-economic EMBA
- Searched the Victorian Aboriginal Heritage Council online map to identify Recognised Aboriginal Parties in Victoria
- Searched for Prescribed Bodies Corporate, Registered Aboriginal Parties, Native Title holders and claimants in Victoria, northern Tasmania and NSW
- Visited local government authority websites (shire or municipal council) who often include acknowledgment of local Traditional Owners
- Consulted Aboriginal Corporations and Land Councils within or adjacent to the Socio-economic EMBA to determine preferred engagement process and discuss whether there might be any additional First Nations people or groups relevant to the Socio-economic EMBA, including
    - Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC)
    - Bunurong Land Council Aboriginal Corporation
    - New South Wales Aboriginal Land Council
    - Tasmania Aboriginal Centre
    - Victorian Aboriginal Council

As determined by the Victorian Aboriginal Heritage Council in 2007, GLaWAC is the Registered Aboriginal Party that represents the Gunaikurnai people, who are the Traditional Custodians of the Land and Sea Country of the Operational Area. As determined by the *Victorian Aboriginal Heritage Act* (2006), GLaWAC are recognised as the primary custodians, keepers and knowledge holders or Aboriginal cultural heritage and are the primary source of advice and knowledge on matters relating to First Nations cultural values and sensitivities within the Operational Area. During consultation, GLaWAC provided the GLaWAC Pathways to Partnership which provided further guidance on developing a positive working relationship with GLaWAC. Emperor Energy is continuing to undertake engagement with GLaWAC support this EP.

Emperor Energy has also identified other First Nations groups who may have an interest in the activity. The details of consultation with First Nations groups is summarised within APPENDIX D

Emperor Energy is committed to the protection of First Nations cultural values and sensitivities, which is demonstrated through control measures and performance standards as listed within Section 5. Emperor Energy acknowledges that there is potential for new information on cultural values and sensitivities that may arise after submission of this EP and during the activity. Additional cultural values or sensitivities identified will be managed as part of Emperor Energy's commitment to ongoing consultation as described in Section 7.9.

7.3.8. Commercial Fisheries Engagement Approach

A methodology to identify commercial fisheries was used which aligns with the methodology approach provided by AFMA (2026) for consulting with the fishing industry, contacting Commonwealth fishery associations, and providing resources to define the boundaries of commonwealth fisheries to support assessment of potentially impacted fisheries.

Emperor Energy sourced publicly available information from State fishery management authorities, Australian Fisheries Management Authority (AFMA), Commonwealth Fisheries Association (AFA), and Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) fishery reports to identify State and Commonwealth commercial fisheries that have the right to operate in the Socio-economic EMBA. This data was used to prepare comprehensive assessments of fisheries that overlap the Operational Area and EMBA, and prepare maps showing fishing intensity for commercial fisheries (Section 4.8.1 and Section 4.8.2). Emperor Energy also encouraged the self-determination of commercial fishers through the extended enquiry through media advertising outlined in Section 7.3.5, and self-identification in Section 7.3.6.

Recently representative bodies of commercial fisheries, or peak bodies have begun to provide consultation services to consult with commercial fisheries on behalf of the offshore industry. Emperor Energy engaged directly with recognised commercial fisheries peak bodies on the basis that these organisations are formally established to represent the interests, rights, and operational concerns of commercial licence holders, records of this consultation process and outcomes are recorded in Appendix D. This approach aligns with recognised best-practice engagement methods outlined in the Offshore Energy Industry Consultation with the Commercial Fishing Industry (AFMA, 2026) and is widely adopted across accepted NOPSEMA environment plans.

Some peak bodies who were engaged advised that, due to confidentiality obligations and commercial sensitivities, they were unable to provide Emperor Energy with a comprehensive list of individual licence holders or confirm which specific operators received consultation materials. As a result, Emperor Energy was not able to independently verify the full membership coverage of each peak body. However, based on publicly available information and their recognised role within the fisheries sector, these peak bodies are understood to broadly represent the commercial fisheries with potential to operate within the socio-economic EMBA. Consultation information was provided to peak bodies with the request that it be distributed through their established communication channels, consistent with industry practice outlined in fisheries consultation frameworks.

Emperor Energy engaged with fisheries stakeholders primarily through peak bodies recognised by government and industry as the representative voice for commercial licence holders. This approach was adopted for the following reasons:

- Representation through Peak Bodies such as: (AFMA), Australian Southern Bluefin Tuna Industry Association (ASBTIA), Abalone Council Australia, Seafood Industry Victoria (SIV), South East Trawl Fishing Industry Association (SETFIA), Tuna Australia (TA), and Victorian Fisheries Authority (VFA) recognised bodies represent the collective interests of licence holders and maintain established communication channels with their members.

- Fee-for-Service Agreements: Formal agreements ensured timely and accurate dissemination of consultation materials, with peak bodies distributing notices and information sheets directly to members.
- Regulatory Alignment: Regulation 25 requires consultation with persons whose functions, interests, or activities may be affected. Peak bodies satisfy this requirement as they advocate for and protect the interests and confidentiality of their members.
- Efficiency and Practicality: Peak bodies provide a centralised, transparent mechanism for consultation.
- Confidentiality and Stakeholder Preference: Many fisheries licence holders prefer to communicate through their representative organisations to maintain confidentiality regarding commercial operations.

As the peak bodies do not represent all fisheries, there were also additional fishery operators or associations identified using geospatial boundaries found using AFMA, published Environment Plans, and fishery search tools who were identified and contacted.

Consultation materials were distributed via peak bodies on multiple occasions, and members were invited to provide feedback through established channels. No objections or claims were raised during this process.

Emperor Energy entered into the following agreements with peak fishing bodies to disseminate information to licence holders:

- SETFIA: Consultation notices distributed to members via email and newsletters to consult with members of the following fisheries:
  - South East Trawl Fishery (Cth).
  - Gillnet Hook and Trap Fishery (Cth).
  - Eastern Zone Rock Lobster Fishery (Vic).
  - Central Zone Scallop Fishery (Cth).
  - Small Pelagic Fishery (Cth).
- Seafood Industry Victoria: Fee-for-service arrangement for member notifications through newsletter sent to members.
- Tuna Australia: Fee-for-service arrangement for member notifications and report stating high level on confidence consultation was reached by members
- Victorian Fisheries Authority: Coordination for broader fisheries engagement and regulatory alignment.

Emperor Energy acknowledges that there is potential for new information or additional commercial fisheries that may arise after submission of this EP or during the activity. New information that may be relevant to the activity will be managed as part of Emperor Energy's commitment to ongoing stakeholder consultation commitments as described in Section 7.9.

Table 7-3 lists the categories of relevant persons against the environmental aspects that are known to be or likely to be of most interest to them.

7.4. Provision of Sufficient Time

Emperor Energy's consultation methodology provides for a minimum consultation period of 30 days for relevant persons, where practicable, having regard to when the relevant person is identified, the stage of EP development, and whether the relevant person requests additional time or engagement.

This timeframe aligns with industry practice and exceeds the minimum requirements under Regulation 25 (2) of the OPGGS(E) Regulations. While 30 days is considered sufficient, extended periods have been offered where complexity or cultural considerations warrant additional time.

In practice, many relevant persons have been provided with consultation periods ranging from 30 days to 3 years. No relevant person has requested additional time, demonstrating adequacy of the consultation period.

During the EP development phase some newly identified relevant persons were contacted later in the consultation process but did not request further information or additional time prior to EP submission. Emperor Energy is committed to maintaining on-going consultation throughout the lifecycle of the EP submission process and throughout the activity. Follow-up attempts were undertaken for many non-responsive stakeholders, reflecting a proportionate and practical approach to engagement. Therefore, Emperor Energy considers that a reasonable opportunity is provided for all stakeholders to participate in consultation has been provided.

This approach reflects best practice principles of meaningful engagement and ensures compliance with Regulations 25(3) of the OPGGS(E) Regulations, supporting genuine two-way dialogue throughout the EP development process.

Table 7-3: Aspects and groups of relevant persons under Reg 25(1)(d)

RELEVANT PERSON GROUP	PLANNED						UNPLANNED				
	Seabed disturbance	Interaction with other users	Planned discharges – subsea	Planned discharges – surface	Emissions - light	Emissions - atmospheric	Emissions - sound	Physical presence - Interaction with marine fauna	Introduction of IMS	Accidental release – hazardous materials	Accidental release – vessel collision	Accidental release – low of well control
Conservation Groups / Environmental NGOs								✓			✓	✓
Energy and Port Operators		✓									✓	✓
First Nations					✓		✓	✓	✓		✓	✓
Local Government											✓	✓
Commercial Fisheries		✓					✓		✓		✓	✓
Tourism and Recreations		✓									✓	✓
Other marine based businesses		✓									✓	✓

7.5.Sufficient Information

The OPGGS(E) Regulations require titleholders to give each relevant person sufficient information to allow the relevant person to make an informed assessment of the possible consequences of the activities on the functions, interests or activities of the relevant person.

Two versions of a standard information sheet were provided to relevant persons in addition to tailored information within correspondence emails (including tailored responses to feedback) where appropriate and as described in APPENDIX D . The information sheets were also posted on the corporate website and contained the following information:

Information sheet Version 0 and Version 1 (March 2023)

- Overview of Emperor Energy
- Purpose of the project
- Location and water depths of the project
- Proposed timing of project
- Email address for consultation
- Overview of proposed activities
- EP assessment steps including public comment
- Location map
- Description of high level impacts, risks and controls
- Description of a seabed survey
- Purpose of seabed shallow seismic survey
- High level overview of drilling activities
- VSP overview
- Process of "plug and abandonment"

(No material difference between Version 0 and Version 1)

Information sheet Version 2 November 2024, and October 2025 Newsletter

- Updated information sheet noting changed timing.
- Noted purpose of the project
- Consultation under Section 25 of the Environment
- Advised that the relevant person could request that any sensitive information provided not be published
- Requested advise of other relevant persons that might be known the relevant person
- Described the nature and location activities and proposed timing
- Provided information about the consultation process
- Noted potential high-level impacts and risks

- Provided link to NOPSEMA's brochure "Consultation on offshore petroleum environment plans – Information for the community"
- A clear avenue to additional information was provided through a contact email address

As described above the information sheets provided details on when and where the activities were proposed and were in simple English. They contained descriptions of high order impacts and risks, such as seismic noise, vessel interactions, interactions with marine fauna, and unplanned hydrocarbon releases, in sufficient detail whereby relevant persons could focus on areas of interest and seek further information on matters important to them. Simple imagery was provided to support complex concepts, such as geophysical and geotechnical surveys. The information provided allowed for an assessment of the possible consequences of the proposed activities on a relevant person's functions, interests or activities with clear pathways for further information or clarifications.

Simple English overviews were also provided in lay terms of how some key activities are carried out. Information was also provided to each relevant person regarding the consultation process itself, and each relevant person was provided a link to NOPSEMA's brochure "Consultation on offshore petroleum environment plans- information for the community" that provides further comprehensive information on the consultation process and Emperor Energy's obligations.

Clear contacts were provided that served as an avenue for further tailored information as required. There are no outstanding requests for further information.

Emperor Energy was flexible in how it carried out consultation so as to accommodate requirements of relevant persons. Consultation was generally via email and phone calls, with email and phone correspondence tailored to each relevant person. Online meetings were also held with a number of relevant persons. Importantly, Emperor Energy always provided an opportunity to meet with one of its senior corporate representatives at locations that were convenient for relevant persons.

In the case of First Nations Peoples, the opportunity was always available to meet on-country, with an organisation's members or management, and enquiries were made to endeavour to confirm the type of participatory model each organisation applied. Advice was always provided that information could be kept sensitive and not published if requested. This general approach provided a reasonable opportunity to highlight key cultural places, values and sensitives in a culturally safe manner if cultural knowledge holders wished to do so.

Details of calls, meetings and correspondence are captured in summary report (APPENDIX D) and the sensitive information file.

7.6.Relevant Person Consultation Outcomes

APPENDIX D provides a summary of the stakeholder consultation undertaken as part of the development of the EP. The summary provides details of the information sent to stakeholders and any response received. It also details the assessment undertaken of any objection or claims.

7.7.Management of Objections and Claims

Where an objection or claim was raised by relevant persons, they were provided feedback as to how they were assessed and any measures adopted resulting from the consultation.

Where the objection or claim had merit, it was assessed as per the risk assessment process detail in Section 2 and controls applied where appropriate to manage impacts and risks to ALARP and an acceptable level.

Relevant persons were provided with feedback as to the merit of objections or claims had merit and if not why, and details of any measures adopted because of the consultation.

7.7.1. Assessment of feedback

Emperor Energy applies a structured and consistent process to assess feedback, objections, and suggestions received during consultation to determine whether the matters raised have merit in relation to the proposed activities.

Feedback received from relevant persons is assessed having regard to the following considerations:

1. Relevance to the proposed activities:

Whether the feedback relates to activities described in the EP and whether the stakeholder's functions, interests, or activities may be affected by those activities in accordance with Regulation 25 of the OPGGS(E) Regulations.

2. Credible impact or risk pathway:

Whether the feedback identifies a plausible pathway by which the proposed activities could result in an environmental impact or risk, including consideration of activity location, duration, and nature.

3. Applicability to the activity context:

Whether the feedback or recommendation is applicable to the specific operational context, including water depth, seabed interaction, likelihood of interaction with sensitive receptors, and existing regulatory controls.

4. Consistency with existing controls and regulatory requirements:

Whether the matter raised is already addressed by controls described in the EP or by existing regulatory requirements, standards, or approvals, and whether additional measures would materially reduce risk.

5. Proportionality and ALARP considerations:

Whether adoption of additional measures would be proportionate to the level of risk identified and consistent with the requirement to manage impacts and risks to as low as reasonably practicable and acceptable levels.

6. Evidence and information provided:

The extent to which the feedback is supported by site-specific information, regulatory guidance, or relevant technical or scientific evidence.

Based on this assessment, feedback may result in;

- Confirmation that existing controls are sufficient,
- Adoption or refinement of measures within the EP; or,
- No change to the EP where feedback is not considered applicable, proportionate, or relevant to the proposed activities.

Where feedback does not result in the direct adoption of specific measures, Emperor Energy documents the rationale for this outcome and provides a statement of response to the relevant person, explaining how the feedback was considered and why the adopted approach is appropriate as demonstrated in APPENDIX D . This assessment process ensures that stakeholder feedback is considered in a transparent, reasonable, and proportionate manner.

7.8. Public Comment

A version of this EP ahead of the first assessment by NOPSEMA was published for Public Comment on the NOPSEMA website between the 5th of May to the 4th of June, 2025 as per Regulation 30 of the OPGGS(E) Regulations. No public comments were received during the open Public Comment period.

7.9. Stakeholder Engagement

Regulation 25 of the OPGGS(E) Regulations mandates that appropriate consultation with relevant Commonwealth and state authorities and other relevant interested persons or organisations will be carried out as part of the implementation strategy. This consultation takes place after the final submission of the environment plan (EP) to NOPSEMA, prior to its acceptance, and continues throughout the implementation phase.

Consultation is undertaken with relevant persons who have requested to be kept informed about the proposed activities, as well as with regulatory agencies and other stakeholders whose functions, interests, or activities may continue to be affected during the lifecycle of the EP, including post EP award.

Relevant persons who request ongoing updates are identified through consultation records and correspondence and are maintained on a stakeholder database. These stakeholders are provided with information relevant to the stage of the activity, including updates on timing, regulatory status, and material changes to impacts or risks, where applicable. Records of any post acceptance consultation will be maintained in the Emperor Energy stakeholder database.

Ongoing stakeholder engagement will be proportionate to the stakeholder's interests and the nature of potential impacts and is undertaken through established communication channels including email correspondence, newsletters, direct engagement, and updates via the project website. Received feedback from stakeholders shall be treated as per the same arrangements during the initial consultation process (in development of this EP), with correspondence logged, assessed and feedback provide if/ as required.

Engagement with relevant stakeholders includes:

- Implement commitments made during earlier consultation, including agreed milestone notifications, follow ups such as data sharing commitments, and discussions to ensure emergency preparedness is maintained.
- Engage newly identified relevant persons to capture additional comments or concerns, assess whether any significant new impacts or risks have arisen, identify opportunities for continuous improvement, and provide feedback on how issues or concerns have been addressed, including improvements made to the EP.
- Engage existing relevant persons to consider changes to impacts or risks that may affect their functions, interests, or activities; evaluate the merits of any objections or claims; respond to these objections or claims; and incorporate any new measures through the consultation records.

Any objections or claims arising from consultation will be assessed for merit, and new measures will be implemented through the stakeholder database. This process will also determine if any issues identified during consultation necessitate a revision of the EP.

To facilitate ongoing consultation, Emperor Energy will monitor for newly identified relevant persons and maintain a commitment and notification management register for agreed notifications or follow ups. Records of all consultation activities will be maintained in the stakeholder database, alongside a

commitment and notification management register documenting any notifications required under this EP, whether arising from consultation or regulatory obligations.

This consultation process has been developed in line with the OPGGS(E) Regulations, relevant guidance, case law, and Emperor Energy's corporate values. Consultation is inherently dynamic, and grey areas may arise; such cases will be managed through the ongoing stakeholder consultation process, with the objects of the OPGGS(E) Regulations guiding decisions where issues remain unresolved.

7.10. Commitment and Notification Management

Emperor Energy maintains a consultation commitment register (Table 7-4). This register is based on legislative requirements and agreements with relevant persons who have requested for notifications of the project made during consultation, or as otherwise deemed appropriate by Emperor Energy. The register includes:

- The relevant person or organisation
- The nature of the agreed commitment or notification
- The trigger or timing for delivery
- Confirmation when the commitment has been completed

The commitment register supports consistent delivery of agreed actions and ensures that ongoing consultation arrangements are implemented in a structured and auditable manner. The register is maintained alongside consultation records and correspondence logs and is subject to internal governance and review.

Engagement with stakeholders shall continue post-EP approval, through the operational phase of the project and into closure of this phase of the project. Emperor Energy's ongoing stakeholder information release plan (Table 7-5) outlines how project information will be released to enable continued engagement with stakeholders.

Table 7-4: Ongoing consultation requirements (consultation notifications and commitments register)

PERSON OR ORGANISATION	ONGOING REQUIREMENT	TIMING
Relevant interested persons or organisations (including First Nations peoples and groups, Commercial Fisheries, Local governments, communities and industry)	Ongoing engagement will include responding to reasonable requests from existing relevant persons or other interested persons and organisation as detailed in APPENDIX D. As outlined in Appendix D, the following stakeholders have requested to receive continuing regular project updates ; AHO, AMFA, Amplitude Energy, ASBTIA, BIAV, Destination Gippsland, DoD, GLaWAC, Heritage Victoria, Min. D'Ambrosio and Min. Bull, ORCV, Parks Victoria, Surfing Victoria, Tuna Australia, Victorian Aboriginal Heritage Council, and Visit Northern Tasmania. Table 7-5 details Emperor Energy's ongoing regular project update plans, continuing through to the planned offshore activities completion. Requirements of new requests will be assessed and implemented under the management of change process (Section 8.10).	Refer Table 7-5 New requests agreed under the management of change process (Section 8.10).
AHO	Drilling or vessel contractor to issue notification of activity for publication of notice to mariners. Information provided should detail: • Type of activity. • Geographical coordinates of the activity. • 500 m MODU safety exclusion zone and 2 km cautionary zone and requested clearance from other vessels. • Period that Notice to Mariner (NTM) will cover (start and finish date). • MODU and/or vessel details including MODU and vessel names, and communications details • Emperor Energy, MODU and vessel contractor contact details. Only need to update AHO of changes including if activity start or finish date changes. Do not need to provide cessation notification as long as NTM covers period of activity.	21 days prior to activity commencing

PERSON OR ORGANISATION	ONGOING REQUIREMENT	TIMING
AMSA - JRRC	Drilling or vessel contractor to issue notification of activity for publication of Auscoast warning. Information provided should detail: • Type of activity. • Geographical coordinates of the activity. • 500 m MODU safety exclusion zone and 2 km cautionary zone and requested clearance from other vessels. • Period that warning will cover (start and finish date). • MODU and/or vessel details including MODU and vessel names, and communications details. • Emperor Energy, MODU and vessel contractor contact details. Only need to update JRCC of changes including if activity start of finish date changes. Do not need to provide cessation notification as long as Auscoast warning covers period of activity.	48 – 24 hrs prior to activity commencing
NOPSEMA	Regulatory notification of start of activity.	10 days prior to activity commencing
NOPSEMA	Regulatory notification of cessation of activity.	Within 10 days of activity completion

Table 7-5: General ongoing stakeholder information release plan

INFORMATION RELEASE FORMAT	DETAILS	TIMING
Website (emperorenergy.com.au)	The Emperor Energy website contains details of the company and these planned operations. The website shall be frequently updated with new information, including but not limited to: • Technical details of the planned (or completed) operations • Scheduled events and planned operational windows • Frequently asked questions • Progress updates • Historical newsletters, information flyers also available • Link to the Environment Plan on NOPSEMA website • Details on how to contact Emperor Energy	As required, review monthly
Project Newsletter	Distributed digitally via email, the Project Newsletter will be released to all stakeholders on record. Stakeholders will be able to opt-out of this subscription. The Project Newsletter will include present status of the project including key upcoming events/ operational dates and information on the planned offshore activities.	By the 15th day of each quarter: July 2026, October 2026, January 2027, April 2027, July 2027
Email Update	Used to communicate the commencement and completion of offshore activities or other key information that may have changed since the previous Quarterly Project Newsletter.	As required
Stakeholder Information Sessions	Stakeholder information sessions will be held to provide an opportunity for the community and stakeholders to meet the project team and ask questions or express concerns.	Quarterly One month post release of Project Newsletter. Or as additionally arranged/ requested by stakeholder.

INFORMATION RELEASE FORMAT	DETAILS	TIMING
ASX Release	As a listed Company on the Australian Securities Exchange, Emperor Energy provides regular market updates.	As required

8. IMPLEMENTATION STRATEGY

As required by Regulations 22 of the OPGGS(E) Regulations, Emperor Energy has prepared this implementation strategy for the design and execution of the activity under the framework of the Emperor Energy HSE Policy (APPENDIX A . Contractors will be required to comply with all relevant requirements of the Emperor Energy's HSE Policy and commitments made within this EP and OPEP, to ensure Emperor Energy's environmental performance outcomes are achieved.

Emperor Energy, as the petroleum titleholder, retains full, ultimate responsibility for the activity and for ensuring that all environmental performance outcomes and environmental performance standards specified in this Environment Plan (EP) are achieved. This includes maintaining oversight, control and assurance of all operational, environmental and emergency response arrangements implemented by Emperor Energy personnel, contractors and third-party service providers. Emperor Energy organisational structure is detailed in Figure 8-1.

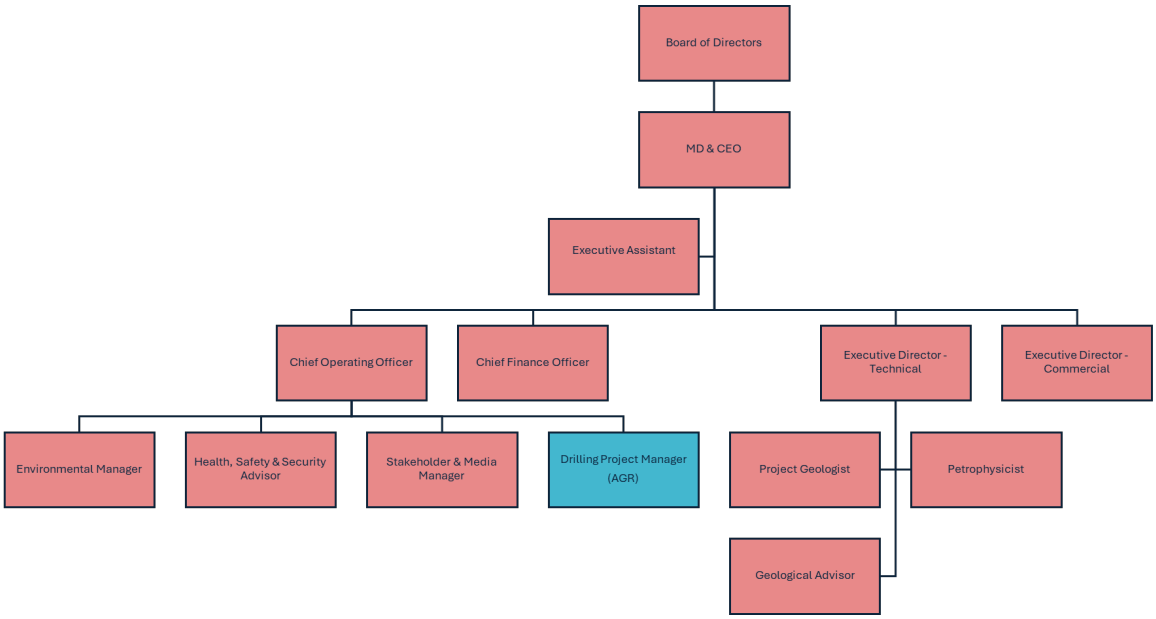


Figure 8-1: Emperor Energy Limited - Organisational Chart

To support consistent and effective implementation of the EP, the activity will be undertaken in accordance with a defined suite of work instructions, procedures and operational plans. These documents will be maintained within Emperor Energy's management system and the management systems of contracted organisations. Activity-specific procedures, interface protocols and bridging documents will also be developed to clearly align Emperor Energy requirements with contractor systems, ensuring that:

- roles and responsibilities are unambiguous
- control measures and environmental performance standards are accurately translated into contractor work instructions
- operational practices fully reflect the commitments made in this EP
- assurance, monitoring and verification processes remain under Emperor Energy's oversight

These documented arrangements collectively ensure that all parties involved in the activity operate under a coherent and integrated framework, enabling Emperor Energy to maintain effective operational control, regulatory compliance and environmental performance consistent with its obligations as titleholder.

8.1.Activity Management Arrangements

AGR Australia Pty Ltd (AGR) is the Drilling Management Contractor appointed to this project by Emperor Energy. AGR is responsible for providing project management and well delivery services for the seabed surveys and drilling of the Judith-2 well, including the preparation of all documents required for regulatory approvals and procurement of the MODU, vessel hire and associated service partners required to complete the Judith-2 work program.

AGR is the world's largest independent well management consulting group and since 2000 has drilled over 500 wells in 26 countries for over 100 operators without any major HSE incidents. In Australia, AGR has drilled over 40 offshore wells in all the major basins.

AGR will utilise is propriety Well Delivery Process (WDP) for the engineering design and operational delivery of the Judith-2 program.

8.1.1. AGR Delivery Assurance

The Emperor Energy COO is accountable to ensure AGR compliance with their Well Delivery Process, contractual and regulatory commitments. The Emperor Energy COO is the final signatory on AGR generated documentation, accepting the suitability on behalf of Emperor Energy. Progress against the project delivery plan and compliance with the WDP will be monitored by the Emperor Energy COO.

8.2.Activity Organisational Structure

Figure 8-2 provides an overview of the relationship between Emperor Energy, AGR, MODU contractor and vessel contractors for the activity.

AGR is responsible to Emperor Energy who has overall responsibility for the management of the activity to ensure that:

- Design and execution of the activity is in accordance with industry best practice and legislated standards.
- All regulatory approvals are obtained prior to activity commencement.
- Contractors have the appropriate resources and equipment to undertake the activity and have appropriate systems in place to ensure that these activities are undertaken in accordance with all legislative requirements and this EP.
- The environmental impacts and risks of the activity are of an acceptable level and are reduced to ALARP, and environmental performance is monitored.
- The day-to-day direction of work and the monitoring and auditing of work by contractors is undertaken in accordance with this EP.

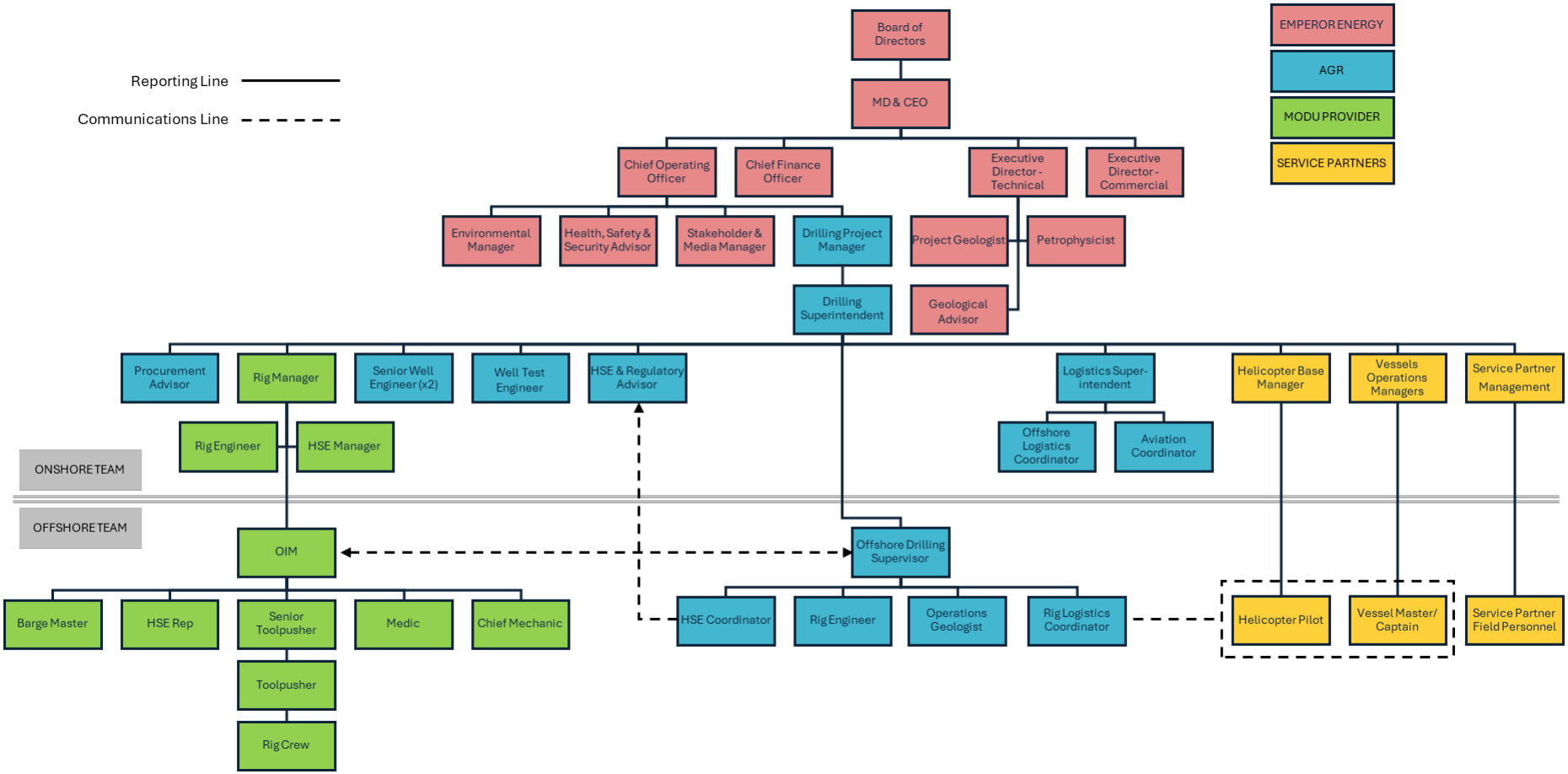


Figure 8-2: Key Emperor Energy and Contractor Personnel

The MODU contractor will have the day-to-day control and management of the MODU through the Offshore Installation Manager (OIM) and vessels through the respective Vessel Masters. The OIM and Vessel Masters have authority and responsibility to make decisions with respect to environment protection and pollution prevention and to request assistance as may be necessary.

Roles and responsibilities specific to the EP are outlined in Table 8-1. These will be communicated to all personnel involved in the activity. Emperor Energy retains full and ultimate responsibility as the Titleholder. As the Titleholder, Emperor Energy has entered into an agreement with AGR to provide the following ongoing services through this phase:

- Integrated Management System (i.e., health, safety and environment) and support (resource) services.
- Incident management capabilities associated with this activity.

Emperor Energy, AGR, the MODU and vessel contractors will undertake the activity as follows:

- Emperor Energy is the Titleholder for the permit and is the Permit Operator.
- AGR provides the necessary services and resources in order to act as the Project Manager for Emperor Energy.
- The relationship between the parties is governed by a Project Execution Plan (PEP), however the working relationship between the parties, both internal to them and externally, is seamless except where legislation requires otherwise.
- AGR has principal responsibility for the design of the Judith-2 well and the design and / or management of the contracting services.
- AGR will provide Emperor Energy with full technical, engineering and project management services.
- The MODU and vessel contractors are responsible for operating the MODU and vessels while conducting the activity and interfacing with service contractors at the operations level on the vessels.
- The MODU and vessel contractors are responsible for ensuring the safety of all personnel on board their respective facility and vessels.
- The MODU and vessel contractors are responsible for day-to-day implementation of this EP with AGR supervision.
- The MODU and vessel contractors are responsible for the offshore management of emergency incidents including oil spills from the MODU or vessels.
- AGR is responsible for the onshore management of emergency incidents.
- The AGR Drilling Supervisor will be the designated Emperor Energy representative on the MODU and will have a direct interface with the MODU Contractor OIM.

8.2.1. Contractor Management Systems

The MODU OIM and Vessel Masters have ultimate responsibility for their MODU or vessel and persons on board, including compliance with legal requirements and on-site control of emergency situations or incidents. Roles and responsibilities relating to emergency situations are documented in various locations such as station bills, the project-specific Incident Response Plan, OPEP and the vessel SOPEPs.

8.3.Roles and Responsibilities

The organisational structure for the activity consists of onshore and offshore AGR, MODU, vessel and other contractor personnel. The organisational structure for the activity is illustrated in Figure 8-2 , while the roles and responsibilities of key project team members are summarised in Table 8-1.

Day-to-day implementation of the EP will occur on the MODU under the leadership of the OIM, and for the vessels under the leadership of the Vessel Masters. The AGR Project Manager will have oversight of the performance of the Project against the EP and other project plans and will initiate reviews and audits as required.

Table 8-1: Key Roles and Responsibilities

ROLE	RESPONSIBILITY
Emperor Energy	
Emperor Energy Managing Director	• Ensure resourcing and capability for all parties: Emperor Energy, AGR, and contractors (personnel, offices, equipment and systems). • Lead communications with Emperor Energy Board of Directors as required. • The Managing Director will act as the Crisis Management Team (CMT) Lead directing the company's response to a crisis as outlined in the Emperor Energy Crisis Management Plan (CMP) • The CMT Leader is responsible for: – Establishing and communicating strategic goals with other members of the CMT; – Ensuring response actions are aligned to statutory, regulatory and legal requirements. – Ensuring Company Executive and Board are briefed on the crisis response and related issues. – Ensuring the company maintains sufficient resources to manage incident response over extended periods; and – Provides supports to the IMT IC to provide safe and efficient response structure and organisation. – Ensure training of Emperor Energy staff as required under the Crisis Management Plan.
Emperor Energy COO	• Maintain operational oversight and accountability for the planning and execution of the planned operations. • Accountable for compliance with regulatory commitments. • Primary technical interface between Emperor Energy and AGR, review/ approval of AGR technical and commercial decisions. • Provide technical and operational expertise into Emperor Energy Management and Board.

ROLE	RESPONSIBILITY
	• Maintain regulatory approvals and submission accountability (review/approve EP, EPR, commencement and end notifications; ensure pre-commencement approvals). • Ensures AGR is adequately resourced to implement the performance standards in this EP. • Provide direction on stakeholder consultation and engagement. • Review and approve incident reports for regulator submission and maintain incident reporting records. • Serve as the IMT Liaison Officer for the Crisis Management Team. The IMT Liaison Officer will be the primary interface between the Emperor Energy CMT and the AGR IMT. The responsibility of the IMT Liaison is: – Ensuring the timely availability of technical and operational information and documentation pertaining to the asset and the equipment involved in the incident; – Maintaining communications and situation awareness; – Assisting the CMT to generate and review response plans prepared by the IMT or CMT and considering options, costs and risks; – Engage technical support as required to assist with these responsibilities; and – Work with CMT to generate and review response plans considering options, costs and risks. – Provide liaison personnel in the event that a State Control Agency IMT is required throughout the response. – Maintain and manage revisions of EP and OPEP. – Perform stakeholder and technical liaison: routine contact with NOPSEMA; primary technical interface between Emperor Energy and AGR; relay IMT information to Emperor Energy. • Attends weekly contactor meetings and daily operational meetings. • Approve major changes to operations, via MoC process. • Review legislation and advise on changes and implications for the activity. • Accountable for compliance management system being maintained with appropriate levels of evidence and reporting to Emperor Energy executive management. • Ensures that contractors have appropriate equipment and systems in place to undertake activities in accordance with industry best practice and this EP.
Emperor Energy Executive Director - Commercial	• Provide commercial leadership and direction on procurement activities to support operations.

ROLE	RESPONSIBILITY
	• Attends weekly contactor meetings and daily operational meetings. • Supports the Emperor Energy CMT in the event of an incident.
Emperor Energy Chief Finance Officer	• Maintains ongoing commercial and financial tracking of contract status. • The Finance Manager will support the CMT Leader in managing the finances of the business in an emergency situation and ensure timely commitment of funds and engagement of services and support via the Financial Management System.
Emperor Energy Executive Director - Technical	• Provide leadership to the subsurface group. • Attends weekly contactor meetings and daily operational meetings. • Provide strategic advice into subsurface formation evaluation plans and continued development of the subsurface models. • Supports the Emperor Energy CMT in the event of an incident.
Emperor Energy Project Geologist	• Provide technical support for all subsurface related technical decisions. • Attends weekly contactor meetings and daily operational meetings. • Monitors subsurface dataset during operations, advise on any deviations from predicted outcomes, that may require change in drilling plans. • Support MoC process with data as required. • Supports the Emperor Energy CMT in the event of an incident.
Emperor Energy Environmental Manager	• Reviews environmental approval documentation. • Ensures this EP is prepared and revised as required. • Supports preparation of environmental induction and vessel / MODU inspection information as required. • Assists with review, investigation and reporting of environmental incidents. • Reviews and records compliance evidence into compliance management system, supporting the Emperor Energy Chief Operating Officer. • Monitors environmental performance to confirm that control measures detailed in the EP are effective in reducing the environmental risks of the activity to ALARP and acceptable levels, and the EPOs and EPSs are continually met. • Reviews any new or increased environmental impacts and risks (that are not addressed in this EP) in consultation with the Drilling Superintendent as soon as they are identified as part of the MoC process (see Section 8.10). • Supports stakeholder consultation undertaken as per the requirements of the EP.

ROLE	RESPONSIBILITY
	• Reviews operational reports and gathers evidence demonstrating that EPS have been met. • Prepares the end-of-activity notification for submission to the regulator. • Prepares and submits external regulatory reports required for the activity, in line with environmental approval requirements and EHS incident reporting procedures. • Supports the CMT and IMT in the event of an incident by: • Providing environmental risk assessments and rapid impact insights to inform decision-making. • Advising on environmental factors that may affect responder safety including exposure risks, wildlife contamination and waste hazards. • Contributing to environmental response planning and helping ensure actions align with approved EP and OPEP requirements. • Assisting with regulatory engagement, including preparing environmental notifications, reports and updates. • Coordinating environmental monitoring inputs such as modelling results, sampling data and field observations. • Guiding wildlife and waste management considerations to support safe handling, recovery and disposal. • Supplying accurate environmental information to assist internal and external communications. • Supporting post-incident environmental recovery planning, monitoring and lessons learned. • Attends daily operational meetings. • Prepares monthly and end-of-activity environmental performance reports.
Emperor Energy Stakeholder & Media Manager	• Ensures thorough and timely stakeholder consultation is undertaken prior to, during and after the activity. • Maintains a record of stakeholder communications. • Ensures ongoing stakeholder consultation undertaken as per Section 7. • Keeps relevant persons informed of emergency events that may impact their functions or interests. • Leads strategic communication with stakeholders and members of the public, media outlets with relevant and timely information as required in event of Crisis or Incident.

ROLE	RESPONSIBILITY
AGR	
Project Drilling Manager	• Ensuring AGR's drilling operations perform to the highest required standards of HSEQ as defined by the AGR organisation, government regulators and clients. • Promoting a proactive HSEQ culture within AGR operations and attendance at Project HSE meetings. • Ensuring full and complete HSEQ compliance with client and government regulations. • Ensure that the Well Delivery Process is followed. • Focal Point for MODU selection and Contracting. • Ensuring complete client satisfaction with AGR operations and that AGR carries out its operations to the highest required standard. • Recruitment of onshore and offshore personnel for the operations teams. • Management and selection of operational contractors and service companies. • Leading any required HSEQ incident investigation. • Ensures the MODU and support vessels are appropriately inspected, certified and fit for purpose. • Ensures effective emergency response arrangements are in place for the activity. • Ensures all Emperor Energy and contractor personnel are inducted and are aware of their activity-specific environmental responsibilities. • Ensures all required plans, audits and reviews are undertaken in accordance with the regulatory requirements and as required by the EP.
Drilling Superintendent	• Facilitates clear communications between Emperor Energy, MODU and support vessel contractors during operations from the AGR office. • Ensures compliance with this EP. • Leadership of the Incident Management Team (IMT) • Conducts incident investigations. • Provides daily feedback on operations progress to the Emperor Energy Chief Operating Officer. • Reports all incidents to the AGR Project Drilling Manager and Emperor Energy Chief Operating Officer.
Drilling Supervisor	• Implements the Drilling Program on a daily basis while onboard the MODU. • Ensures third-party compliance with AGR and Emperor Energy Policies, standards and the requirements of this EP.

ROLE	RESPONSIBILITY
	• Identifies any new or increased environmental impacts and risks (that are not addressed in this EP) and communicate these to the AGR Drilling Superintendent as soon as they are identified as part of the MoC process (see Section 8.10). • Ensures all staff and contractors understand their obligations with respect to the management of environmental risk and are appropriately inducted, trained and competent in work activities undertaken. • Reports environmental incidents to the AGR Drilling Superintendent. • Assumes the role of On-scene Commander upon activation of the OPEP. • Maintains clear communication between AGR and the MODU contractor.
HSE Manager	• Manages the preparation of HSE regulatory approvals documents excluding the EP which is prepared by the Emperor Energy Environmental consultant. • Provides technical input to the EP. • Arranges for review of the MODU and vessel contractors' HSE management systems upon contract award. • Prepares the Judith-2 Bridging Emergency Response Plan and OPEP. • Reports recordable and reportable incidents to Emperor Energy via Emperor Energy Well Advisor. • Assists with review, investigation and reporting of environmental incidents.
Offshore HSE Coordinator	• Supports the AGR Drilling Supervisor to ensure the execution of all HSE commitments under the Judith-2 Drilling EP, Safety Case Revision, WOMP and HSE Management Plan. • Supports the AGR Drilling Supervisor in incident investigation. • Provides HSE technical support to the Project and works with Rig HSE Officer.
MODU Contractor	
OIM	• Oversees all work activities and work programs ensuring work is undertaken in accordance with procedures, work instructions and in compliance with all legislative requirements and EP commitments. • Ensures all offshore personnel understand their obligations with respect to the management of environmental risk. • Ensures the MODU training matrix is fully implemented. • Ensure rig-entry HSE inductions are conducted. • Ensures waste disposal complies with MARPOL requirements. • Monitors closeout of non-conformances, corrective actions and audit recommendations.

ROLE	RESPONSIBILITY
	• Reports all incidents, near misses and dangerous occurrences to the AGR Drilling Supervisor in accordance with the incident reporting system. • Manages and coordinates offshore emergency response activities.
VSP contractor	• Maintains watch for cetaceans during VSP and implement CM14. • Implement the EPBC Act Policy Statement 2.1 - Part A (Standard Management Procedures) during VSP as part of CM13. • Records megafauna sightings and interactions during VSP and provides these to AGR at the completion of VSP.
All MODU personnel	• Undertake work activities with reasonable care and in accordance with EP commitments to ensure no adverse impacts to the environment. • Report all new hazards, incidents, near-misses and dangerous occurrences to immediate supervisor as soon as possible. • Participate in the development of work procedures through job safety analysis (JSA) development. • Participate in workplace inspections. • Maintain high housekeeping standards.
Support vessel contractor/s	
Vessel Master/s	• Ensure full compliance with all applicable navigational safety standards and regulations. • Conduct emergency drills. • Supervise vessel crew to ensure they are fit for duty and undertaking work only within their area of qualification and training. • Monitor, report and take appropriate action to remedy any vessel or equipment defects that may impact on safety and environmental performance of the vessel. • Maintain logs of emissions and discharges in accordance with MARPOL regulations. • Ensure that all crew are appropriately qualified, trained and equipped for their roles on the vessel. • Ensure the vessel activities are in compliance with the requirements of this EP. • Report all incidents and near-misses to the Vessel Manager and AGR Drilling Supervisor, recording the details and taking initial actions to render the situation safe.
Vessel Crew	• Apply operating procedures in letter and in spirit. • Follow good housekeeping procedures and work practices.

ROLE	RESPONSIBILITY
	• Attend all necessary toolbox talks and HSE inductions. • Encourage improvement in environmental performance wherever possible. • Immediately report environmental incidents or near-misses to their Supervisor / Vessel Master.

8.4. Environmental Management System

Whilst Emperor Energy is the Titleholder for the activity, contractors such as AGR and the MODU and vessel contractors maintain operational control as per the requirements of their management system.

8.4.1. Emperor Energy HSE Management System

The Emperor Energy HSE Management System (HSEMS) structure is summarised in its HSE Management System Manual. (APPENDIX A). The HSEMS will be employed and implemented at all phases of the project in order to demonstrate Emperor Energy's commitment to promoting the health and safety of personnel, protection of the environment and the quality of services in line with international best practice and standards.

Emperor Energy is committed to the establishment and ongoing implementation of the HSEMS in all of its project activities.

The HSEMS applies in full, without modification to all Emperor Energy-owned and operated sites, offices and locations where Emperor Energy has operational control. All Emperor Energy employees, contractors and visitors to Emperor Energy operated locations will be required to comply with this HSEMS.

When contractors and subcontractors have been engaged by Emperor Energy to perform work on its behalf, and have operational control, Emperor Energy requires the contractor to have their own HSEMS that meets or exceeds these requirements.

The HSEMS is structured in a hierarchy, with the Emperor Energy HSE Policy sitting at the top providing an overall statement regarding the importance of HSE and outlining key commitments and arrangements about how this will be achieved.

Supporting the HSE Policy is the HSEMS Manual, which provides details on the key tools and procedures will use to implement its HSEMS as well as act as a roadmap to the system for Emperor Energy and key contractor personnel.

There is a core set of corporate HSEMS policies and other system procedures that underpin the HSEMS, including:

- Hazard Identification and Risk Management
- Contractor HSE evaluation
- Incident reporting and investigation
- Document control
- Management of Change
- Crisis Management Plan

Emperor Energy has distinguished these procedures as core to the HSEMS, to ensure that key fundamental HSE processes are observed in all of Emperor Energy's activities, whether on project or non-project-based work.

8.4.2. AGR HSE Management System

AGR's management system is accredited with ISO 9001:2015 and ISO 14001:2015 and governs all of the group business as documented in the AGR Management System Manual (AGR-HSEQ-M-01).

AGR uses a standardised management system process to ensure that project activities are planned and managed efficiently and with due consideration to good oilfield practice, local and international standards as they relate to well design, operations planning, construction and then subsequent suspension or abandonment operations. This process is known as the AGR Well Delivery Process (WDP). The AGR WDP is a central component of the AGR Management System and is being used by Emperor Energy for this drilling activity.

The AGR WDP is primarily split into 5 phases, namely:

- Phase 1 Project Scoping – describes the process from initial client contact through to the submission and approval of a formal proposal and the contract management responsibilities between AGR and the client or titleholder.
- Phase 2 Initial Planning – describes the initial engineering planning and design work in order to identify and select a preferred option.
- Phase 3 Detailed Planning – describes the detailed engineering planning and design work to take the preferred option through to the detailed operations guidelines.
- Phase 4 Operations – describes how AGR manage their daily operations on behalf of the titleholder.
- Phase 5 Reporting and Review – describes how AGR analyse and report on the performance of the well and the planning.

8.4.2.1. Well Operations

The AGR WDP is supported by the AGR Well Standard (AP-WDP-S01), which details the standards that apply to all operations planned and conducted by AGR. These are the minimum standards to be applied to the well within AGR unless standards stipulated by local legislation are more onerous. All well operations will be planned and performed in compliance with applicable legislation, regulations, and industry guidelines.

The well is designed, constructed, and operated to maintain well life cycle integrity and to ensure prevention of major accidents in line with the AGR Corporate Major Accident Prevention Policy (CMAPP, AP-HSEQ-S04).

Safety and Environmentally Critical Elements (SECE) can be defined as installation and well equipment and systems (including software) whose purpose is to prevent, limit or control the effects of a major accident or environmental event, or whose failure could cause or increase the risk of a major accident or environmental event.

Within respect to well construction, AGR has identified the following SECE within its control and measures to assure its fitness for purpose:

- Drilling Fluids
- Casing

- Cement Fluids
- Wellheads
- BOP and Drill-string internal BOP
- MODU Selection and Intake
- Managing Shallow Gas Potential
- Weather and Sea State Conditions
- Well Abandonment.

Additional detail regarding the WDP is provided in the Judith-2 WOMP.

During the activity, AGR will identify any new or increased environmental impacts and risks (that are not addressed in this EP) and communicate these to the Emperor Energy COO as soon as they are identified as part of the MoC (see Section 8.10).

There are daily meetings, daily drilling reports, weekly meetings, and weekly reports between the AGR and Emperor Energy management teams to keep all management personnel appraised of project issues (technical or HSE) as they arise.

The alignment between Emperor Energy's and AGR's EMS components is summarised below in Table 8-2.

Table 8-2: Emperor Energy-AGR EMS Alignment

ISO14001:2015 FRAMEWORK	EMPEROR ENERGY	AGR ALIGNMENT
Environmental Policy		
Environmental policy	The Emperor Energy HSE Policy details Emperor Energy's commitment to the sustainable development of their assets. The HSE Policy is signed by the Executive Directors and is to be reviewed by them as part of the annual review. The HSE Policy is to be communicated to all Emperor Energy employees and contractors.	AGR is part of the ABL Group whose QHSE Policy, last revised in July 2023, is provided to all employees and contractors as part of their induction and is also provided on the company SharePoint site.
Planning		
Environmental aspects	An Environmental Aspects and Impacts Register has been developed by Emperor Energy during the preparation of the Judith-2 Exploration Drilling EP.	AGR has a corporate environmental aspects and risk register.
Legal and other requirements	Emperor Energy has prepared the activity-specific environmental legislative requirements addressed in this EP. The EP outlines various obligations of the titleholder which relates to the proposed drilling activities. The EP obligations are provided in	AGR has in place a corporate Legal Requirements Register.

ISO14001:2015 FRAMEWORK	EMPEROR ENERGY	AGR ALIGNMENT
	the Emperor Energy Legal Obligations Register.	
Objectives, targets and programs	Objectives have been set against the significant environmental aspects and recorded in an Environmental Objectives and Targets within the EP. The Annual HSEQ Objectives Register also lists actions, improvement programs and controls for achieving those objectives.	AGR has developed Annual HSEQ Objectives Register.
Implementation		
Resources, roles, responsibility and authority	The Emperor Energy roles, responsibilities and authority have been outlined in this EP.	AGR has an HSE Manager who is experienced in managing offshore petroleum activities and are responsible for advising the AGR Project Drilling Manager. They are also responsible for measuring and reporting on the performance against the EPO and EPS in this EP. Key subcontractor roles and responsibilities under AGR management are also outlined.
Competence, training and awareness	Personnel and contractors are required to have the training, qualifications and competencies appropriate with their roles and responsibilities.	AGR has defined competency and training requirements for each of its project team member roles.
Communication	The Emperor Energy Chief Operating Officer, AGR Project Drilling Manager, AGR Drilling Superintendent and HSE Manager attend weekly Project meetings to ensure that key environmental and stakeholder issues are identified and communicated to relevant project personnel to meet the EPOs and EPSs in this EP.	
Control of documents	The documents and records management process to detailed in the Emperor Energy Document Control procedure requires current versions of key documents are available and promptly removed from service when obsolete. HSE documents and records are to be stored in a manner that makes retrieval practicable.	The AGR Document and Data Control system is in use to ensure that all relevant controlled Judith-2 drilling design, planning and execution documents have a MoC process in place and that all changes go through a defined level of review and approval before being issued for use.
Operational control	The Emperor Energy Chief Operating Officer, AGR Project Drilling Manager, AGR Drilling Superintendent with the assistance of the AGR HSE Manager and the	

ISO14001:2015 FRAMEWORK	EMPEROR ENERGY	AGR ALIGNMENT
	Offshore HSE Coordinator, are responsible for the ensuring the EPOs and EPSs in this EP are communicated to and implemented by MODU and vessel personnel.	
Emergency preparedness and response	The Emperor Energy CMT forms to coordinate a company-wide strategic response to a crisis. Crisis events are those incidents which may threaten the company's reputation and/or the commercial viability of any of its activities/operations. A crisis may arise from a non-operational event (business) event, or from an operational emergency event threatening the safety and security of Emperor Energy personnel, stakeholders and/or the environment. The Emperor Energy Crisis Management Plan (CMP) has been prepared to support and contribute to this commitment, by providing a standard mechanism for the Emperor Energy CMT.	AGR is responsible for the preparation of the activity-specific ERP and OPEP and provides the Incident Management Team (IMT) resources required to manage any environmental incident and provides resources where required to the Emperor Energy CMT to manage any oil spill response effort.
Checking		
Monitoring and measurement	The Emperor Energy Performance Measurement and Monitoring process assesses HSE performance by gathering and analysing HSE data and reporting on performance. HSE information is effectively communicated as appropriate within Emperor Energy to ensure adjustments to priorities, updates to Management System and allocation of resources necessary to achieve HSE objectives. As part of the planning process for an activity, HSE data requirements are to be identified and processes put in place to obtain the appropriate data. This includes data required to be reported to regulators. The Emperor Energy Chief Operating Officer is responsible for reviewing HSE data to effectively manage performance.	The AGR HSE Manager, supported by the AGR Offshore HSE Coordinator, is responsible for preparing the required monitoring program to ensure the activity-specific EPOs are achieved. They are also responsible for communicating these to the AGR Drilling Superintendent, Project Drilling Manager and Emperor Energy Chief Operating Officer during the implementation phase.
Evaluation of compliance	The Emperor Energy COO is responsible for preparing the end-of-activity compliance report for submission to NOPSEMA.	The AGR HSE Manager supports the Emperor Energy compliance process by planning the drilling activity compliance assessment process and providing monitoring and audit reports to Emperor Energy on a timely basis.

ISO14001:2015 FRAMEWORK	EMPEROR ENERGY	AGR ALIGNMENT
Non-conformity, corrective and preventative action	Emperor Energy Incident Reporting, Investigation and Analysis is committed to preventing incidents and empowers personnel and contracts to "Stop the Job" if they feel there is a risk of harm to people, the environment, or assets. When incidents or near-misses occur, Emperor Energy will ensure that they are reported, recorded, investigated and actions implemented to prevent re-occurrence.	The AGR Incident Reporting and Investigation procedure (AGR-HSEQ-P05) and the Non-conformance and Corrective Action procedure (AGR-HSEQ-P03) will be used to record and manage all incidents and non-conformances with this EP. AGR will record all incidents and non-conformances in its GO Intranet as well as supply the information to Emperor Energy who will record the incident in the Incident and Action Tracking Register.
Control of records	The documents and records management process to detailed in the Emperor Energy Document Control procedure to ensure current versions of key documents are available and promptly removed from service when obsolete. HSE documents and records are to be stored in a manner that makes retrieval practicable.	The AGR Document and Data Control procedure will be used to record all supporting EMS documentation and records with copies supplied to Emperor Energy.
Internal audit	Emperor Energy undertakes audits to verify that legal and HSEMS requirements are being undertaken by the company and its contractors. Audits will be scheduled based on legal requirements, as identified in the Legal Obligations Register, or where there is a material risk to the company.	AGR has an internal audit schedule to ensure that the Well Delivery Process (WDP) is adhered to during activity management activities.
Management review	Emperor Energy Management reviews are conducted in a consistent and visible way as means of reviewing performance and effectiveness the HSEMS. Management reviews of environmental performance and of the implementation strategy should occur at planned intervals to ensure that the HSEMS is effective, adequate resources are available for implementing the EP and to identify and address any necessary changes to the management of environmental impacts and risks for the activity. An annual review is undertaken to evaluate the effectiveness of the HSEMS in delivering	AGR has an annual Management System Review in accordance with its ISO 14001 certification requirements. The AGR HSE Manager and AGR Offshore HSE Coordinator keep the Emperor Energy team informed of environmental issues for the planning and operations phase of the activity during weekly team meetings and internal reporting.

ISO14001:2015 FRAMEWORK	EMPEROR ENERGY	AGR ALIGNMENT
	performance outcomes and addressing any opportunities for improvement to the HSEMS. The aim of the review is to ensure that the HSEMS is effective, adequate resources are available for implementing the HSEMS and any legal requirements such as the EP and WOMP and to identify and address any necessary changes to the management of the company's impacts and risks. The annual management review is undertaken using the Management Review Form.	

8.4.3. MODU and Vessel Contractors

The MODU and vessel contractors will be required to have a HSEMS that meets the requirements of the Emperor Energy Policies as well as the requirements of the Emperor Energy and AGR contractor HSE selection process.

Contractors have specific duties as outlined in the EP and OPEP, and their local management will be specifically briefed on these obligations, as well as being provided with copies of the EP, the OPEP, and extracts of the EP commitment register that highlight their obligations.

Service companies and marine contractors providing the vessel are required to be included in general induction processes. Where their work provides some additional environmental risk (beyond that covered by existing processes), they will be briefed on the applicability of the EP to their operations and any performance requirement obligations.

Emperor Energy will use the following processes to share the responsibilities with the contractors to assess their capability:

- Campaign briefings.
- Desk-top exercises.
- Provision of copies of the EP and OPEP.
- Provision of EP commitment register.
- General contractor management (setting up contracts, the scope of work, face to face meetings).

Emergency response contractors are considered in the OPEP.

8.4.4. Chemical Assessment Procedure

All chemicals planned for use offshore must be assessed using the AGR Chemical Assessment Procedure. Chemical selection, evaluation and approval is undertaken prior to the activity commencing by the Environmental Manager, with input from subject matter experts as required.

The procedure ensures that:

- All relevant chemicals are assessed in accordance with the process

- All assessments are logged in the chemical assessment register
- The register is reviewed on an annual basis to ensure compliance with ongoing activities.
- The acceptance or rejection of chemicals that require ALARP justification is elevated to the Environmental Manager and/or senior technical representative.
- If sufficient environmental data on the chemical is not available to undertake the environmental assessment, the discharge of the product offshore will not be approved.

The process includes a chemical screening and, where applicable, a risk assessment process to ensure that the impacts and risks associated with the offshore discharge are reduced to ALARP.

The chemical screening process uses the OCNS (the OSPAR framework and CHARM risk assessment model) to evaluate the environmental impact of chemicals used offshore. Under this system, organic-based compounds are subject to the Chemical Hazard Assessment and Risk Management (CHARM) model which calculates the ratio of the Predicted Effect Concentration against the No Effect Concentration. This is expressed as a Hazard Quotient (HQ) and associated with a colour to rank the product and the level of hazard. Chemicals which are not applicable to the CHARM model (i.e. inorganic products, hydraulic fluid) are assigned an OCNS grouping A-E, with A having the greatest potential for environmental harm. Data used for both assessment models includes toxicity, biodegradation and bioaccumulation. Testing is carried out on the effect of the product on three different groups of aquatic organisms: algae, crustaceans and fish.

Results of the CHARM assessment / OCNS assessment are published by the OCNS and are used by in the Chemical Assessment Procedure to screen chemicals for use. The published list also includes product warnings (e.g. if a chemical contains heavy metals or has a substitution warning indicating that alternatives should be sought).

The Chemical Assessment Procedure is based on a two-step process, as follows. These steps ensure that the impacts and risks associated with offshore use and discharge are reduced to ALARP and meet the acceptability criteria

Step 1 – Chemical Screening

1) Gather chemical data, including chemical name and supplier, chemical SDS, estimated use, discharge and dosage.
2) Screen product for prohibited materials (including IChEMS Schedule 7 Register), validity of SDS / MSDS and presence of PLONOR components.
3) Identify whether product is listed on the OCNS Definitive Ranked List of Registered Substances.
4) If it is listed, record HQ Band or OCNS Group, and the presence of substitution or product warnings
5) If not listed, gather data on biodegradation, bioaccumulation and toxicity from other sources.

Chemicals with low or no potential for environmental impacts can be approved as a result of the screening step. Chemicals can be approved if they satisfy any of the following criteria:

- Zero planned discharge
- Pose Little of No Risk to the Environment (PLONOR) listed
- HQ Band Gold / Silver or OCNS Group E / D with no product or substitution warnings.
- Chemical is listed on the Australian Inventory of Industrial Chemicals (Inventory) under the Australian Industrial Chemicals Introduction Scheme (AICIS), or is not listed on the IChEMS Schedule 7 Register

Step 2 – Risk Assessment

If a chemical does not satisfy the approval criteria, AGR will consider whether there is a H&S and/or technical justification for using the product. If there is, then a risk assessment is required. As a minimum, this risk assessment will consider whether volumes, concentrations and discharge conditions are ALARP, whether alternative chemicals exist and are available for use, and whether the discharge of the chemical has an unacceptable level of environmental consequence.

If there is no justification for use, or if the risk assessment determines that discharge of the chemical is unacceptable, then the chemical will not be used, and an alternative must be selected.

A record of the Chemical Assessment Procedure, including steps followed and approvals for use, are recorded in the chemical register. The chemical register is held by Logistics and maintained for the duration of the activity. Any new or revised chemicals identified during the activity will be assessed before use.

The Offshore HSE Advisor will conduct offshore inspections throughout the activity on a weekly basis. These inspections will include a review of any new or changed chemicals that may be discharged offshore.

8.4.5. Whale Management Procedure

The Whale Management Procedure details the controls implemented to reduce impacts and risks to pygmy blue whale and southern right whales to ALARP and acceptable levels. The procedure applies to whales undertaking biologically important behaviours (i.e. foraging pygmy blue whale and migrating southern right whale), as the Operational Area overlaps with the relevant BIAs and Emperor Energy must ensure that activities are not inconsistent with the relevant conservation management plan (CMP) and national recovery plan for these species under the EPBC Act 1999.

Table 8-3 summarises the activity actions and mitigation measures outlined in the WMP. Further detail on these actions, including process flow diagrams, are provided in the WMP. Throughout the table, the following clarifications are made:

- "Absence of whales" means that no whales have been observed within the time limit, and/or whales have been observed leaving the survey zone.
- "Safe Point" means a pre-defined operational stopping/hold point in an activity where the operation can pause, shut down, or change what it's doing without creating unacceptable safety or well-integrity risk.
- For justification of size of survey zones, refer to Sections 5.7 and 5.8.

Activities can commence to the next safe point in low visibility or night-time (i.e., when observations cannot be undertaken) if:

- no more than three whales have been seen in the survey zone in the preceding daylight hours, and
- there was a two-hour period of no sightings in the survey zone.

The WMP also outlines the roles, responsibilities, and implementation of control measures related to adherence to *EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with Cetaceans*.

Activity actions (including pre-activity survey requirements) listed in Table 8-3 have been developed in a risk-based manner, consistent with the outcomes of the noise impact assessments (Sections 5.7 and 5.8). Mandatory pre-activity surveys are only assigned to activities where the predicted risk warranted additional controls, ensuring that the selected measures remain proportionate, effective, and aligned with ALARP and acceptability determinations.

Activities identified as generating elevated impulsive or continuous underwater noise levels—where real-time confirmation that no whales are present within the applicable observation zones is required prior to commencement—include:

- Geophysical survey – 2D survey
- Mobilisation, MODU positioning, demobilisation
- Drilling
- Resupply
- VSP
- Well P&A.

Conversely, some activities do not require activity actions (i.e. geotechnical survey) because the noise impact assessments (Sections 5.7 and 5.8) concluded that their underwater noise output is low, spatially limited, or expected to be indistinguishable from typical vessel noise at lower frequencies. For these activities, adherence to the vessel approach and distance requirements under the EPBC Regulations 2000 – Part 8 Division 8.1 (cetacean interaction requirements) is considered sufficient and appropriate to the level of risk.

Table 8-3: Summary of Activity Actions in WMP

ACTIVITY	RELEVANT SURVEY ZONE	PRE-START ACTION AND START CRITERIA	SAFE POINT	ACTION IF SIGHTING IS MADE AFTER ACTIVITY COMMENCEMENT
Geophysical survey - 2D survey	2D survey zone (1.5 km)	Prior to 2D survey commencement, visual monitoring will be undertaken of the 2D Survey Zone for 30 minutes by survey vessel with dedicated MFOs onboard. 2D survey activities can commence when absence of whales in the 2D Survey Zone is confirmed. Soft-start and shut-down procedures to be undertaken, as per *EPBC Act Policy 2.1*, where technically possible.	Survey complete	Continue monitoring from all appropriate in-field vessels. If whales are observed within the 2D Survey Zone while 2D survey is occurring, reduce thrusters if safe to do so.
Mobilisation, MODU positioning, demobilisation	MODU Positioning Zone (5.5 km)	Prior to MODU positioning, visual monitoring will be undertaken of the MODU Positioning Zone for 30 minutes by support vessel with dedicated MFOs onboard. MODU positioning can commence when absence of whales in the MODU Positioning Zone is confirmed.	Positioning complete	If a sighting is made within the MODU Positioning Zone while positioning is taking place, vessels will reduce thrusters if safe to do so. Positioning will pause as soon as it is safe to do so and will only recommence when absence of whales in the MODU Positioning Zone is confirmed.
Drilling	Drilling Zone (3.5 km)	Survey Drilling Zone prior to commencement of drilling and at each Safe Point for 30 minutes by support vessel with trained Vessel Officer of the Watch. Only proceed to next Safe Point when absence of whales in the Drilling Zone is confirmed.	Next positive test of well integrity (e.g. after cementing each casing).	If sighting is made within the Drilling Zone while drilling is taking place, proceed to next Safe Point. Once well integrity has been confirmed, implement noise minimisation actions as relevant, and with regards to safety: • reduce load on mud pumps and rotary drilling equipment • reduce load on generators.

ACTIVITY	RELEVANT SURVEY ZONE	PRE-START ACTION AND START CRITERIA	SAFE POINT	ACTION IF SIGHTING IS MADE AFTER ACTIVITY COMMENCEMENT
Resupply	Resupply Zone (5.5 km)	Prior to commencing resupply, visual monitoring will be undertaken of the **Resupply Zone** for 30 minutes by support vessel with trained Vessel Officer of the Watch. Resupply can only commence when absence of whales in the **Resupply Zone** is confirmed.	Resupply complete	Continue monitoring from all appropriate in-field vessels. If whales are observed within the **Resupply Zone** while resupply is occurring, reduce thrusters if safe to do so.
VSP	VSP Zone (3 km)	Prior to commencing VSP, visual monitoring will be undertaken of the **VSP Zone** for 30 minutes by support vessel with dedicated MFOs onboard. VSP can only commence when absence of whales in the **VSP Zone** is confirmed. Soft-start and shut-down procedures to be undertaken, as per *EPBC Act Policy 2.1*.	VSP complete	Continue monitoring from all appropriate in-field vessels. If sighting is made within the **VSP Zone** while VSP is taking place, proceed to next Safe Point.
Well P&A	P&A Zone (3.5 km)	Prior to commencing P&A activities, visual monitoring will be undertaken of the **P&A Zone** for 30 minutes by support vessel with trained Vessel Officer of the Watch. P&A can only commence when absence of whales in the **P&A Zone** is confirmed.	Next positive test of well integrity.	If sighting is made within the **P&A Zone** while P&A is taking place, proceed to next Safe Point.

8.5.Competency, Training and Awareness

8.5.1. Competency and Training

A competent, fully resourced organisation, MODU and vessels are a key component to ensure all personnel are aware of environmental obligations.

The Emperor Energy HSEMS provides information for the effective management of contractors to ensure EHS performance for the life cycles of the contract, from the contractor selection process through to post-contract performance. The roles that require formal industry-recognised qualifications will be identified and the suitable certificates will be verified through audit of training records prior to the commencement of the activity. Certifications will be recorded in Emperor Energy's and its contractor records systems.

Environmental performance monitoring and audit (Section 8.11) will be used to ensure compliance and demonstrate competency. Where incidents or non-conformances are identified, corrective actions to prevent reoccurrence will address, where appropriate, competency issues such as the need for additional training and awareness.

8.5.1.1. Contractor Competency

AGR will conduct a due diligence review during the contractor selection process to ensure that the chosen MODU and vessel contractors have policies and procedures in place to ensure the correct selection, placement, training, and ongoing assessment of employees, with position descriptions (including a description of HSE responsibilities) for key personnel being readily available.

This process is addressed in AGR's Contractor Evaluation Procedure (AGR-LCSM-P-02) procedure which focuses on areas of policies, organisation, risk assessment planning and performance.

8.5.1.2. AGR Personnel Competencies

AGR's Wells Competency Management System (AP-WDP-M16) describes how it manages the competence of individuals and teams to carry on their work and associated risks. This includes staff, consultants, associates, and third-party suppliers.

Importantly, this system specifies the roles and responsibilities and qualifications and training requirements for safety and environmentally critical positions (SECP) including the Drilling Supervisor, HSE Manager, Principal Engineer, Senior Completions Engineer and so forth. Position-specific competence matrices are available for these roles and are used to guide and record assessments of skills.

8.5.1.3. Drilling Supervisors

AGR's Operations Supervision Manual (AP-WDP-M13) provides detailed guidance for all AGR Well Management Supervisors (i.e., Drilling Supervisors) to ensure that drilling is undertaken in accordance with AGR standards and policies. It specifies that people in this role have a Subsea Supervisor International Well Control Certificate, offshore survival training, industry safety training, oil spill training and offshore medical training at a minimum. This manual provides the minimum standards required to ensure well control is maintained, and provides specifications for optimising drilling parameters, adequate bulk and drilling fluids, coring operations, casing/wellhead operations, cementing, formation strength tests, wireline logging, well testing and completions, and well abandonment.

8.5.2. Environmental Induction and Awareness

Each member of the project team responsible for the implementation of task-specific control measures during operational activities shall be aware of their specific responsibilities detailed in this EP as per Regulation 22(3)(4) of the OPGGS(E) Regulations. People who hold responsibilities relating to the implementation of this EP are hired by Emperor Energy on the basis of their particular qualifications, experience, and competencies.

Personnel with specific responsibilities under this EP will be made aware of the environmental requirements via a project-specific induction prior to commencing the activity.

8.5.2.1. Activity-specific Induction

An activity-specific HSE induction for all personnel working on the activity will be undertaken prior to commencement of the geophysical and geotechnical surveys and the drilling campaign. This is likely to take place during a pre-activity meeting, with additional inductions to account for crew change overs undertaken on the vessels (if required) and the MODU. This induction fosters environmental stewardship amongst all personnel and ensures that they are aware of the control measures implemented to minimise the impacts and risks to the environment, before commencing operations.

The environmental component of the induction will include information on the following environmental issues:

- Awareness of Emperor Energy HSEMS.
- Description of the environmental sensitivities, conservation, and heritage values of the Operational Area.
- An outline of the control measures in this EP to achieve the environmental performance outcomes.
- Importance of following procedures and using JSAs to identify environmental risks and mitigation measures.
- Procedures for responding to and reporting environmental hazards or incidents.
- Overview of emergency response and spill management procedures.
- Overview of the waste management requirements.
- Roles and environmental responsibilities of key personnel aboard the MODU and vessels.

The Emperor Energy Site Supervisor onboard the geophysical and geotechnical vessels and the AGR Drilling Supervisor is responsible for ensuring personnel receive this induction prior to the commencement of the activity and will be supported by the Offshore HSE Coordinator. All personnel are required to sign an attendance sheet to confirm their participation in and understanding of the induction.

8.5.2.2. Facility-specific Induction

The MODU and vessel contractors will conduct their own company and vessel-specific inductions independently of the activity-specific HSE induction.

8.5.3. Oil Spill Response Training

Emperor Energy is committed to ensuring that personnel within the CMT, IMT and field operations are properly trained and competent to perform their assigned duties. All staff allocated roles within the CMT must be fully conversant with their responsibilities as defined in this EP and OPEP. Independent training, certification and readiness assessments are provided for CMT personnel.

All individuals with defined responsibilities under the Emperor Energy CMT Plan will receive appropriate training and ongoing development that aligns with the level of accountability and decision making associated with their role.

During its contractor audit process, Emperor Energy will assess the MODU and vessel contractors' implementation of their SMPEPs (or equivalent, relevant to class).

Oil spill response training and competencies are detailed in Section 7.2 of the Judith-2 Exploration Well OPEP and oil spill response exercises will be conducted as detailed in Section 7.3 of the Judith-2 Exploration Well OPEP.

8.5.4. Toolbox Talks and HSE Meetings

Environmental matters will be included in daily toolbox talks as required by the specific task being risk assessed (e.g. waste management).

Environmental issues will also be addressed in daily operations meetings and weekly HSE meetings, where each shift will participate with the AGR Drilling Supervisor, Offshore HSE Coordinator and support vessel Masters in discussing HSE matters that have arisen in the previous week, and issues to consider for the following week. Given the anticipated short duration of the geophysical and geotechnical surveys (see Section 3.3.2), environmental issues will be addressed in daily operations meetings (there will not be weekly HSE meetings).

Records associated with activity-specific training, environmental training, inductions and attendance at toolbox meetings will be recorded and maintained on board the vessel.

8.5.5. Communications

Emperor Energy maintains an Emergency and Operational Contact Directory (EOCD) to ensure all stakeholders can be reached before any operations begin and during emergency situations. The directory will be active throughout the operational and response phases and consists of a centralised, secure database capturing essential details such as organisation name, contact person, role or responsibility, phone numbers, email addresses, emergency contacts, preferred communication method, and the date of last verification.

The database is cloud-based for accessibility and backed up offline for use in remote locations. Access is controlled, with full editing rights assigned to the Emperor Energy Chief Operating Officer and relevant Project Team members and read-only access for field supervisors and emergency coordinators. Updates occur monthly, with verification through direct communication and all changes logged to maintain an audit trail.

For effective emergency management, all emergency response contacts are separated into a dedicated section within the directory. This section prioritises critical stakeholders such as emergency services, regulators, spill response contractors, and medical providers. Escalation pathways and 24/7 availability indicators are clearly marked to ensure rapid access during high-pressure situations.

The directory integrates with notification protocols, ensuring stakeholders are informed at least four weeks prior to planned activities and enabling immediate escalation during emergencies. Continuous improvement is supported through monthly review meetings and a feedback loop for correcting outdated information. By maintaining accurate and accessible contact details, Emperor Energy ensures contractual obligations are met and response actions are effective.

The site survey contractors, MODU contractor, support vessel Masters and AGR Drilling Supervisor are jointly responsible for keeping their personnel informed about HSE issues, acting as a focal point for personnel to raise issues and concerns, and consulting and involving all personnel in the following:

- Issues associated with the implementation of the EP.
- Any proposed changes to equipment, systems, or methods of operation of equipment, where these may have HSE implications.
- Any proposals for the continuous improvement of environmental protection, including the setting of environmental objectives and training schemes.

Table 8-4: Key Meetings Proposed to Take Place Onshore and Offshore During the Activity

MEETING	INDICATIVE FREQUENCY	ATTENDEES
Onshore		
Emperor Energy AGR Project Management	Daily	• Emperor Energy – Managing Director, COO, Project Geologist, Environmental Manager • AGR – Drilling Project Manager, Drilling Superintendent, Senior Drilling Engineer, Logistics Superintendent, HSE Manager, Drilling Supervisor, HSE Coordinator • MODU - OIM • Vessels – Masters • Third Party Contractors – as required depending on phase.
Offshore		
Operations	Daily	Site surveys – Site Supervisor, Party Chief Drilling - OIM, MODU Department Heads, AGR Drilling Supervisor, HSE Coordinator
Pre-start safety meeting Toolbox	Daily, prior to each shift	All personnel
HSE	Weekly	All personnel
Pre-start safety meeting Toolbox	As required, based on identified safety issues	Task personnel

8.6. Environmental Emergencies and Preparedness

In the event of an emergency of any type, the site survey vessel Masters, MODU OIM and support vessel masters will assume overall onsite command and act as the Emergency Response Coordinator (ERC). All persons aboard will be required to act under the ERC's directions. The AGR Drilling Supervisor will maintain communications with the IMT in the event of an emergency involving an oil spill, who will then liaise with the Emperor Energy CMT. Oil spill emergency response support will be provided by the IMT. Overall emergency management will be via AGR's IMT based in AGR's office during program execution. For further details refer to Chapter 3 of the Judith-2 Exploration Drilling OPEP.

8.6.1. Adverse Weather Protocols

It is the duty of the site survey vessel Masters, MODU OIM and the support vessel Master to act as the central point for all actions and communications with regards to any emergency, including response to extreme weather or sea state, to safeguard the vessel, all personnel onboard, and the environment.

During adverse weather, vessel Masters and the MODU OIM are responsible for the following:

- Ensuring the safety of all personnel onboard.
- Monitoring all available weather forecasts and predictions.
- Initiating the safety management systems, HSE procedures and / or ERP (Emergency Response Plan).
- Keeping the AGR Drilling Supervisor fully informed of the prevailing situation and intended action to be taken.
- Assessing and maintaining security, watertight integrity, and stability of the MODU and vessels.
- Proceeding to identified shelter location(s) as appropriate.

Other appropriate responsibilities shall be taken into consideration as dictated by the situation.

In addition to using Very High Frequency (VHF) Marine Radio Weather Services, the site survey vessel contractors, MODU and support vessel contractors will obtain daily weather forecasting from the Bureau of Meteorology to monitor weather within the operational area in the lead up to and for the duration of the activity.

8.6.2. MODU and Support Vessel Emergencies and Oil Spills

Activity-specific emergency response procedures will be included in the site survey, MODU and drilling support vessel contractors' ERPs. The ERPs will contain instructions for MODU and support vessel emergency, medical emergency, search and rescue, reportable incidents, incident notification and emergency contact information.

AGR will ensure that the MODU and vessel contractors have appropriate emergency plans in place for all relevant environmental emergency events (including the assignment of emergency management roles for particular events). Environmental emergencies that will be considered will include (but not be limited to):

- Introduction of animal diseases into aquaculture (no aquaculture operations in or around operational area).
- IMS incursions (addressed in this EP).
- Cetacean stranding and vessel strike (addressed in this EP).

- Maritime casualties, requiring salvage and intervention, emergency towage and requests for a place of refuge.
- Marine pollution from floating or sunken containers of hazardous materials.
- Debris originating from a maritime casualty.
- Physical damage caused by vessels.
- Fire or explosion on the vessel.
- Hijack/terrorism.
- Adverse weather.

SMPEPs and ERPs typically include MODU- and vessel-specific procedures for the following:

- Fire and explosion.
- Incidents – collision, grounding, hull damage, man overboard, equipment failure.
- Helicopter crash.
- Waste management.
- Hazardous materials and handling.
- Hydrocarbon and chemical spills.

The SMPEP includes information about initial response, reporting requirements and arrangements for the involvement of third parties having the appropriate skills and facilities necessary to respond effectively to oil spill issues. The MODU ERP and vessels' SMPEPs will be the principal working documents for the MODU and vessel crews in the event of a marine oil spill incident. These documents will include specific emergency procedures including steps to control discharges for bunkering spills, hull damage, grounding and stranding, fire and explosion, collisions, MODU/vessel list, tank failure, sinking and vapour releases. The SMPEP also includes requirements for regular drills of the plan and revision following drills or incidents.

The Judith-2 Exploration Well OPEP will be implemented (and supplements the MODU and support vessel-specific SMPEPs) in the event of a Level 2 or Level 3 hydrocarbon spill that requires response resources beyond those immediately available to the MODU or vessels. The Judith-2 Exploration Well OPEP details the response actions aimed at minimising the impacts of subsea well loss of containment or an MDO spill on sensitive resources.

The MODU OIM and all vessel Masters will ensure that their crews are fully aware of their requirements and that exercises for MODU or vessel-related incidents are conducted.

8.6.3. Emergency Response Training

8.6.3.1. Activity-specific training

The readiness and competency of Emperor Energy, AGR, MODU contractor and vessel contractors (site surveys and drilling support) to respond to incidents and emergencies will be tested by conducting a desktop emergency response exercise as detailed in Section 7 of the Judith-2 Exploration Well OPEP.

The scenario chosen may combine an emergency with risk to human life (such as fire) and risk to the environment (large hydrocarbon spill). This way several plans (i.e., the ERP and OPEP) can be tested simultaneously.

8.6.3.2. MODU-specific training

The MODU OIM is responsible for ensuring that personnel fulfilling emergency response roles are competent in crisis and emergency procedures related to the protection of health, safety, environment and integrity. The level of training and associated competency demonstration is dependent on individual roles in a crisis or emergency situation.

The MODU OIM is also responsible for ensuring relevant personnel undertake oil spill preparedness and response training in line with the MODU's personnel training and qualifications matrix. This includes identification and development of approved competency and non-competency-based courses and ensuring training is undertaken to schedule and records are maintained.

8.7. Recording and Reporting

8.7.1. Internal Recording and Reporting

Routine internal recording and reporting of activity HSE matters will encompass the following:

- Daily teleconferences;
  - Site surveys – held between the Site Supervisor, Party Chief, AGR and Emperor Energy personnel each morning for an update on progress from the previous day and the forward plan, including any HSE matters that have arisen.
  - Drilling – held between the MODU OIM, Vessel Masters, AGR, and Emperor Energy personnel each morning for an update on progress from the previous day and the forward plan, including any HSE matters that have arisen.
- Daily operations reports;
  - Site surveys - the Site Supervisor will prepare a Daily Operations Report, including data on activities conducted for the day and any HSE issues arising and distributed to the extended project team.
  - Drilling - the AGR Drilling Supervisor will prepare a DDR, including data on activities conducted for the day and any HSE issues arising and distributed to the extended project team.
- HSE reporting – for the site surveys and drilling, the AGR Offshore HSE Coordinator will collate key HSE performance statistics on a daily basis and report those to the wider project team during daily teleconferences.

8.7.2. External Recording and Reporting

Routine external recording and reporting of activity HSE matters to be undertaken by Emperor Energy are detailed in Table 8-5. Activity notification and stakeholder requirements are detail in Section 7.9 and incident reporting requirements are detailed in Section 8.7.3.

Table 8-5: External Routine Reporting Requirements

REQUIREMENT	TIMING	DETAILS
Activity environmental	Within 3 months of	An environmental performance report that details the outcomes of each EPO and EPS in the EP (in accordance with OPGGS(E)

REQUIREMENT	TIMING	DETAILS
performance report	completion of all activities	Regulation 51) will be submitted to NOPSEMA within 3 months of completion of all activities.
Provide marine fauna observation data to DCCEEW	Within 3 months of completion of all activities	If relevant data recorded, upload information via the online National Marine Mammal Data Portal which includes the Australasian Right Whale Photo-Identification Catalogue (ARWPIC) and the Vessel / Whale Collisions (ship strike) database. https://data.marinemammals.gov.au/report/sighting For surveys upload recorded data via the online Cetacean Sightings Application https://data.marinemammals.gov.au/csa

8.7.3. Incident Recording and Reporting

All environmental near-misses and incidents, including non-compliance with the EP EPOs and EPSs, must be communicated immediately to AGR's HSE Manager, who will report to the Emperor Energy COO. The expectation of incident reporting will be reinforced at inductions, daily toolbox meetings and weekly HSE meetings.

All environmental near-misses and incidents will be recorded in the AGR incident management system. Reporting time frames are detailed in Table 8-6. The MODU OIM and/or Vessel Master will lead an investigation into the cause, effects, and learnings of the incident as per the contractor's investigation procedures. Where circumstances warrant it, an investigation will be conducted jointly with the AGR Drilling Supervisor. Following an investigation, the MODU and/or vessel contractor and Emperor Energy will develop remedial actions and communicate these to project personnel (and broader organisations, as appropriate) to prevent a recurrence. Incident recording and reporting actions will be tracked to completion.

The OPGGS(E) Regulations defines the following incident types:

- Recordable incident, for an activity for which there is an EP in force, means a breach of an EPO for the activity, or an EPS relating to the activity, that is not a reportable incident.
- Reportable incident, for an activity, means an incident relating to the activity that has caused, or has the potential to cause, moderate to significant environmental damage.

Emperor Energy interprets 'moderate to significant' environmental damage as being those hazards identified through the impact and risk assessment process (Section 5) as having an inherent or residual impact consequence of 'medium', 'significant' or 'high', or an inherent or residual risk ranking of 'significant' or 'high.' Impacts and risks with these ratings (as outlined throughout Section 5) are:

- Introduction of IMS
- Accidental Release - Vessel Collision
- Accidental Release – Loss of Well Control.

As such, incidents relating to these matters are defined as reportable incidents.

Part 5 of the OPGGS(E) describes the requirements for verbal notifications and written reporting of recordable and reportable incidents. Table 8-6 outlines the incident reporting obligations that Emperor Energy will undertake with external organisations.

Table 8-6: Incident Reporting Requirements

RECORDABLE INCIDENT REPORTING – REGULATION 50	
Legislative definition of 'recordable incident': *'Recordable incident, for an activity for which there is an environment plan in force, means a breach of an environmental performance outcome for the activity, or an environmental performance standard relating to the activity, that is not a reportable incident.'*	
REPORTING REQUIREMENTS	**REPORT TO / TIMING**
Written notification to NOPSEMA by the 15th of each month. As a minimum, the written incident report must describe: • All material facts and circumstances concerning the recordable incident that the titleholder knows or is able, by reasonable search or enquiry, to find out; and • Any action taken to avoid or mitigate any adverse environmental impacts of the recordable incidents; and • The corrective action that has been taken, or is proposed to be taken, to stop, control or remedy the reportable incident; and • The action that has been taken, or is proposed to be taken, to prevent a similar incident occurring in the future. If no recordable incidents have occurred during any particular month, a recordable incident report is not required.	Submit written report to NOPSEMA by the 15th of each month.
REPORTABLE INCIDENT REPORTING – REGULATION 50	
Legislative definition of 'reportable incident': *'Reportable incident, for an activity, means an incident relating to the activity that has caused, or has the potential to cause, moderate to significant environmental damage'* Therefore, reportable incidents under this EP are those unplanned events that have a severe or greater impact severity or medium or greater risk level. In accordance with this definition, the reportable incidents identified under this EP are: • Introduction of IMS • Accidental Release - Vessel Collision • Accidental Release – Loss of Well Control	

REPORTING REQUIREMENTS	REPORT TO / TIMING
Verbal notification that must contain: • All material facts and circumstances concerning the incident. • Any action taken to avoid or mitigate the adverse environmental impact of the incident. • The corrective action that has been taken or is proposed to be taken to stop control or remedy the reportable incident. Verbal notification of a reportable incident to the regulator must be followed by a written report. As a minimum, the written incident report will include: • The incident and all material facts and circumstances concerning the incident. • Actions taken to avoid or mitigate any adverse environmental impacts. • The corrective actions that have been taken, or may be taken, to prevent a recurrence of the incident. • The action that has been taken or is proposed to be taken to prevent a similar incident occurring in the future.	Verbal notification within two hours of the incident occurring or becoming aware of the incident. Report verbally to NOPSEMA within two hours or as soon as practicable and provide written record of notification by email. Phone: 1300 674 472 Written report to be provided to NOPSEMA not later than 3 days after the first occurrence of the incident. Email: submissions@nopsema.gov.au Written report to be provided NOPTA and Vic DJPR within 7 days of written report submission to NOPSEMA. Email: reporting@nopta.gov.au Email: marine.pollution@ecodev.vic.gov.au

ADDITIONAL REPORTING REQUIREMENTS

REPORTING REQUIREMENTS	REPORT TO
All discharges /spills or probable discharges/spills to the marine environment of oil or oily mixtures, or noxious liquid substances in the marine environment from vessels. Reporting info: http://www.amsa.gov.au/forms-and-publications/AMSA1522.pdf	Immediate notification by the Vessel Master to AMSA. Follow-up with Marine Pollution Report (POLREP). Phone: 1800 641 792 Email: rccaus@amsa.gov.au AMSA POLREP: https://amsa-forms.nogginoca.com/public/
In the event an AMP may be exposed to hydrocarbons. Notification must be provided to the Director of National Parks and include: • Titleholder details. • Time and location of the incident including name of marine park likely to be affected.	Verbal notification ASAP. 24 hr Marine Compliance Duty Officer Phone: 0419 293 465

	• Proposed response arrangement. • Confirmation of providing access to relevant monitoring and evaluation reports when available. • Contact details for the response coordinator.
Death or injury to an EPBC Act Listed Species as a result of the petroleum activity	Report within seven business days to DCCEEW. Phone: 1800 803 772 Email: EPBC.Permits@environment.gov.au
Vessel collision with marine mammals (whales)	ASAP for cetacean injury assistance report to Whale and Dolphin Emergency Hotline Phone: 1300 136 017 Within 72 hours report to DCCEEW – online National Ship Strike Database https://data.marinemammals.gov.au/report/shipstrike
Presence of any suspected marine pest or disease within 24 hours	Verbal notification ASAP. Email: marine.pests@agriculture.vic.gov.au Phone: 136 186
Identification of underwater cultural heritage, including First Nations underwater cultural heritage.	Written notification within 1 week. Written notification via the notification of discovery of an historic shipwreck or relic online submission form. https://environment.gov.au/shipwreck/public/forms/notification.do?mode=add Within 21 days of discovery of a First Nations underwater cultural heritage, a written notice to the Minister (via DCCEEW) will be submitted and will include a description of the item and a description of the location sufficient to relocate it.

8.8.Compliance Management

Emperor Energy will maintain a Compliance Register to track commitments made across all regulatory approvals, including this EP and OPEP. The Compliance Register and evidence documentation will be stored on the Emperor Energy SharePoint system. Evidence documents will be traceable to their specific compliance tasks.

Compliance tasks will be raised for each commitment, EPO, CM, EPS or reporting requirement as detailed in each of the regulatory approvals.

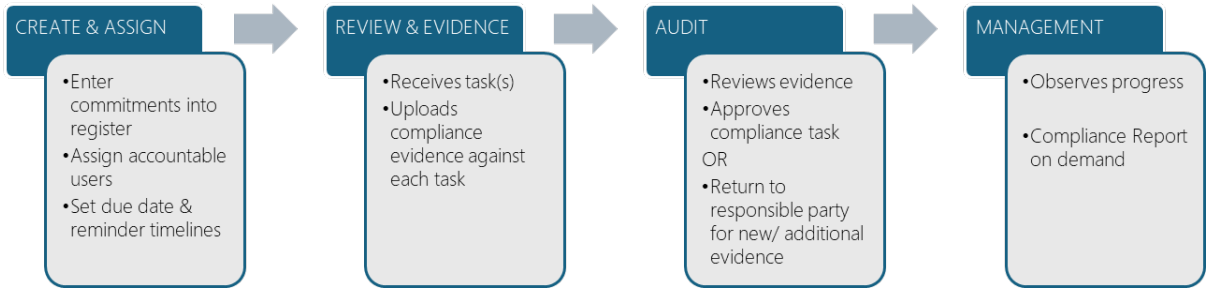


Figure 8-3: Emperor Energy compliance management workflow

As outlined in Section 8.3, the Emperor Energy COO is accountable for the Company's Compliance Management System. The intent of the Compliance Management System is tracking Emperor Energy, AGR and service partners compliance with the commitments made within this EP, OPEP and other regulatory approvals. The COO is supported by the specialist expertise of the Emperor Energy Environmental Manager, who will evaluate the supplied evidence against each EPS, EPO or MC within this EP.

8.9. Record Keeping

In accordance with Regulation 52 of the OPGGS(E) Regulations, Emperor Energy will store all records relevant to the EP, , on its document control system (Microsoft SharePoint) when:

- the EP is in force for the duration of the activities.
- for 5 years beginning on the day that the EP ceases to be in force for the activity.

As per Regulation 53 of the OPGGS(E) Regulations, records will be retrieved from Emperor Energy SharePoint system and made available in a reasonably practicable time frame or such as:

- in the case of an emergency relating to an activity – as soon as possible at any time of the day or night on any day during the emergency; or
- in any other case – during normal business hours on a business day in the place where the document or record is kept.

Records will be made available to NOPSEMA in either electronic or printed form upon request.

8.10. Management of Change

8.10.1. Changes to EP Scope

Identification and potential approval of changes to scope (e.g. timing or operational details described in this EP) is the responsibility of Emperor Energy COO, in conjunction with the AGR Project Manager. A risk assessment will be undertaken for any change in scope to assess the potential impacts of the change. If the change represents a significant modification that is not provided for in the accepted EP in force for the activity, a revision of the EP will be conducted in accordance with Regulation 39 of the OPGGS(E) Regulations.

Emperor Energy's Management of Change (MoC) provides direction for management of change for Emperor Energy's activities. It shall be used to ensure changes to approved work programs (e.g. systems, legislation, procedures, equipment, products, materials and planning etc.) are appropriately considered, and approved if acceptable, by the appropriate personnel.

8.10.2. Emperor Energy MoC Process

Adjustments to management systems, approved work programs and any related information (e.g. details of the environment and legislative requirements) are to be routinely reviewed and assessed to identify and manage internal implications and to be approved if acceptable. Relevant changes are required to be assessed to ensure that new or increased company or HSE impacts and risks are identified and managed.

Relevant changes include:

- New activities, assets, equipment, processes, or procedures proposed to be undertaken or implemented that have company or HSE impacts or risks and have not been.
  - Previously assessed, in accordance with the requirements of the Emperor Energy HSEMS.
  - Authorised in the Emperor Energy HSEMS or existing approvals, management plans, procedures, work instructions, or other plans.
- Proposed changes to activities, assets, equipment, processes, or procedures that have the potential to impact on the company, people, the environment, community, or stakeholders.
- Changes to requirements of an existing external approval such as the WOMP and/or EP.
- New information or information changes from research, stakeholders, legal and other requirements, and any other sources used to inform internal processes, procedures or decisions and external approvals such as the EP.

Relevant changes are to be assessed using the MoC Form. If a change is identified that is relevant to an accepted EP, the MoC Procedure will be followed, to determine if the change triggers a legislative requirement to resubmit the EP.

8.10.3. AGR MoC Process

Emperor Energy will utilise the AGR MoC (AP-WDP-M 09) for all changes in activity throughout the planning and drilling of the Judith 2 exploration well. This will include changes to regulatory documentation such as this EP, any changes to the Project that may impact environmental performance, any new environmental impacts, and risks, and will evaluate if there is any impact from these changes that may trigger a revision to the EP. AGR, in conjunction with the Emperor Energy Chief Operating Officer, will ensure any changes triggering an EP revision as per the OPGGS(E) Regulations are captured as part of the MoC process. Emperor Energy has evaluated AGR's MoC procedure and verified that it meets its requirements as the Titleholder and the OPGGS(E) Regulations.

The process is applied after the approval of the Detailed Drilling Guidelines to all changes and deviations for the activity until the completion of activity.

Permanent or temporary changes to organisation, equipment, plant, standards, or procedures that have potential HSE and/or integrity impacts are subject to formal review and approval prior to initiating the change to ensure impacts and risks remain acceptable and are reduced to ALARP. The level of management approval for each change is commensurate with the risk.

Changes are classified as minor, significant, or major and are described below.

8.10.3.1. Minor Change

A minor change is a change to an approved plan, work program (or a procedure referenced in it) that has no safety, environmental or well integrity implication, adds less than AUD$100,000 to the cost of the operation and has no impact on the operation's objectives (e.g. additional core sample/s).

Minor changes to the activity will be discussed and agreed at the daily operations meeting. All activity changes will be confirmed by email from the AGR Drilling Superintendent, or designate, to the AGR Drilling Supervisor.

When operations are being conducted, the AGR Drilling Superintendent must provide approval. All minor changes must be confirmed via email and approved by the AGR Drilling Superintendent.

8.10.3.2. Significant Change

A significant change is defined as a change to an approved plan or work program that does not impact the operation's objectives but could have a direct implication to safety, the environment (i.e., increase in impact or risk profile above that of the originally planned program), and/or increase the cost of the operation by more than AUD$100,000 but less than AUD$250,000.

Significant changes to the plan or programme, or significant operations not included in the program, will be discussed, impact and risk will be assessed and agreed by the onshore and offshore teams and confirmed in writing with an approved Program Supplement or Amendment. This will be issued prior to commencing the change in program. The AGR Drilling Superintendent will discuss the proposed change with the Emperor Energy Chief Operating Officer, the MODU Manager/OIM and the Vessel Masters. The Supplement or Amendment is developed by the relevant engineer and approved by the AGR Drilling Superintendent, AGR Project Manager, or his delegate and the Emperor Energy Chief Operating Officer and issued to the team.

All changes will be assessed to ensure any new impacts or risks, or significant change in impact or risk level, are identified.

If the change influences environmental aspects of the activity, the Emperor Energy Chief Operating Officer and the AGR HSE Manager must be consulted to determine whether an EP revision is triggered and to follow Emperor Energy's process for environmental change.

Following this MoC process, Emperor Energy will assess and undertake the necessary revision/resubmission of the EP as described in Section 8.10.1 assisted by the AGR project team as required.

8.10.3.3. Major Change

A major deviation from plan that results in a deviation from the Judith-2 exploration drilling activity, Emperor Energy policies and standards, has a direct safety or environmental implication (i.e., an increase in risk profile above that of the originally planned program), an EP revision being triggered, the design of the investigation program changing and/or will result in the Authority for Expenditure being exceeded.

Changes affecting the approved activity require an approved Program Supplement or Amendment to be issued. The AGR Drilling Superintendent will discuss the proposed change with the Emperor Energy Chief Operating Officer, AGR Drilling Project Manager and the MODU Manager/OIM. The Supplement or Amendment is developed by the relevant engineer and approved by the Emperor Energy Chief Operating Officer and the AGR Drilling Project Manager, or his delegate.

Exceptionally, if conditions demand an immediate response to safeguard the MODU or a vessel, then the AGR Drilling Supervisor is authorised to implement any necessary changes to the program with the

agreement of the MODU Manager/OIM or Vessel Masters. Contact with the AGR Drilling Superintendent or their delegate should be made as soon as reasonably practicable. A Programme Supplement or Amendment should be prepared the next working day.

All changes are assessed to ensure any new impacts or risks, or significant changes in risk level are identified.

If the change influences the activity's environmental aspect, the Emperor Energy Chief Operating Officer and the AGR HSE Manager must be consulted to determine whether an EP revision is triggered.

Following this MoC process, Emperor Energy will assess and undertake the necessary revision/resubmission of the EP as described in Section 8.10.1 assisted by the AGR project team as required.

8.11. Monitoring and Audit

8.11.1. Field Environmental Monitoring

Emperor Energy will maintain a quantitative record of emissions and discharges and other environmental matters generated on location by all phases of the activity, as required under Regulation 22(6) of the OPGGS(E) Regulations.

The MODU and vessel contractors are responsible for collecting and reporting the required data to the AGR Drilling Supervisor. The collection and reporting of data is facilitated, in part, by completing a daily environmental monitoring register that AGR will provide to the contractors, which captures the commitments made in Section 5.10 and Section 8.3 of this EP. The monitoring and recording requirements for the activity are detailed in Table 8-7 and emission and discharge reporting requirements are detailed in Table 8-8. Where applicable this data will be used to determine the activity's performance against the EPOs and EPSs.

Table 8-7: Monitoring and Recording Requirements for the Activity

Activity	Monitoring	Record keeping
Training	Details of crew environmental inductions.	Induction Record Sheets.
Waste management	Quantities of waste landfilled, recycled, and discharged.	Waste Log Garbage Record Book, Spill response operations – waste transfer logs.
Fauna interactions	Fauna sightings. Any interactions between marine fauna and vessels.	DCCEEW fauna sightings report forms and records of transmittal to DCCEEW.
Incident reporting	Number and details of environmental incidents.	EHS incident reports.
Compliance reporting	Compliance with EP EPOs and EPSs.	Completed environmental inspection / audit check sheet.

Activity	Monitoring	Record keeping
Maintenance	Maintenance schedule for applicable equipment.	PMS records.
On-going Consultation	Records of consultation with stakeholders.	Transmittals to stakeholders and responses.

Table 8-8: Emissions and Discharges to be Recorded for the Activity

EMISSION OR DISCHARGE	GEOPHYSICAL VESSEL	GEOTECHNICAL VESSEL	MODU	SUPPORT VESSELS	INFORMATION RECORDED	BY WHOM AND WHEN	RECORDS AND REPORTING
Bilge water	Yes	Yes	Yes	Yes	Volume, location and vessel speed	Vessel Master / OIM, as required.	Oil Record Book
Ballast water discharges	Yes	Yes	Yes	Yes	Volume, location	Vessel Master / OIM, as required.	Ballast Water Record System
Chemical discharges to marine environment	N/A	Yes	Yes	Yes	Chemical name, type, use and volume	Geotechnical and MODU contractors, after each batch discharge or daily for ongoing.	Daily Report
Fuel use	Yes	Yes	Yes	Yes	Volume of fuel used.	Vessel Master / OIM, daily.	Daily Report
Oil in water discharged overboard from vessels >400 tonnes	Yes	Yes	Yes	Yes	Volume and concentration of oil discharged.	Vessel Master or Chief Engineer, after each batch discharge or daily for ongoing.	Oil Record Book
Sewage from vessels >400 tonnes	Yes	Yes	Yes	Yes	Volumes discharged overboard.	Vessel Master or Chief Engineer, estimates daily.	Garbage Record Book
Waste	Yes	Yes	Yes	Yes	Quantities and types of waste backloaded to shore.	Vessel Master or Chief Engineer, after each backload.	Garbage Record Book

EMISSION OR DISCHARGE	GEOPHYSICAL VESSEL	GEOTECHNICAL VESSEL	MODU	SUPPORT VESSELS	INFORMATION RECORDED	BY WHOM AND WHEN	RECORDS AND REPORTING
Cement	N/A	No	Yes	N/A	Nature of discharge, volume, and location	Cement Contractor, after each batch discharge or daily for ongoing.	DDR and/or Daily Cement Report
Drill cuttings and mud	N/A	Yes	Yes	N/A	Fluid type, fluid volume and % oil on cuttings	Drilling Contractor, after each batch discharge or daily for ongoing.	DDR and/or Daily Mud Report
Accidental release or losses overboard	Yes	Yes	Yes	Yes	Nature of the discharge material, and volume / amount	Vessel Master / OIM, as required.	Incident Report Daily Report
Dropped objects	Yes	Yes	Yes	Yes	Type, location, quantity.	Vessel Master / OIM, as required.	Incident Report Daily Report
Interference with other marine users	Yes	Yes	Yes	Yes	Nature of the incident	Vessel Masters, as required	Incident Report Daily Report
Hydrocarbon or chemical spill	Yes	Yes	Yes	Yes	Volume, chemical / oil type	Vessel Master / OIM, as required.	Incident Report Daily Report

8.11.2. Contractor Monitoring and Review

The vessel and MODU contractors will have specific contractual compliance obligations associated with implementing the EP, OPEP, and other applicable plans. Emperor Energy will monitor the contractors against these obligations both in terms of deliverables and quality.

AGR will have in place commitments registers to assist in monitoring these plans.

8.11.3. Auditing, Assurance, and Inspections

Various HSE inspections and audits are required to ensure that the activity meets all required commitments outlined in the EP and OPEP. Emperor Energy will ensure that these inspections and audits are undertaken by experienced and competent personnel to ensure environmental performance aligns with this EP, as outlined in Table 8-9.

Inspections and audits will be documented, and corrective actions will be tracked to completion.

Completed inspection and audit reports and recommended actions will be reviewed by the Emperor Energy Environmental Manager and signed off by the Emperor Energy COO.

Each contractor's internal environmental performance monitoring and auditing commitments are detailed in its HSEMS, including identification and management of non-conformance. These processes will ensure that continual monitoring and improvement occurs so that HSE performance meets the requirements of the organisation's HSE policies, as well as applicable requirements from the EP (as documented in the EP Commitments Register).

Environmental performance assurance of the activity will be undertaken by the Emperor Energy Environmental Manager to ensure that:

- There is compliance with the EPOs and EPSs in the EP and OPEP.
- There is compliance with the EP Implementation Strategy.
- Any additional, or increased, impacts or risks are identified.
- Potential non-compliances and opportunities for improvement are identified so they can be rectified.
- Environmental monitoring requirements have been met before completing the activity.

EPOs, EPSs and implementation strategy requirements will be documented and tracked in the Judith-2 Exploration Well EP Commitment Register, as part of the Emperor Energy Compliance Management System that will also be used when undertaking inspections and audits.

The findings and recommendations from inspections and audits will be documented and distributed to relevant personnel for comment. Any non-compliances or opportunities for improvement will be communicated to the MODU OIM, Vessel Masters and supervisors at the time of the inspection or audit to ensure there is adequate time to implement corrective actions. Outcomes from audits and inspections will be used to inform the EP performance report.

Any non-compliance with the EPS outlined in this EP will be internally and externally reported and subject to investigation and follow-up action.

Table 8-9: Summary of inspections and audits to be undertaken for the activity

INSPECTION/ AUDIT	APPLICABLE ACTIVITY				METHOD	WHEN	RESPONSIBILITY
	Geophysical vessel	Geotechnical Vessel	MODU	Support vessels			
Pre-activity HSE due diligence inspection	Yes	Yes	Yes	Yes	Desktop – examination of class certificates and training records	Pre-activity (and post-award)	AGR in accordance with AGR's Contractor Evaluation Procedure (AGR-LCSM-P-02). To be reviewed and approved by Emperor Energy.
EP compliance audit	Yes While in port ahead of activity	Yes While in port ahead of activity	Yes While drilling	Yes While in port ahead of or during activity	Onboard, using the EP commitments register as the audit tool	In port (vessels) and during drilling (MODU)	Emperor Energy and/or AGR, using an appropriately qualified and experienced auditor familiar with MODU operations and environmental management. To be reviewed and accepted by Emperor Energy. Forms the basis for the EP close-out report.
Ongoing informal inspections	Yes	Yes	Yes	Yes	Onboard & remote, using an EP checklist	Weekly for drilling. Daily for site surveys.	Site surveys – Site Supervisor. Drilling – Onboard HSE Advisor. To be reviewed and signed off by the Emperor Energy Environmental Manager and/or COO.

8.12. Management of Non-Conformance

Non-conformances with EPOs and EPSs can arise from incidents and associated reports, hazard observations, inspection and audit findings, and after action reviews.

The daily meeting is a pivotal tool to resolve potential non-conformances, whereby the Site Supervisor or AGR Drilling Supervisor will communicate these items to Emperor Energy onshore management. Depending on the nature and level of non-conformance, the issue may be recorded in the contractor's and/or AGR's Corrective Actions Register. For example, a low-risk observation around waste segregation identified offshore by a vessel contractor may only be recorded using the contractor's non-conformance process. A hydrocarbon or chemical spill to sea will be of greater concern (risk) and benefit in Emperor Energy following up and recording through its system. It is the responsibility of the Emperor Energy COO and Environmental Manager to consider the level of risk to determine the appropriate recording and management of the incident in line with Emperor Energy's HSEMS.

8.13. Oil Pollution Emergency Plan

Regulation 22(8) to Regulation 22(16) of the OPGGS(E) Regulations requires the implementation strategy to contain an OPEP and the provision for the OPEP to be updated. Oil spill response arrangements for responding to and monitoring an oil spill are detailed in the Judith-2 Exploration Well OPEP.

OPEP review triggers and testing arrangements and objectives appropriate to the nature and scale of Emperor Energy's activities are detailed in Section 7 of the Judith-2 Exploration Well OPEP.

9. REFERENCES

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APPENDIX A EMPEROR ENERGY HEALTH, SAFETY AND ENVIRONMENT POLICY

Emperor Energy Limited
Health, Safety and Environmental Policy Statement

As a petroleum exploration company, Emperor Energy Limited (Emperor Energy) is committed to protecting the health and safety of personnel, protection of the environment and the quality of its operations in line with international best practice and standards.

Through continuous improvement, risk assessment, rules and procedures, Health, Safety and Environment is a priority at every level of Emperor Energy. Our employees and contractors are the ambassadors of this culture.

HSE Manual

Emperor Energy maintains a Health, Safety and Environmental Management System (HSE-MS) clearly documented in an operating manual that outlines the processes that will be employed and implemented (HSE-MS) clearly project development.

This manual is also designed to meet the international best practice standards for Health, Safety and Environment. The Emperor Energy HSE-MS applies in full, without modification to all Emperor Energy owned and operated sites, offices and locations where Emperor Energy has operational control. All HSE-MS employees, contractors and visitors to Emperor Energy operated locations are required to comply with the HSE-MS.

Contractor Management

Where Emperor Energy has engaged contractors and sub-contractors to perform work on its behalf, working at their own offices or site locations: Emperor Energy requires the contractor to have their own HSE-MS that meets or exceeds these requirements.

Risk Management

Risks to Emperor Energy personnel and its contractors are managed by identifying hazards, assessing consequences and probabilities, and evaluating and implementing prevention and mitigation measures. Emperor Energy conducts risk assessments for ongoing activities, operations and for projects in order to identify and address potential hazards to personnel, public, environment and facilities.

Environmental Management

All Emperor Energy personnel are encouraged and empowered to work in a manner that promotes conservation of the environment and are included as part of the annual HSE plan.

For Emperor Energy project activities, environmental impacts are captured on the relevant project risk register where applicable and will include at a minimum the controls in place to ensure that:

- Any impact from Emperor Energy activities on the environment is minimised and includes where relevant, consideration of the sensitivity of habitat, flora and fauna at each site before starting work;
- Consideration of any materials, waste, or emissions that may affect or degrade water supply or soil and any other impacts identified;
- Observance of local rules for restricted or protected areas, any fire restrictions in place and at all times minimise or eliminate and disruption to wildlife.

Where required individual project risk assessments will take into account environmental considerations.

Continuous Improvement

Emperor Energy commits to a continual improvement program to develop and improve its Health, Safety and Environment systems, practices and procedures. This is an important part of our operating strategy as we recognise the need to verify progress and identify issues or areas that require strengthening in respect to HSE management.

Doug Jendry
Chairman

Tim Handley
MD & CEO

APPENDIX B EPBC PROTECTED MATTERS SEARCH TOOL RESULTS

Australian Government

Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.



Figure 1: Judith 2 Operational Area

Report created: 16-Feb-2026

Summary

Details

- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat

Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	43
Listed Migratory Species:	44

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	62
Whales and Other Cetaceans:	28
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	17
Key Ecological Features (Marine):	1
Biologically Important Areas:	11
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Rexea solandri (eastern Australian population) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus Tope, Flake, Oil Shark, School Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis		
Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
[Caperea marginata](#) Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
[Carcharhinus longimanus](#) Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
[Carcharias taurus](#) Grey Nurse Shark [64469]		Species or species habitat may occur within area
[Carcharodon carcharias](#) White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
[Eubalaena australis as Balaena glacialis australis](#) Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
[Isurus oxyrinchus](#) Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
[Lagenorhynchus obscurus](#) Dusky Dolphin [43]		Species or species habitat likely to occur within area
[Lamna nasus](#) Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
[Megaptera novaeangliae](#) Humpback Whale [38]		Species or species habitat known to occur within area
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat likely to occur within area
[Physeter macrocephalus](#) Sperm Whale [59]		Species or species habitat may occur within area
[Rhincodon typus](#) Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Wetlands Species		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Migration route may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
[Thalassarche salvini](#) Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
[Heraldia nocturna](#) Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
[Hippocampus abdominalis](#) Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
[Hippocampus breviceps](#) Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
[Hippocampus minotaur](#) Bullneck Seahorse [66705]		Species or species habitat may occur within area
[Histiogamphelus briggsii](#) Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
[Histiogamphelus cristatus](#) Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
[Hypselognathus rostratus](#) Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
[Kaupus costatus](#) Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
[Kimblaeus bassensis](#) Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Whales and Other Cetaceans		[Resource Information]
Current Scientific Name	Status	Type of Presence
Mammal		
[Balaenoptera acutorostrata](#) Minke Whale [33]		Species or species habitat may occur within area
[Balaenoptera bonaerensis](#) Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
[Balaenoptera borealis](#) Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Balaenoptera edeni](#) Bryde's Whale [35]		Species or species habitat may occur within area
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
[Balaenoptera physalus](#) Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Berardius arnuxii](#) Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
[Caperea marginata](#) Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
[Delphinus delphis](#) Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
[Eubalaena australis](#) Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area

Current Scientific Name	Status	Type of Presence
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed

Key Ecological Features [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Upwelling East of Eden	South-east

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence
Seabirds		
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Eubalaena australis Southern Right Whale [40]	Migration	

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

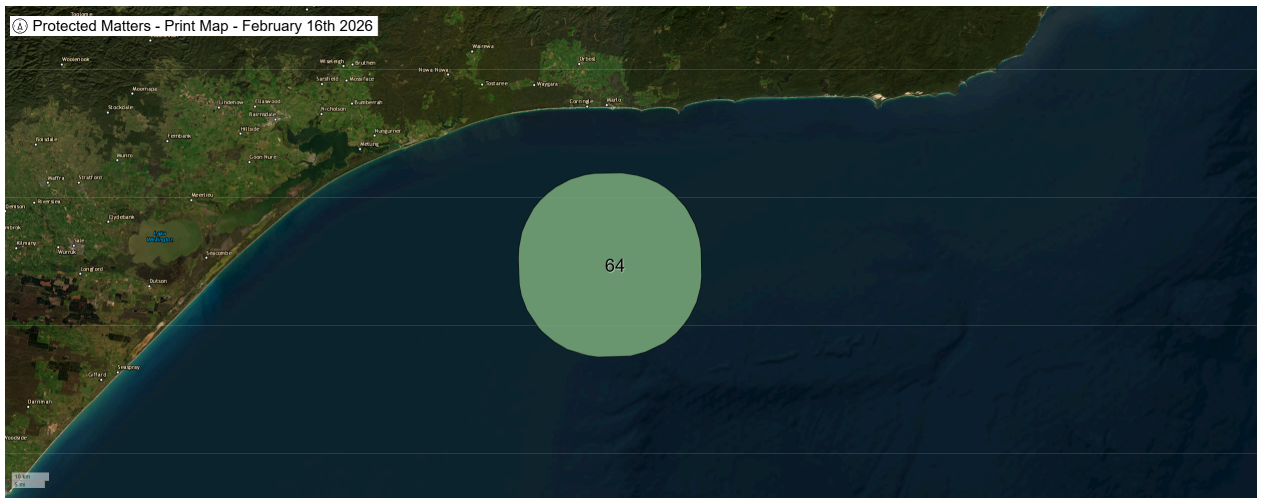


Figure 1: Judith 2 - 20 km Light EMBA

Report created: 16-Feb-2026

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Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	44
Listed Migratory Species:	45

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	63
Whales and Other Cetaceans:	28
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	29
Key Ecological Features (Marine):	1
Biologically Important Areas:	11
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus		
Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena		
Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Rexea solandri (eastern Australian population)		
Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama		
Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eubalaena australis		
Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
REPTILE		
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharodon carcharias		
White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Centrophorus harrissoni		
Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato		
Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus		
Tope, Flake, Oil Shark, School Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardenna carneipes		
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche cauta		
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma		
Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis		
Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharias taurus Grey Nurse Shark [64469]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
[Lagenorhynchus obscurus](#) Dusky Dolphin [43]		Species or species habitat likely to occur within area
[Lamna nasus](#) Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
[Megaptera novaeangliae](#) Humpback Whale [38]		Species or species habitat known to occur within area
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat likely to occur within area
[Physeter macrocephalus](#) Sperm Whale [59]		Species or species habitat may occur within area
[Rhincodon typus](#) Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Wetlands Species		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes		
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea as Puffinus griseus		
Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus		
Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
Heraldia nocturna		
Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis		
Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps		
Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur		
Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii		
Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus		
Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area
Reptile		

Scientific Name	Threatened Category	Presence Text
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Whales and Other Cetaceans		[Resource Information]
Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
[Caperea marginata](#) Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
[Delphinus delphis](#) Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
[Eubalaena australis](#) Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
[Globicephala macrorhynchus](#) Short-finned Pilot Whale [62]		Species or species habitat may occur within area
[Globicephala melas](#) Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
[Grampus griseus](#) Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
[Kogia breviceps](#) Pygmy Sperm Whale [57]		Species or species habitat may occur within area
[Kogia sima](#) Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
[Lagenorhynchus obscurus](#) Dusky Dolphin [43]		Species or species habitat likely to occur within area
[Lissodelphis peronii](#) Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
[Megaptera novaeangliae](#) Humpback Whale [38]		Species or species habitat known to occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Navigator North Offshore Wind Farm ? Early Marine Survey Investigations	2024/10093		Referral Decision
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
Not controlled action (particular manner)			
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed

Key Ecological Features [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Upwelling East of Eden	South-east

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence
Seabirds		
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Eubalaena australis Southern Right Whale [40]	Migration	

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

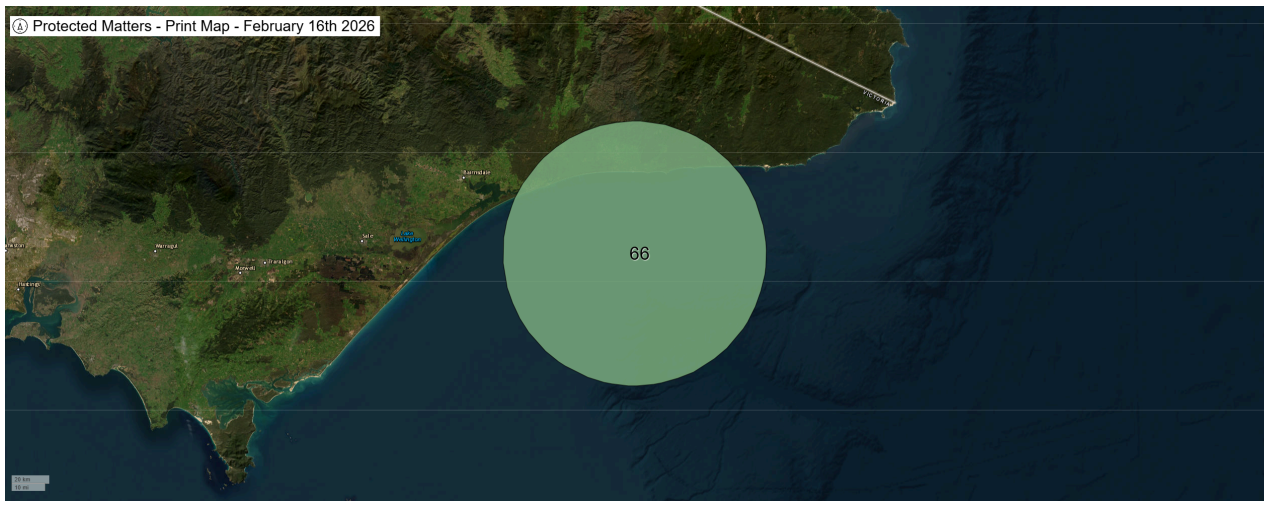


Figure 1: Judith 2 - 63 km Flaring Light EMBA

Report created: 16-Feb-2026

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Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	9
Listed Threatened Species:	111
Listed Migratory Species:	57

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	91
Whales and Other Cetaceans:	30
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	23
Regional Forest Agreements:	2
Nationally Important Wetlands:	None
EPBC Act Referrals:	63
Key Ecological Features (Marine):	2
Biologically Important Areas:	14
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity
Gippsland lakes	Within Ramsar site

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Dry rainforests of south-east New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Gippsland Red Gum (Eucalyptus tereticornis subsp. mediana) Grassy Woodland and Associated Native Grassland	Critically Endangered	Community likely to occur within area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community may occur within area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community may occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Community Name	Threatened Category	Presence Text
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Aphelocephala leucopsis		
Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area
Ardenna grisea		
Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus		
Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Callocephalon fimbriatum		
Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus lathami lathami		
South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
CRUSTACEAN		

Scientific Name	Threatened Category	Presence Text
Euastacus bidawalus		
Bidhawal Crayfish, Bidawal Crayfish, East Gippsland Spiny Crayfish [83136]	Endangered	Species or species habitat may occur within area
Euastacus diversus		
Orbost Spiny Crayfish [66782]	Endangered	Species or species habitat known to occur within area
Euastacus sp. 1 coughrani (McCormack & Fetzner)		
Coughran's Crayfish, Arte Spiny Crayfish [92902]	Endangered	Species or species habitat known to occur within area
FISH		
Galaxiella pusilla		
Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat may occur within area
Hoplostethus atlanticus		
Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena		
Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population)		
Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama		
Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
FROG		
Heleioporus australiacus flavopunctatus		
Southern Owl Frog, Southern Giant Burrowing Frog [92014]	Endangered	Species or species habitat likely to occur within area
Litoria aurea		
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Litoria watsoni		
Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Ranoidea raniformis listed as Litoria raniformis		
Southern Bell Frog, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [94668]	Vulnerable	Species or species habitat known to occur within area
Uperoleia martini		
Martin's Toadlet [1873]	Endangered	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Eubalaena australis		
Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isoodon obesulus obesulus		
Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus		
Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat may occur within area
Petauroides volans		
Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Petaurus australis australis		
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Potorous longipes		
Long-footed Potoroo [217]	Endangered	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus		
Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus		
Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae		
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
PLANT		
Acacia caerulescens		
Limestone Blue Wattle, Buchan Blue, Buchan Blue Wattle [21883]	Vulnerable	Species or species habitat known to occur within area
Acacia lanigera var. gracilipes		
[31652]	Endangered	Species or species habitat may occur within area
Amphibromus fluitans		
River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area
Astrotricha sp. Wingan Inlet (J.A.Jeanes 2268)		
Wingan Star-hair [85675]	Endangered	Species or species habitat may occur within area
Caladenia ancylosa		
Genoa Spider-orchid, Gippsland Spider Orchid [84574]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Calochilus pulchellus Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat may occur within area
Commersonia prostrata Dwarf Kerrawang [87152]	Endangered	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat likely to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area
Grevillea celata Colquhoun Grevillea, Nowa Nowa Grevillea [64907]	Vulnerable	Species or species habitat may occur within area
Olearia rugosa subsp. distalilobata [87983]	Endangered	Species or species habitat may occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat likely to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat likely to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Endangered	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area
REPTILE		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding likely to occur within area
Liopholis montana Mountain Skink [87162]	Endangered	Species or species habitat may occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
Pseudemoia rawlinsoni Glossy Grass Skink, Swampland Cool-skink, Rawlinson's Window-eyed Skink [59160]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus Tope, Flake, Oil Shark, School Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis		
Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
[Caperea marginata](#) Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
[Carcharhinus longimanus](#) Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
[Carcharias taurus](#) Grey Nurse Shark [64469]		Species or species habitat may occur within area
[Carcharodon carcharias](#) White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
[Eretmochelys imbricata](#) Hawksbill Turtle [1766]	Vulnerable	Breeding likely to occur within area
[Eubalaena australis as Balaena glacialis australis](#) Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
[Isurus oxyrinchus](#) Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
[Lagenorhynchus obscurus](#) Dusky Dolphin [43]		Species or species habitat likely to occur within area
[Lamna nasus](#) Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Megaptera novaeangliae		
Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca		
Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus		
Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus		
Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis		
Red-necked Stint [860]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Australian Postal Corporation	
Crown Allotment 13 Section 10 Township of Orbost [AGPR7265]	VIC
PC354906M [AGPR6975]	VIC

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardenna carneipes as Puffinus carneipes		
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus		
Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Bubulcus ibis as Ardea ibis		
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus		
Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
[Diomedea sanfordi](#) Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
[Gallinago megala](#) Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area overfly marine area
[Gallinago stenura](#) Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area overfly marine area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Breeding known to occur within area
[Halobaena caerulea](#) Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
[Himantopus himantopus](#) Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Roosting known to occur within area overfly marine area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area overfly marine area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri platei as Thalassarche sp. nov.		
Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri		
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta		
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma		
Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus as Thinornis rubricollis		
Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis		
Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa nebularia		
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Fish		
Heraldia nocturna		
Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis		
Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps		
Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur		
Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii		
Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus		
Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus		
Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus		
Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis		
Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding likely to occur within area

Whales and Other Cetaceans [Resource Information]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Bancroft Bay - Kalimna G.L.R.	Natural Features Reserve	VIC
Barga	Reference Area	VIC
Bemm, Goolengook, Arte and Errinundra Rivers	Heritage River	VIC
Beware Reef	Marine Sanctuary	VIC
Brodribb F.R.	Nature Conservation Reserve	VIC
Brodribb River F.F.R	Nature Conservation Reserve	VIC
Cabbage Tree Creek F.R	Nature Conservation Reserve	VIC
Cape Conran Coastal Park	Conservation Park	VIC
Croajingolong	National Park	VIC
Ewing Morass W.R	Natural Features Reserve	VIC
First and Second Islands F.R.	Nature Conservation Reserve	VIC
Flannagan Island G.L.R.	Natural Features Reserve	VIC
Fraser Island G.L.R.	Natural Features Reserve	VIC
Gippsland Lakes Coastal Park	Conservation Park	VIC
Lake Corringle W.R	Natural Features Reserve	VIC
Lake Curlip W.R.	Natural Features Reserve	VIC
Lake Tyers S.P.	State Park	VIC
Nyerimilang Park G.L.R.	Natural Features Reserve	VIC
Rigby Island G.L.R.	Natural Features Reserve	VIC
Snowy River	Heritage River	VIC

Protected Area Name	Reserve Type	State
William Hunter F.R	Nature Conservation Reserve	VIC
Wombat Creek N.C.R.	Natural Features Reserve	VIC
Wood Point F.R	Nature Conservation Reserve	VIC

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
East Gippsland	Victoria
Gippsland	Victoria

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
Gippsland Dawn Offshore Wind Project Geophysical and Geotechnical Investigations	2024/10030		Referral Decision
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Completed
Krauatungalung Walk	2024/10043		Completed
Navigator North Offshore Wind Farm ? Early Marine Survey Investigations	2024/10093		Referral Decision
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Completed
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
Acquistion of 2D seismic data in State Waters adjacent to Ninety Mile Beach-VIC/P39(V)	2004/1889	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Field Development	2007/3402	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed
Cunninghame Arm Redevelopment (Stage 3)	2002/618	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
East Gippsland Pipeline compressor station, Newmerella, VIc	2014/7390	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Gippsland Lakes Composting Toilet Program	2000/66	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed
Northright-1 Exploration Well	2001/209	Not Controlled Action	Completed
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Offshore Seismic Survey	2001/498	Not Controlled Action	Completed
Pump station upgrades and rising main construction, Lakes Entrance, Victoria	2016/7646	Not Controlled Action	Completed
Sole-2 appraisal gas well, VIC/RL3	2002/636	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
Not controlled action (particular manner)			
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey Permit Area VIC/P49	2006/2943	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey Program in Bass Strait	2008/4040	Not Controlled Action (Particular Manner)	Post-Approval
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Lakes Entrance Sand Management Program Trial Dredging	2007/3694	Not Controlled Action (Particular Manner)	Completed
Lakes Entrance Sand Management Program Trial Dredging	2007/3852	Not Controlled Action (Particular Manner)	Post-Approval
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging of Oceanic Sand	2011/5932	Not Controlled Action (Particular Manner)	Post-Approval
Non-exclusive 3-D Marine Seismic Survey, Bass Strait	2002/775	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Seismic survey, Gippsland Basin	2001/525	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Tuskfish 3D Seismic Survey, Bass Strait	2002/864	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed
Stanton 3D Marine Seismic Survey	2013/6764	Referral Decision	Completed
Upgrade of Corringle Road	2009/4825	Referral Decision	Completed

Key Ecological Features [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Big Horseshoe Canyon	South-east
Upwelling East of Eden	South-east

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Eubalaena australis Southern Right Whale [40]	Migration	
Eubalaena australis Southern Right Whale [40]	Reproduction	

Bioregional Assessments [Resource Information]

SubRegion	BioRegion	Website

SubRegion	BioRegion	Website
Gippsland	Gippsland Basin	BA website

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.



Figure 1: Judith 2 Impulsive Noise EMBA

Report created: 16-Feb-2026

Summary

Details

- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat

Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	9
Listed Threatened Species:	111
Listed Migratory Species:	57

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	91
Whales and Other Cetaceans:	30
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	23
Regional Forest Agreements:	2
Nationally Important Wetlands:	None
EPBC Act Referrals:	63
Key Ecological Features (Marine):	2
Biologically Important Areas:	14
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity
Gippsland lakes	Within Ramsar site

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Dry rainforests of south-east New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Gippsland Red Gum (Eucalyptus tereticornis subsp. mediana) Grassy Woodland and Associated Native Grassland	Critically Endangered	Community likely to occur within area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community may occur within area
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community may occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Community Name	Threatened Category	Presence Text
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Aphelocephala leucopsis		
Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area
Ardenna grisea		
Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus		
Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Callocephalon fimbriatum		
Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus lathami lathami		
South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
CRUSTACEAN		

Scientific Name	Threatened Category	Presence Text
Euastacus bidawalus		
Bidhawal Crayfish, Bidawal Crayfish, East Gippsland Spiny Crayfish [83136]	Endangered	Species or species habitat may occur within area
Euastacus diversus		
Orbost Spiny Crayfish [66782]	Endangered	Species or species habitat known to occur within area
Euastacus sp. 1 coughrani (McCormack & Fetzner)		
Coughran's Crayfish, Arte Spiny Crayfish [92902]	Endangered	Species or species habitat known to occur within area
FISH		
Galaxiella pusilla		
Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat may occur within area
Hoplostethus atlanticus		
Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Prototroctes maraena		
Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population)		
Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama		
Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
FROG		
Heleioporus australiacus flavopunctatus		
Southern Owl Frog, Southern Giant Burrowing Frog [92014]	Endangered	Species or species habitat likely to occur within area
Litoria aurea		
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Litoria watsoni		
Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Ranoidea raniformis listed as Litoria raniformis		
Southern Bell Frog, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [94668]	Vulnerable	Species or species habitat known to occur within area
Uperoleia martini		
Martin's Toadlet [1873]	Endangered	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Eubalaena australis		
Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Isoodon obesulus obesulus		
Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus		
Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat may occur within area
Petauroides volans		
Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Petaurus australis australis		
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Potorous longipes		
Long-footed Potoroo [217]	Endangered	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus		
Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus		
Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae		
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
PLANT		
Acacia caerulescens		
Limestone Blue Wattle, Buchan Blue, Buchan Blue Wattle [21883]	Vulnerable	Species or species habitat known to occur within area
Acacia lanigera var. gracilipes		
[31652]	Endangered	Species or species habitat may occur within area
Amphibromus fluitans		
River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area
Astrotricha sp. Wingan Inlet (J.A.Jeanes 2268)		
Wingan Star-hair [85675]	Endangered	Species or species habitat may occur within area
Caladenia ancylosa		
Genoa Spider-orchid, Gippsland Spider Orchid [84574]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Calochilus pulchellus Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat may occur within area
Commersonia prostrata Dwarf Kerrawang [87152]	Endangered	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat likely to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area
Grevillea celata Colquhoun Grevillea, Nowa Nowa Grevillea [64907]	Vulnerable	Species or species habitat may occur within area
Olearia rugosa subsp. distalilobata [87983]	Endangered	Species or species habitat may occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat likely to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat likely to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Endangered	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area
REPTILE		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding likely to occur within area
Liopholis montana Mountain Skink [87162]	Endangered	Species or species habitat may occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
Pseudemoia rawlinsoni Glossy Grass Skink, Swampland Cool-skink, Rawlinson's Window-eyed Skink [59160]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus Tope, Flake, Oil Shark, School Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis		
Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
[Caperea marginata](#) Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
[Carcharhinus longimanus](#) Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
[Carcharias taurus](#) Grey Nurse Shark [64469]		Species or species habitat may occur within area
[Carcharodon carcharias](#) White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
[Eretmochelys imbricata](#) Hawksbill Turtle [1766]	Vulnerable	Breeding likely to occur within area
[Eubalaena australis as Balaena glacialis australis](#) Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
[Isurus oxyrinchus](#) Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
[Lagenorhynchus obscurus](#) Dusky Dolphin [43]		Species or species habitat likely to occur within area
[Lamna nasus](#) Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Megaptera novaeangliae		
Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca		
Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus		
Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus		
Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis		
Red-necked Stint [860]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Australian Postal Corporation	
Crown Allotment 13 Section 10 Township of Orbost [AGPR7265]	VIC
PC354906M [AGPR6975]	VIC

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardenna carneipes as Puffinus carneipes		
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus		
Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area
Bubulcus ibis as Ardea ibis		
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus		
Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
[Diomedea sanfordi](#) Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
[Gallinago megala](#) Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area overfly marine area
[Gallinago stenura](#) Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area overfly marine area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Breeding known to occur within area
[Halobaena caerulea](#) Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
[Himantopus himantopus](#) Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Roosting known to occur within area overfly marine area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area overfly marine area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche bulleri platei as Thalassarche sp. nov.		
Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri		
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta		
Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma		
Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus as Thinornis rubricollis		
Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis		
Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa nebularia		
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Fish		
Heraldia nocturna		
Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis		
Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps		
Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus minotaur		
Bullneck Seahorse [66705]		Species or species habitat may occur within area
Histiogamphelus briggsii		
Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus		
Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus		
Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus		
Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis		
Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding likely to occur within area

Whales and Other Cetaceans [Resource Information]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Bancroft Bay - Kalimna G.L.R.	Natural Features Reserve	VIC
Barga	Reference Area	VIC
Bemm, Goolengook, Arte and Errinundra Rivers	Heritage River	VIC
Beware Reef	Marine Sanctuary	VIC
Brodribb F.R.	Nature Conservation Reserve	VIC
Brodribb River F.F.R	Nature Conservation Reserve	VIC
Cabbage Tree Creek F.R	Nature Conservation Reserve	VIC
Cape Conran Coastal Park	Conservation Park	VIC
Croajingolong	National Park	VIC
Ewing Morass W.R	Natural Features Reserve	VIC
First and Second Islands F.R.	Nature Conservation Reserve	VIC
Flannagan Island G.L.R.	Natural Features Reserve	VIC
Fraser Island G.L.R.	Natural Features Reserve	VIC
Gippsland Lakes Coastal Park	Conservation Park	VIC
Lake Corringle W.R	Natural Features Reserve	VIC
Lake Curlip W.R.	Natural Features Reserve	VIC
Lake Tyers S.P.	State Park	VIC
Nyerimilang Park G.L.R.	Natural Features Reserve	VIC
Rigby Island G.L.R.	Natural Features Reserve	VIC
Snowy River	Heritage River	VIC

Protected Area Name	Reserve Type	State
William Hunter F.R	Nature Conservation Reserve	VIC
Wombat Creek N.C.R.	Natural Features Reserve	VIC
Wood Point F.R	Nature Conservation Reserve	VIC

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
East Gippsland	Victoria
Gippsland	Victoria

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
Gippsland Dawn Offshore Wind Project Geophysical and Geotechnical Investigations	2024/10030		Referral Decision
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Completed
Krauatungalung Walk	2024/10043		Completed
Navigator North Offshore Wind Farm ? Early Marine Survey Investigations	2024/10093		Referral Decision
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Completed
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
Acquistion of 2D seismic data in State Waters adjacent to Ninety Mile Beach-VIC/P39(V)	2004/1889	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Field Development	2007/3402	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed
Cunninghame Arm Redevelopment (Stage 3)	2002/618	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
East Gippsland Pipeline compressor station, Newmerella, VIc	2014/7390	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Gippsland Lakes Composting Toilet Program	2000/66	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed
Northright-1 Exploration Well	2001/209	Not Controlled Action	Completed
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Offshore Seismic Survey	2001/498	Not Controlled Action	Completed
Pump station upgrades and rising main construction, Lakes Entrance, Victoria	2016/7646	Not Controlled Action	Completed
Sole-2 appraisal gas well, VIC/RL3	2002/636	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
Not controlled action (particular manner)			
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey Permit Area VIC/P49	2006/2943	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey Program in Bass Strait	2008/4040	Not Controlled Action (Particular Manner)	Post-Approval
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
Lakes Entrance Sand Management Program Trial Dredging	2007/3694	Not Controlled Action (Particular Manner)	Completed
Lakes Entrance Sand Management Program Trial Dredging	2007/3852	Not Controlled Action (Particular Manner)	Post-Approval
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging of Oceanic Sand	2011/5932	Not Controlled Action (Particular Manner)	Post-Approval
Non-exclusive 3-D Marine Seismic Survey, Bass Strait	2002/775	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Seismic survey, Gippsland Basin	2001/525	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Tuskfish 3D Seismic Survey, Bass Strait	2002/864	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed
Stanton 3D Marine Seismic Survey	2013/6764	Referral Decision	Completed
Upgrade of Corringle Road	2009/4825	Referral Decision	Completed

Key Ecological Features [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Big Horseshoe Canyon	South-east
Upwelling East of Eden	South-east

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence
Seabirds		
Ardenna tenuirostris		
Short-tailed Shearwater [82652]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Sharks		
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Eubalaena australis Southern Right Whale [40]	Migration	
Eubalaena australis Southern Right Whale [40]	Reproduction	

Bioregional Assessments [Resource Information]

SubRegion	BioRegion	Website

SubRegion	BioRegion	Website
Gippsland	Gippsland Basin	BA website

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

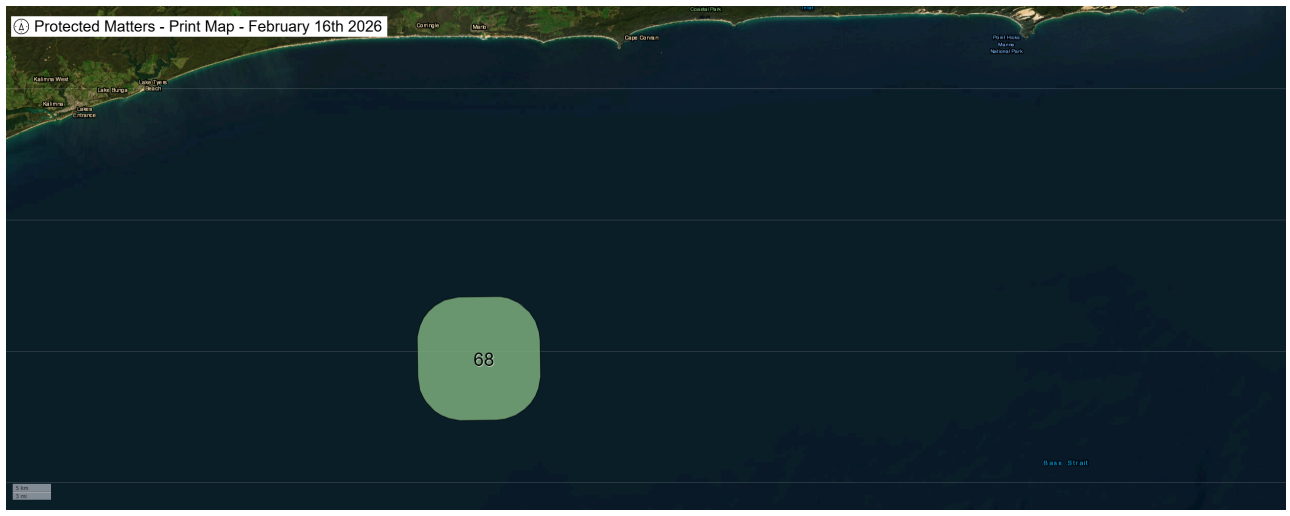


Figure 1: Judith 2 Continuous Noise EMBA

Report created: 16-Feb-2026

Summary
Details
Matters of NES
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Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	43
Listed Migratory Species:	45

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	63
Whales and Other Cetaceans:	28
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	28
Key Ecological Features (Marine):	1
Biologically Important Areas:	11
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
FISH		
Hoplostethus atlanticus Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Rexea solandri (eastern Australian population) Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
Centrophorus harrissoni Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus Tope, Flake, Oil Shark, School Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis		
Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
[Caperea marginata](#) Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
[Carcharhinus longimanus](#) Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
[Carcharias taurus](#) Grey Nurse Shark [64469]		Species or species habitat may occur within area
[Carcharodon carcharias](#) White Shark, Great White Shark [64470]	Vulnerable	Migration route known to occur within area
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
[Eubalaena australis as Balaena glacialis australis](#) Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
[Isurus oxyrinchus](#) Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
[Lagenorhynchus obscurus](#) Dusky Dolphin [43]		Species or species habitat likely to occur within area
[Lamna nasus](#) Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat may occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Migration route may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
[Thalassarche salvini](#) Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Fish		
[Heraldia nocturna](#) Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
[Hippocampus abdominalis](#) Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
[Hippocampus breviceps](#) Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
[Hippocampus minotaur](#) Bullneck Seahorse [66705]		Species or species habitat may occur within area
[Histiogamphelus briggsii](#) Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
[Histiogamphelus cristatus](#) Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
[Hypselognathus rostratus](#) Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
[Kaupus costatus](#) Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
[Kimblaeus bassensis](#) Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Whales and Other Cetaceans		[Resource Information]
Current Scientific Name	Status	Type of Presence
Mammal		
[Balaenoptera acutorostrata](#) Minke Whale [33]		Species or species habitat may occur within area
[Balaenoptera bonaerensis](#) Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
[Balaenoptera borealis](#) Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Balaenoptera edeni](#) Bryde's Whale [35]		Species or species habitat may occur within area
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
[Balaenoptera physalus](#) Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Berardius arnuxii](#) Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
[Caperea marginata](#) Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
[Delphinus delphis](#) Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
[Eubalaena australis](#) Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area

Current Scientific Name	Status	Type of Presence
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Navigator North Offshore Wind Farm ? Early Marine Survey Investigations	2024/10093		Referral Decision
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
Not controlled action (particular manner)			
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed

Key Ecological Features [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Upwelling East of Eden	South-east

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence
Seabirds		
Diomedea exulans (sensu lato)		
Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis		
Antipodean Albatross [82269]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Eubalaena australis Southern Right Whale [40]	Migration	

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

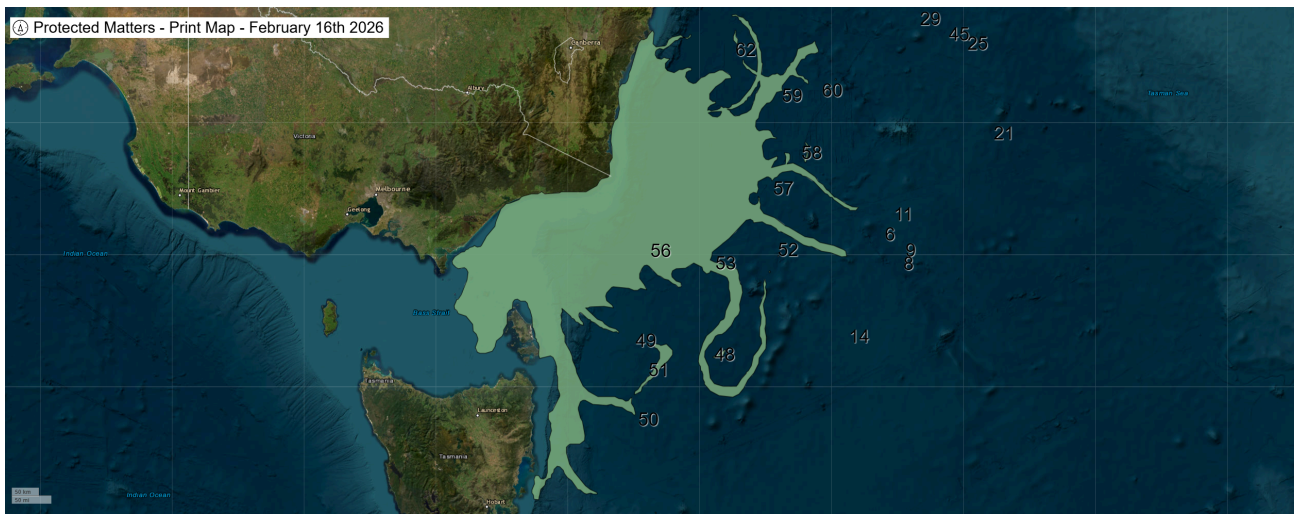


Figure 1: Judith 2 Marine Diesel Oil EMBA

Report created: 16-Feb-2026

[Summary](#)

[Details](#)

- [Matters of NES](#)
- [Other Matters Protected by the EPBC Act](#)
- [Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	4
Listed Threatened Ecological Communities:	17
Listed Threatened Species:	171
Listed Migratory Species:	87

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	25
Commonwealth Heritage Places:	11
Listed Marine Species:	137
Whales and Other Cetaceans:	36
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	2
Australian Marine Parks:	13
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	80
Regional Forest Agreements:	5
Nationally Important Wetlands:	None
EPBC Act Referrals:	114
Key Ecological Features (Marine):	5
Biologically Important Areas:	47
Bioregional Assessments:	2
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity
Corner inlet	Within 10km of Ramsar site
East coast cape barren island lagoons	Within Ramsar site
Gippsland lakes	Within Ramsar site
Logan lagoon	Within Ramsar site

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Araluen Scarp Grassy Forest	Endangered	Community may occur within area
Brogo Vine Forest of the South East Corner Bioregion	Endangered	Community likely to occur within area
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area

Community Name	Threatened Category	Presence Text
Dry rainforests of south-east New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community likely to occur within area
Gippsland Red Gum (Eucalyptus tereticornis subsp. mediana) Grassy Woodland and Associated Native Grassland	Critically Endangered	Community likely to occur within area
Illawarra and south coast lowland forest and woodland ecological community	Critically Endangered	Community likely to occur within area
Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Lowland Grassy Woodland in the South East Corner Bioregion	Critically Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community may occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pardalotus quadragintus Forty-spotted Pardalote [418]	Endangered	Species or species habitat likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Species or species habitat known to occur within area
Pterodroma heraldica Herald Petrel [66973]	Critically Endangered	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Breeding known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thinornis cucullatus cucullatus		
Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tyto novaehollandiae castanops (Tasmanian population)		
Masked Owl (Tasmanian) [67051]	Vulnerable	Species or species habitat known to occur within area
Xenus cinereus		
Terek Sandpiper [59300]	Vulnerable	Species or species habitat known to occur within area
CRUSTACEAN		
Engaeus martigener		
Furneaux Burrowing Crayfish [67220]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Euastacus bidawalus		
Bidhawal Crayfish, Bidawal Crayfish, East Gippsland Spiny Crayfish [83136]	Endangered	Species or species habitat known to occur within area
Euastacus diversus		
Orbost Spiny Crayfish [66782]	Endangered	Species or species habitat may occur within area
FISH		
Brachiopsilus ziebelli		
Ziebell's Handfish, Waterfall Bay Handfish [83757]	Vulnerable	Species or species habitat may occur within area
Epinephelus daemelii		
Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Galaxiella pusilla		
Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat may occur within area
Hippocampus whitei		
White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area
Hoplostethus atlanticus		
Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Mordacia praecox		
Non-parasitic Lamprey, Precocious Lamprey [81530]	Endangered	Species or species habitat likely to occur within area
Prototroctes maraena		
Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area
Rexea solandri (eastern Australian population)		
Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama		
Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thymichthys politus		
Red Handfish [83756]	Critically Endangered	Species or species habitat may occur within area
FROG		
Heleioporus australiacus flavopunctatus		
Southern Owl Frog, Southern Giant Burrowing Frog [92014]	Endangered	Species or species habitat known to occur within area
Litoria aurea		
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Litoria watsoni		
Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat known to occur within area
Mixophyes balbus		
Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area
Ranoidea raniformis listed as Litoria raniformis		
Southern Bell Frog, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [94668]	Vulnerable	Species or species habitat known to occur within area
Uperoleia martini		
Martin's Toadlet [1873]	Endangered	Species or species habitat known to occur within area
INSECT		
Antipodia chaostola leucophaea		
Tasmanian Chaostola Skipper, Heath-sand Skipper [77672]	Endangered	Species or species habitat may occur within area
MAMMAL		
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Dasyurus viverrinus Eastern Quoll, Luaner [333]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area
Potorous longipes Long-footed Potoroo [217]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Potorous tridactylus trisulcatus		
Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area
Pseudomys fumeus		
Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
Pseudomys novaehollandiae		
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
OTHER		
Dendronephthya australis		
Cauliflower Soft Coral [90325]	Endangered	Species or species habitat known to occur within area
PLANT		
Acacia caerulescens		
Limestone Blue Wattle, Buchan Blue, Buchan Blue Wattle [21883]	Vulnerable	Species or species habitat known to occur within area
Acacia constablei		
Narrabarba Wattle [10798]	Critically Endangered	Species or species habitat known to occur within area
Acacia georgensis		
Bega Wattle [9848]	Vulnerable	Species or species habitat known to occur within area
Acacia lanigera var. gracilipes		
[31652]	Endangered	Species or species habitat may occur within area
Amphibromus fluitans		
River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area
Astrotricha crassifolia		
Thick-leaf Star-hair [10352]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Astrotricha sp. Howe Range (D.E.Albrecht 1054)		
Long-leaf Star-hair [85676]	Critically Endangered	Species or species habitat known to occur within area
Astrotricha sp. Wingan Inlet (J.A.Jeanes 2268)		
Wingan Star-hair [85675]	Endangered	Species or species habitat known to occur within area
Banksia vincentia		
[88276]	Critically Endangered	Species or species habitat likely to occur within area
Caladenia ancylosa		
Genoa Spider-orchid, Gippsland Spider Orchid [84574]	Critically Endangered	Species or species habitat likely to occur within area
Caladenia caudata		
Tailed Spider-orchid [17067]	Vulnerable	Species or species habitat may occur within area
Caladenia tessellata		
Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Calochilus pulchellus		
Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat likely to occur within area
Commersonia prostrata		
Dwarf Kerrawang [87152]	Endangered	Species or species habitat known to occur within area
Conospermum hookeri		
Variable Smoke-bush [68161]	Vulnerable	Species or species habitat likely to occur within area
Correa baeuerlenii		
Chef's Cap [17007]	Vulnerable	Species or species habitat known to occur within area
Correa lawrenceana var. genoensis		
Genoa River Correa [66626]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Corunastylis vernalis listed as Genoplesium vernale		
East Lynne Midge-orchid [78699]	Vulnerable	Species or species habitat known to occur within area
Cryptostylis hunteriana		
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area
Cynanchum elegans		
White-flowered Wax Plant [12533]	Endangered	Species or species habitat may occur within area
Deyeuxia ramosa		
Climbing Bent-grass [87970]	Critically Endangered	Species or species habitat known to occur within area
Dianella amoena		
Matted Flax-lily [64886]	Endangered	Species or species habitat likely to occur within area
Dodonaea procumbens		
Trailing Hop-bush [12149]	Vulnerable	Species or species habitat likely to occur within area
Epacris barbata		
Bearded Heath, Freycinet Heath [17625]	Endangered	Species or species habitat likely to occur within area
Eucalyptus stenostoma		
Jillaga Ash [3976]	Endangered	Species or species habitat may occur within area
Genoplesium baueri		
Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat known to occur within area
Glycine latrobeana		
Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat likely to occur within area
Haloragis exalata subsp. exalata		
Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat likely to occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat known to occur within area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area
Pomaderris cotoneaster Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat may occur within area
Pomaderris parrisiae Parris' Pomaderris [22119]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum affine Jervis Bay Leek Orchid [2210]	Endangered	Species or species habitat known to occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat may occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prostanthera densa Villous Mintbush [12233]	Vulnerable	Species or species habitat known to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat may occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area
Spyridium cinereum Tiny Spyridium [13564]	Endangered	Species or species habitat known to occur within area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat likely to occur within area
Thelymitra jonesii Sky-blue Sun-orchid [76352]	Endangered	Species or species habitat likely to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Endangered	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area
Triplarina nowraensis Nowra Heath-myrtle [64544]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Westringia davidii [19079]	Vulnerable	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area
Zieria tuberculata Warty Zieria [56736]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Hoplocephalus bungaroides Broad-headed Snake [1182]	Endangered	Species or species habitat likely to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Pseudemoia rawlinsoni		
Glossy Grass Skink, Swampland Cool-skink, Rawlinson's Window-eyed Skink [59160]	Vulnerable	Species or species habitat known to occur within area
SHARK		
Carcharias taurus (east coast population)		
Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Congregation or aggregation known to occur within area
Carcharodon carcharias		
White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Centrophorus harrissoni		
Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato		
Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus		
Tope, Flake, Oil Shark, School Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sphyrna lewini		
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat may occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus		
Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area
Phaethon rubricauda Red-tailed Tropicbird [994]		Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis		
Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area
Carcharias taurus Grey Nurse Shark [64469]		Congregation or aggregation known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pluvialis squatarola Grey Plover [865]	Vulnerable	Species or species habitat known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Australian Financial Security Authority	
Lot 7 DP249799 [AGPR5836]	NSW
Australian Postal Corporation	
Lot 1 DP776577 [AGPR7392]	NSW
PC354906M [AGPR6975]	VIC
Department of Climate Change, Energy, the Environment and Water	
Beecroft Peninsula [CHL_105539]	NSW

Commonwealth Land Name	State
Booderee Botanic Gardens (Commonwealth) [CAPAD_CWTH_02]	JBT
Booderee National Park (Commonwealth) [CAPAD_CWTH_03]	JBT
Cape St George Lighthouse Ruins & Curtilage [CHL_105312]	ACT
Christians Minde Settlement [CHL_105314]	ACT
Gabo Island Lighthouse [CHL_105379]	VIC
Jervis Bay Botanic Gardens [CHL_105400]	ACT
Jervis Bay Territory [CHL_105394]	ACT
Montague Island Lighthouse [CHL_105601]	NSW
Point Perpendicular Lightstation [CHL_105364]	NSW
Royal Australian Naval College [CHL_105380]	ACT
Department of Defence	
Bass Pyramid Weapon Range - Bass Strait [DD_0981]	VIC
Beecroft Rapier Range [AGPR706]	NSW
Beecroft Weapons Range [DD_0027]	NSW
Bherwerre Ridge Communications Facility [DD_0019]	ACT
HMAS Albatross [AGPR778]	NSW
HMAS Albatross [AGPR779]	NSW
HMAS Creswell [DD_0020]	ACT
Jervis Bay Airfield (JBAF) [DD_0021]	ACT
Lot 52 DP914687 [AGPR6461]	NSW
Point Perpendicular Lighthouse [DD_1521]	NSW
Department of Finance	
Jervis Bay Court and Police Station [AGPR007676]	NSW

Commonwealth Heritage Places		[Resource Information]
Name	State	Status
Historic		
Cape St George Lighthouse Ruins & Curtilage	ACT	Listed place
Christians Minde Settlement	ACT	Listed place
Gabo Island Lighthouse	VIC	Listed place

Name	State	Status
Jervis Bay Botanic Gardens	ACT	Listed place
Montague Island Lighthouse	NSW	Listed place
Point Perpendicular Lightstation	NSW	Listed place
Royal Australian Naval College	ACT	Listed place
Indigenous		
Crocodile Head Area	NSW	Within listed place
Currarong Rockshelters Area	NSW	Within listed place
Jervis Bay Territory	ACT	Listed place
Natural		
Beecroft Peninsula	NSW	Listed place

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardenna pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Ardenna tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area overfly marine area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Species or species habitat known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Foraging, feeding or related behaviour known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat may occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area overfly marine area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area
Phaethon rubricauda Red-tailed Tropicbird [994]		Species or species habitat known to occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Breeding likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Breeding known to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii		
Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis		
Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis		
Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes		
Grey-tailed Tattler [851]		Species or species habitat known to occur within area
Tringa glareola		
Wood Sandpiper [829]		Species or species habitat known to occur within area overfly marine area
Tringa nebularia		
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
[Tringa stagnatilis](#) Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area
[Xenus cinereus](#) Terek Sandpiper [59300]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Fish		
[Acentronura tentaculata](#) Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
[Cosmocampus howensis](#) Lord Howe Pipefish [66208]		Species or species habitat may occur within area
[Heraldia nocturna](#) Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
[Hippocampus abdominalis](#) Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
[Hippocampus breviceps](#) Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
[Hippocampus minotaur](#) Bullneck Seahorse [66705]		Species or species habitat may occur within area
[Hippocampus whitei](#) White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area
[Histiogamphelus briggsii](#) Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
[Histiogamphelus cristatus](#) Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Reptile		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Natator depressus		
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Whales and Other Cetaceans [Resource Information]

Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata		
Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis		
Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii		
Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata		
Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis		
Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
[Eubalaena australis](#) Southern Right Whale [40]	Endangered	Breeding known to occur within area
[Feresa attenuata](#) Pygmy Killer Whale [61]		Species or species habitat may occur within area
[Globicephala macrorhynchus](#) Short-finned Pilot Whale [62]		Species or species habitat may occur within area
[Globicephala melas](#) Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
[Grampus griseus](#) Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
[Hyperoodon planifrons](#) Southern Bottlenose Whale [71]		Species or species habitat may occur within area
[Kogia breviceps](#) Pygmy Sperm Whale [57]		Species or species habitat may occur within area
[Kogia sima](#) Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
[Lagenorhynchus obscurus](#) Dusky Dolphin [43]		Species or species habitat likely to occur within area
[Lissodelphis peronii](#) Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
[Megaptera novaeangliae](#) Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon ginkgodens Gingko-toothed Beaked Whale, Gingko-toothed Whale, Gingko Beaked Whale [59564]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Peponocephala electra Melon-headed Whale [47]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Steno bredanensis Rough-toothed Dolphin [30]		Species or species habitat may occur within area
Tasmacetus shepherdi Shepherd's Beaked Whale, Tasman Beaked Whale [55]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Commonwealth Reserves Terrestrial [Resource Information]

Name	State	Type
Booderee	JBT	National Park (Commonwealth)
Booderee	JBT	Botanic Gardens (Commonwealth)

Australian Marine Parks [Resource Information]

Park Name	Zone & IUCN Categories
Flinders	Habitat Protection Zone (IUCN IV)
Jervis	Habitat Protection Zone (IUCN IV)
Beagle	Multiple Use Zone (IUCN VI)
East Gippsland	Multiple Use Zone (IUCN VI)
Flinders	Multiple Use Zone (IUCN VI)
Freycinet	Multiple Use Zone (IUCN VI)
Beagle	National Park Zone (IUCN II)
Flinders	National Park Zone (IUCN II)

Park Name	Zone & IUCN Categories
Flinders	National Park Zone (IUCN II)
Flinders	National Park Zone (IUCN II)
Freycinet	National Park Zone (IUCN II)
Freycinet	Recreational Use Zone (IUCN IV)
Jervis	Special Purpose Zone (Trawl) (IUCN VI)

Extra Information

State and Territory Reserves

[Resource Information]

Protected Area Name	Reserve Type	State
Baawang	Reference Area	VIC
Bancroft Bay - Kalimna G.L.R.	Natural Features Reserve	VIC
Barunguba Montague Island	Nature Reserve	NSW
Bass Pyramid	Nature Reserve	TAS
Batemans	Marine Park	NSW
Bemm, Goolengook, Arte and Errinundra Rivers	Heritage River	VIC
Benedore River	Reference Area	VIC
Beowa	National Park	NSW
Beware Reef	Marine Sanctuary	VIC
Biamanga	National Park	NSW
Blond Bay W.R.	Natural Features Reserve	VIC
Blyth Point	Conservation Area	TAS
Bournda	National Park	NSW
Brodribb River F.F.R	Nature Conservation Reserve	VIC
Brush Island	Nature Reserve	NSW
Cabbage Tree Creek F.R	Nature Conservation Reserve	VIC

Protected Area Name	Reserve Type	State
Cape Conran Coastal Park	Conservation Park	VIC
Cape Howe	Wilderness Zone	VIC
Cape Howe	Marine National Park	VIC
Cat Island	Conservation Area	TAS
Conjola	National Park	NSW
Craggy Island	Conservation Area	TAS
Croajingolong	National Park	VIC
Double Creek	Natural Catchment Area	VIC
East Gippsland Coastal streams	Natural Catchment Area	VIC
Eurobodalla	National Park	NSW
Ewing Morass W.R	Natural Features Reserve	VIC
First and Second Islands F.R.	Nature Conservation Reserve	VIC
Flannagan Island G.L.R.	Natural Features Reserve	VIC
Fraser Island G.L.R.	Natural Features Reserve	VIC
Freycinet	National Park	TAS
Gippsland Lakes Coastal Park	Conservation Park	VIC
Gull Island	Conservation Area	TAS
Hogan Group	Conservation Area	TAS
Jacksons Cove	Conservation Area	TAS
Jervis Bay	National Park	NSW
Jervis Bay	Marine Park	NSW
Kent Group	National Park	TAS
Killiecrankie	Nature Recreation Area	TAS
Lake Corringle W.R	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Lake Curlip W.R.	Natural Features Reserve	VIC
Lake Tyers S.P.	State Park	VIC
Little Island	Conservation Area	TAS
Logan Lagoon	Conservation Area	TAS
Low Point	Conservation Area	TAS
Mallacoota B.R.	Natural Features Reserve	VIC
Meroo	National Park	NSW
Mimosa Rocks	National Park	NSW
Mount Tanner	Nature Recreation Area	TAS
Mumbulla	Flora Reserve	NSW
Murrah	Flora Reserve	NSW
Murramarang	National Park	NSW
Murramarang	Aboriginal Area	NSW
Nadgee	Nature Reserve	NSW
Narrawallee Creek	Nature Reserve	NSW
North East Islet	Nature Reserve	TAS
Nyerimilang Park G.L.R.	Natural Features Reserve	VIC
Palana Beach	Nature Recreation Area	TAS
Pasco Group	Conservation Area	TAS
Patriarchs	Conservation Area	TAS
Point Hicks	Marine National Park	VIC
Prime Seal Island	Conservation Area	TAS
Rame Head	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Raymond Island G.L.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Rigby Island G.L.R.	Natural Features Reserve	VIC
Sandpatch	Wilderness Zone	VIC
Seal Creek	Reference Area	VIC
Seal Islands W.R.	Nature Conservation Reserve	VIC
Sellars Lagoon	Game Reserve	TAS
Sentinel Island	Conservation Area	TAS
Sister Islands	Conservation Area	TAS
Snowy River	Heritage River	VIC
Steel Bay - Newland Backwater G.L.R.	Natural Features Reserve	VIC
Storehouse Island	Conservation Area	TAS
Sugarloaf Rock	Conservation Area	TAS
Tanja	Flora Reserve	NSW
The Lakes	National Park	VIC
Vansittart Island	Conservation Area	TAS
William Hunter F.R	Nature Conservation Reserve	VIC
Wright Rock	Nature Reserve	TAS

Regional Forest Agreements

[Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
East Gippsland	Victoria
Eden	New South Wales
Gippsland	Victoria
Southern NSW	New South Wales
Tasmanian	Tasmania

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Aurora Green Offshore Wind Farm Preliminary Surveys	2024/09968		Completed
Blue Mackerel North Offshore Wind Farm Marine Surveys	2024/09934		Completed
Blue Marlin Offshore Wind Energy Project	2023/09532		Completed
Eurobodalla Regional Hospital	2023/09506		Completed
Gippsland Dawn Offshore Wind Project Geophysical and Geotechnical Investigations	2024/10030		Referral Decision
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Completed
Gippsland Regional Port Project	2020/8667		Completed
Gippsland Skies Offshore Wind Project marine surveys (investigations)	2024/09991		Referral Decision
Golf Course Extension	2001/215		Completed
Greater Gippsland Offshore Wind Project	2022/09379		Assessment
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed
Krauatungalung Walk	2024/10043		Completed
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Mirador Residential Development Stages 8 & 9 and 13	2023/09685		Assessment
Navigator North Offshore Wind Farm ? Early Marine Survey Investigations	2024/10093		Referral Decision
Preliminary Site Investigations for Great Eastern Offshore Wind Project	2024/09890		Referral Decision
Residential Development, Lot 172 DP 755923 and Lot 823 DP 247285, Manyana, NSW	2020/8704		Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
SMAP telecommunications submarine cable installation	2024/09989		Completed
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Completed
supersonic missile launch facility	2000/120		Completed
Controlled action			
Gippsland Lakes Mosquito Control Aerial /Hovercraft Spraying	2001/491	Controlled Action	Completed
North Manyana Subdivision, NSW	2021/8948	Controlled Action	Further Information Request
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
55m lattice tower & infrastructure	2003/1159	Not Controlled Action	Completed
Acquistion of 2D seismic data in State Waters adjacent to Ninety Mile Beach-VIC/P39(V)	2004/1889	Not Controlled Action	Completed
Angas and Galloway Exploration Wells VIC/P39(v)	2005/2330	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Field Development	2007/3402	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Beardie-1 Field wildcat oil well	2001/505	Not Controlled Action	Completed
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Caswell Street - Moruya East	2020/8781	Not Controlled Action	Completed
Clearance of native vegetation to create fire breaks	2004/1534	Not Controlled Action	Completed
Construction of an ocean access boat ramp at Bastion Point	2004/1407	Not Controlled Action	Completed
Cunninghame Arm Redevelopment (Stage 3)	2002/618	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
Dredging of Tuross Lake channel and depositon of spoil in lake	2004/1554	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Gippsland Lakes Composting Toilet Program	2000/66	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed
Milton/Ulladulla Sewerage Scheme	2001/251	Not Controlled Action	Completed
Northright-1 Exploration Well	2001/209	Not Controlled Action	Completed
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Offshore Seismic Survey	2001/498	Not Controlled Action	Completed
Pump station upgrades and rising main construction, Lakes Entrance, Victoria	2016/7646	Not Controlled Action	Completed
Ship to ship crude oil lightering	2008/4279	Not Controlled Action	Completed
Ship to Ship Crude Oil Lightering	2001/271	Not Controlled Action	Completed
Sole-2 appraisal gas well, VIC/RL3	2002/636	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
wastewater collection systems and pumping stations	2001/511	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
Wreck Bay Housing Development	2001/299	Not Controlled Action	Completed
Not controlled action (particular manner)			
2D Seismic Aquisition Survey	2008/4041	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/4066	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Seismic Survey	2008/4131	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey Permit Area VIC/P49	2006/2943	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey Program in Bass Strait	2008/4040	Not Controlled Action (Particular Manner)	Post-Approval
3D Seismic Survey	2008/4528	Not Controlled Action (Particular Manner)	Post-Approval
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Bass Basin 2D and 3D seismic surveys (T/38P & T/37P)	2007/3650	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval
Dalrymple 3D Seismic Survey	2010/5680	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf extension, NSW	2015/7582	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf Extension, NSW	2016/7828	Not Controlled Action (Particular Manner)	Completed
Gas Pipeline	2000/20	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Gippsland 2D Marine Seismic Survey - VIC/P-63, VIC/P-64 and T/46P	2009/5241	Not Controlled Action (Particular Manner)	Post-Approval
Golden Beach gas field development	2003/1031	Not Controlled Action (Particular Manner)	Post-Approval
Hawaiki Fibre-Optic Submarine Cable installation	2016/7765	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
International fibre optic submarine cable installation, between Sydney and Honiara, Solomon Islands	2015/7502	Not Controlled Action (Particular Manner)	Post-Approval
Lakes Entrance Sand Management Program Trial Dredging	2007/3694	Not Controlled Action (Particular Manner)	Completed
Lakes Entrance Sand Management Program Trial Dredging	2007/3852	Not Controlled Action (Particular Manner)	Post-Approval
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging of Oceanic Sand	2011/5932	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Non-exclusive 3-D Marine Seismic Survey, Bass Strait	2002/775	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Pelican 3D Marine Seismic Survey, Gippsland Basin, Vic	2017/8097	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval
Seismic survey, Gippsland Basin	2001/525	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Tuskfish 3D Seismic Survey, Bass Strait	2002/864	Not Controlled Action (Particular Manner)	Post-Approval
Waterfront Facility at HMAS Creswell	2002/658	Not Controlled Action (Particular Manner)	Post-Approval
West Seahorse Oil Development Project, Commonwealth waters offshore Victoria	2013/6973	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
Beardie-1 Field wildcat oil well	2001/469	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Beecroft Weapons Range Visitors Centre	2004/1322	Referral Decision	Completed
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed
Darymple 3D Seismic Survey, Petroleum Exploration Permit T/41P	2010/5322	Referral Decision	Completed
Enlargement of existing farm dam to irrigate a vineyard	2004/1853	Referral Decision	Completed
Holloman 2010 Vic/P60 3D Seismic Acquisition Survey Program	2009/5251	Referral Decision	Completed
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed
Stanton 3D Marine Seismic Survey	2013/6764	Referral Decision	Completed
Upgrade of Corringle Road	2009/4825	Referral Decision	Completed

Key Ecological Features [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Big Horseshoe Canyon	South-east
Canyons on the eastern continental slope	Temperate east
Seamounts South and east of Tasmania	South-east
Shelf rocky reefs	Temperate east
Upwelling East of Eden	South-east

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence
Dolphins		
Tursiops aduncus		
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur

Scientific Name	Behaviour	Presence
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Known to occur
Seabirds		
Ardenna carneipes Flesh-footed Shearwater [82404]	Foraging	Known to occur
Ardenna grisea Sooty Shearwater [82651]	Breeding	Known to occur
Ardenna grisea Sooty Shearwater [82651]	Foraging	Likely to occur
Ardenna grisea Sooty Shearwater [82651]	Foraging	Known to occur
Ardenna pacifica Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Likely to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Likely to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur

Scientific Name	Behaviour	Presence
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Macronectes giganteus Southern Giant Petrel [1060]	Foraging	Known to occur
Macronectes halli Northern Giant Petrel [1061]	Foraging	Known to occur
Oceanites oceanites Wilsons Storm Petrel [1034]	Migration	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Breeding	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Procellaria parkinsoni Black Petrel [1048]	Foraging	Likely to occur
Pterodroma macroptera Great-winged Petrel [1035]	Foraging	Likely to occur
Pterodroma mollis Soft-plumaged Petrel [1036]	Foraging	Known to occur
Sterna striata White-fronted Tern [799]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche cauta steadi White-capped Albatross [82344]	Foraging	Known to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Likely to occur
Thalasseus bergii Crested Tern [83000]	Breeding	Known to occur
Thalasseus bergii Crested Tern [83000]	Foraging	Likely to occur
Sharks		
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur
Carcharias taurus Grey Nurse Shark [64469]	Reproduction	Known to occur
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Eubalaena australis Southern Right Whale [40]	Migration	

Scientific Name	Behaviour	Presence
Eubalaena australis Southern Right Whale [40]	Reproduction	
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	Known to occur

Bioregional Assessments [Resource Information]

SubRegion	BioRegion	Website
Sydney	Sydney Basin	BA website
Gippsland	Gippsland Basin	BA website

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

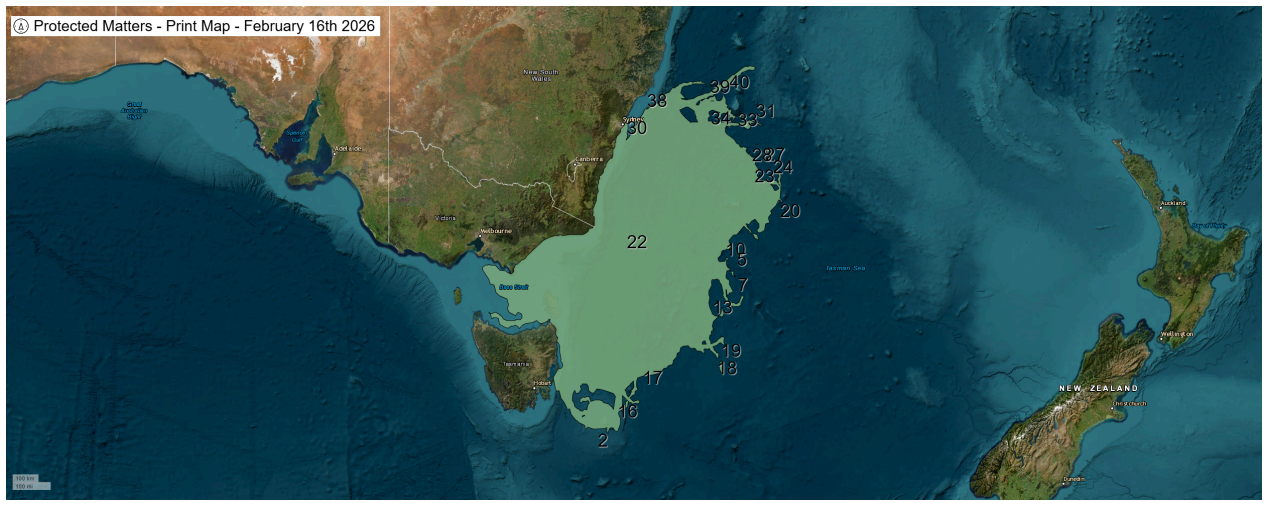


Figure 1: Judith 2 Loss of Well Control EMBA

Report created: 16-Feb-2026

Summary

Details

- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat

Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	3
National Heritage Places:	14
Wetlands of International Importance (Ramsar	8
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	6
Listed Threatened Ecological Communities:	30
Listed Threatened Species:	240
Listed Migratory Species:	93

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	286
Commonwealth Heritage Places:	76
Listed Marine Species:	149
Whales and Other Cetaceans:	39
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	2
Australian Marine Parks:	17
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	267
Regional Forest Agreements:	5
Nationally Important Wetlands:	None
EPBC Act Referrals:	292
Key Ecological Features (Marine):	7
Biologically Important Areas:	51
Bioregional Assessments:	2
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties		[Resource Information]
Name	State	Legal Status
Australian Convict Sites (Darlington Probation Station)	TAS	Declared property
Australian Convict Sites (Hyde Park Barracks)	NSW	Declared property
Sydney Opera House	NSW	Declared property

National Heritage Places		[Resource Information]
Name	State	Legal Status
Historic		
Bondi Beach	NSW	Listed place
Bondi Surf Pavilion	NSW	Within listed place
Centennial Park	NSW	Listed place
First Government House Site	NSW	Listed place
Governors' Domain and Civic Precinct	NSW	Listed place
Hyde Park Barracks	NSW	Listed place
Kamay Botany Bay: botanical collection sites	NSW	Listed place
Kurnell Peninsula Headland	NSW	Listed place
North Head - Sydney	NSW	Listed place
Sydney Harbour Bridge	NSW	Listed place
Sydney Opera House	NSW	Listed place
Darlington Probation Station	TAS	Listed place
Indigenous		
Cyprus Hellene Club - Australian Hall	NSW	Listed place
Natural		
Royal National Park and Garawarra State Conservation Area	NSW	Listed place

Wetlands of International Importance (Ramsar Wetlands)	[Resource Information]
Ramsar Site Name	Proximity
Corner inlet	Within Ramsar site

Ramsar Site Name	Proximity
East coast cape barren island lagoons	Within Ramsar site
Flood plain lower ringarooma river	Within 10km of Ramsar site
Gippsland lakes	Within Ramsar site
Jocks lagoon	Within Ramsar site
Little waterhouse lake	Within 10km of Ramsar site
Logan lagoon	Within Ramsar site
Towra point nature reserve	Within Ramsar site

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community may occur within area
Araluen Scarp Grassy Forest	Endangered	Community may occur within area
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area

Community Name	Threatened Category	Presence Text
Brogo Vine Forest of the South East Corner Bioregion	Endangered	Community likely to occur within area
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Community may occur within area
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area
Coastal Upland Swamps in the Sydney Basin Bioregion	Endangered	Community likely to occur within area
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community may occur within area
Dry rainforests of south-east New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Eastern Suburbs Banksia Scrub of the Sydney Region	Critically Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community likely to occur within area
Gippsland Red Gum (Eucalyptus tereticornis subsp. mediana) Grassy Woodland and Associated Native Grassland	Critically Endangered	Community likely to occur within area
Illawarra and south coast lowland forest and woodland ecological community	Critically Endangered	Community likely to occur within area
Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Lowland Grassy Woodland in the South East Corner Bioregion	Critically Endangered	Community likely to occur within area
Lowland Native Grasslands of Tasmania	Critically Endangered	Community likely to occur within area
Natural Damp Grassland of the Victorian Coastal Plains	Critically Endangered	Community likely to occur within area
Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion	Endangered	Community likely to occur within area

Community Name	Threatened Category	Presence Text
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area
Robertson Rainforest in the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community likely to occur within area
Turpentine-Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	Endangered	Community may occur within area
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Aphelocephala leucopsis		
Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area
Aquila audax fleayi		
Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area

Scientific Name	Threatened Category	Presence Text
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Breeding known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pardalotus quadragintus Forty-spotted Pardalote [418]	Endangered	Foraging, feeding or related behaviour known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Pterodroma heraldica Herald Petrel [66973]	Critically Endangered	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Breeding known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
[Thalassarche impavida](#)		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Thalassarche melanophris](#)		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Thalassarche salvini](#)		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Thalassarche steadi](#)		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
[Thinornis cucullatus cucullatus](#)		
Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area
[Tringa nebularia](#)		
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
[Tyto novaehollandiae castanops (Tasmanian population)](#)		
Masked Owl (Tasmanian) [67051]	Vulnerable	Species or species habitat known to occur within area
[Xenus cinereus](#)		
Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area
CRUSTACEAN		
[Astacopsis gouldi](#)		
Giant Freshwater Crayfish, Tasmanian Giant Freshwater Lobster [64415]	Vulnerable	Species or species habitat may occur within area
[Engaeus martigener](#)		
Furneaux Burrowing Crayfish [67220]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Euastacus bidawalus		
Bidhawal Crayfish, Bidawal Crayfish, East Gippsland Spiny Crayfish [83136]	Endangered	Species or species habitat known to occur within area
Euastacus diversus		
Orbost Spiny Crayfish [66782]	Endangered	Species or species habitat may occur within area
FISH		
Brachiopsilus ziebelli		
Ziebell's Handfish, Waterfall Bay Handfish [83757]	Vulnerable	Species or species habitat may occur within area
Epinephelus daemelii		
Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Galaxiella pusilla		
Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Endangered	Species or species habitat known to occur within area
Hippocampus whitei		
White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area
Hoplostethus atlanticus		
Orange Roughy, Deep-sea Perch, Red Roughy [68455]	Conservation Dependent	Species or species habitat likely to occur within area
Maccullochella peelii		
Murray Cod [66633]	Vulnerable	Translocated population known to occur within area
Macquaria australasica		
Macquarie Perch [66632]	Endangered	Translocated population known to occur within area
Mordacia praecox		
Non-parasitic Lamprey, Precocious Lamprey [81530]	Endangered	Species or species habitat likely to occur within area
Prototroctes maraena		
Australian Grayling [26179]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Rexea solandri (eastern Australian population)		
Eastern Gemfish [76339]	Conservation Dependent	Species or species habitat likely to occur within area
Seriolella brama		
Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area
Thymichthys politus		
Red Handfish [83756]	Critically Endangered	Species or species habitat may occur within area
FROG		
Heleioporus australiacus australiacus		
Giant Burrowing Frog, Eastern Owl Frog [92013]	Endangered	Species or species habitat known to occur within area
Heleioporus australiacus flavopunctatus		
Southern Owl Frog, Southern Giant Burrowing Frog [92014]	Endangered	Species or species habitat known to occur within area
Litoria aurea		
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Litoria littlejohni		
Northern Heath Frog, Littlejohn's Tree Frog [64733]	Endangered	Species or species habitat known to occur within area
Litoria watsoni		
Southern Heath Frog, Watson's Tree Frog [91509]	Endangered	Species or species habitat known to occur within area
Mixophyes balbus		
Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat known to occur within area
Ranoidea raniformis listed as Litoria raniformis		
Southern Bell Frog, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [94668]	Vulnerable	Species or species habitat known to occur within area
Uperoleia martini		
Martin's Toadlet [1873]	Endangered	Species or species habitat known to occur within area
INSECT		

Scientific Name	Threatened Category	Presence Text
Antipodia chaostola leucophaea		
Tasmanian Chaostola Skipper, Heath-sand Skipper [77672]	Endangered	Species or species habitat known to occur within area
Austrocordulia leonardi		
Sydney Hawk Dragonfly [84741]	Endangered	Species or species habitat likely to occur within area
Lissotes latidens		
Broad-toothed Stag Beetle, Wielangta Stag Beetle [66760]	Endangered	Species or species habitat known to occur within area
MAMMAL		
Antechinus minimus maritimus		
Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (Tasmanian population)		
Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat known to occur within area
Dasyurus viverrinus		
Eastern Quoll, Luaner [333]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Mastacomys fuscus mordicus Broad-toothed Rat (mainland), Tooarrana [87617]	Endangered	Species or species habitat may occur within area
Notamacropus parma Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area
Perameles gunnii gunnii Eastern Barred Bandicoot (Tasmania) [66651]	Vulnerable	Species or species habitat known to occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area
Potorous longipes Long-footed Potoroo [217]	Endangered	Species or species habitat known to occur within area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Pseudomys fumeus Smoky Mouse, Konoom [88]	Endangered	Species or species habitat likely to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Sarcophilus harrisii Tasmanian Devil [299]	Endangered	Translocated population known to occur within area
OTHER		
Dendronephthya australis Cauliflower Soft Coral [90325]	Endangered	Species or species habitat known to occur within area
PLANT		
Acacia baueri subsp. aspera [18662]	Endangered	Species or species habitat known to occur within area
Acacia bynoeana Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat likely to occur within area
Acacia caerulescens Limestone Blue Wattle, Buchan Blue, Buchan Blue Wattle [21883]	Vulnerable	Species or species habitat known to occur within area
Acacia constablei Narrabarba Wattle [10798]	Critically Endangered	Species or species habitat known to occur within area
Acacia georgensis Bega Wattle [9848]	Vulnerable	Species or species habitat known to occur within area
Acacia lanigera var. gracilipes [31652]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Acacia pubescens Downy Wattle, Hairy Stemmed Wattle [18800]	Vulnerable	Species or species habitat known to occur within area
Acacia terminalis subsp. Eastern Sydney (G.P.Phillips 126) listed as Acacia terminalis subsp. terminalis MS Sunshine Wattle (Sydney region) [91564]	Endangered	Species or species habitat known to occur within area
Allocasuarina glareicola [21932]	Endangered	Species or species habitat may occur within area
Allocasuarina portuensis Nielsen Park She-oak [21937]	Endangered	Species or species habitat known to occur within area
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area
Asterolasia elegans [56780]	Endangered	Species or species habitat may occur within area
Astrotricha crassifolia Thick-leaf Star-hair [10352]	Vulnerable	Species or species habitat known to occur within area
Astrotricha sp. Howe Range (D.E.Albrecht 1054) Long-leaf Star-hair [85676]	Critically Endangered	Species or species habitat known to occur within area
Astrotricha sp. Wingan Inlet (J.A.Jeanes 2268) Wingan Star-hair [85675]	Endangered	Species or species habitat known to occur within area
Banksia vincentia [88276]	Critically Endangered	Species or species habitat known to occur within area
Boronia deanei subsp. acutifolia [78946]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Caladenia ancylosa Genoa Spider-orchid, Gippsland Spider Orchid [84574]	Critically Endangered	Species or species habitat likely to occur within area
Caladenia caudata Tailed Spider-orchid [17067]	Vulnerable	Species or species habitat known to occur within area
Caladenia orientalis Eastern Spider Orchid [83410]	Endangered	Species or species habitat likely to occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area
Calochilus pulchellus Pretty Beard Orchid, Pretty Beard-orchid [84677]	Endangered	Species or species habitat known to occur within area
Cassinia rugata Wrinkled Cassinia, Wrinkled Dollybush [21885]	Vulnerable	Species or species habitat may occur within area
Commersonia prostrata Dwarf Kerrawang [87152]	Endangered	Species or species habitat known to occur within area
Conospermum hookeri Variable Smoke-bush [68161]	Vulnerable	Species or species habitat likely to occur within area
Correa baeuerlenii Chef's Cap [17007]	Vulnerable	Species or species habitat known to occur within area
Correa lawrenceana var. genoensis Genoa River Correa [66626]	Endangered	Species or species habitat may occur within area
Corunastylis rhyolitica listed as Genoplesium rhyoliticum Pambula Midge-orchid, Rhyolite Midge Orchid [78697]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Corunastylis vernalis listed as Genoplesium vernale		
East Lynne Midge-orchid [78699]	Vulnerable	Species or species habitat known to occur within area
Cryptostylis hunteriana		
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area
Cynanchum elegans		
White-flowered Wax Plant [12533]	Endangered	Species or species habitat known to occur within area
Daphnandra johnsonii		
Illawarra Socketwood [67186]	Endangered	Species or species habitat known to occur within area
Darwinia biflora		
[14619]	Vulnerable	Species or species habitat may occur within area
Deyeuxia ramosa		
Climbing Bent-grass [87970]	Critically Endangered	Species or species habitat known to occur within area
Dianella amoena		
Matted Flax-lily [64886]	Endangered	Species or species habitat known to occur within area
Dodonaea procumbens		
Trailing Hop-bush [12149]	Vulnerable	Species or species habitat known to occur within area
Epacris barbata		
Bearded Heath, Freycinet Heath [17625]	Endangered	Species or species habitat likely to occur within area
Epacris graniticola		
Mt Cameron Heath, Granite Heath [82822]	Critically Endangered	Species or species habitat may occur within area
Eucalyptus camfieldii		
Camfield's Stringybark [15460]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Eucalyptus stenostoma Jillaga Ash [3976]	Endangered	Species or species habitat may occur within area
Eucalyptus strzeleckii Strzelecki Gum [55400]	Vulnerable	Species or species habitat may occur within area
Eucalyptus sturgissiana Ettrema Mallee [18347]	Endangered	Species or species habitat may occur within area
Gaudium deanei listed as Leptospermum deanei Deane's Tea-tree [94344]	Vulnerable	Species or species habitat may occur within area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat known to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area
Haloragodendron lucasii Hal [6480]	Endangered	Species or species habitat likely to occur within area
Hibbertia acaulothrix [87409]	Endangered	Species or species habitat may occur within area
Hibbertia superans [84688]	Critically Endangered	Species or species habitat known to occur within area
Irenepharsus trypherus Delicate Cress, Illawarra Irene [14664]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Kunzea rupestris [8798]	Vulnerable	Species or species habitat may occur within area
Lasiopetalum joyceae [20311]	Vulnerable	Species or species habitat known to occur within area
Leionema ralstonii [64926]	Vulnerable	Species or species habitat known to occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat likely to occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area
Leucopogon exolasius Woronora Beard-heath [14251]	Vulnerable	Species or species habitat known to occur within area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat known to occur within area
Melaleuca deanei Deane's Melaleuca [5818]	Vulnerable	Species or species habitat known to occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat known to occur within area
Persoonia bargoensis Bargo Geebung [56267]	Endangered	Species or species habitat may occur within area
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Persoonia nutans Nodding Geebung [18119]	Endangered	Species or species habitat known to occur within area
Persoonia oxycoccoides [16114]	Endangered	Species or species habitat may occur within area
Phebalium daviesii Davies' Waxflower, St Helens Waxflower [16959]	Critically Endangered	Species or species habitat known to occur within area
Pimelea curviflora var. curviflora [4182]	Vulnerable	Species or species habitat known to occur within area
Pimelea spicata Spiked Rice-flower [20834]	Endangered	Species or species habitat known to occur within area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat likely to occur within area
Pomaderris cotoneaster Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat may occur within area
Pomaderris parrisiae Parris' Pomaderris [22119]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum affine Jervis Bay Leek Orchid [2210]	Endangered	Species or species habitat known to occur within area
Prasophyllum apoxychilum Tapered Leek-orchid [64947]	Endangered	Species or species habitat known to occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Prasophyllum secutum Northern Leek-orchid [64954]	Endangered	Species or species habitat likely to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Prostanthera densa Villous Mintbush [12233]	Vulnerable	Species or species habitat known to occur within area
Prostanthera galbraithiae Wellington Mintbush [64959]	Vulnerable	Species or species habitat known to occur within area
Prostanthera junonis Somersby Mintbush [64960]	Endangered	Species or species habitat known to occur within area
Prostanthera marifolia Seaforth Mintbush [7555]	Critically Endangered	Species or species habitat known to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat known to occur within area
Pterostylis saxicola Sydney Plains Greenhood [64537]	Endangered	Species or species habitat likely to occur within area
Pterostylis sp. Botany Bay (A.Bishop J221/1-13) Botany Bay Bearded Greenhood, Botany Bay Bearded Orchid [64965]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Pterostylis tenuissima Swamp Greenhood, Dainty Swamp Orchid [13139]	Vulnerable	Species or species habitat known to occur within area
Pterostylis vernalis Halbury Rustyhood [84711]	Critically Endangered	Species or species habitat may occur within area
Pterostylis ziegeleri Grassland Greenhood, Cape Portland Greenhood [64971]	Vulnerable	Species or species habitat likely to occur within area
Pultenaea aristata [18062]	Vulnerable	Species or species habitat known to occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat known to occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat may occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat known to occur within area
Spyridium cinereum Tiny Spyridium [13564]	Endangered	Species or species habitat known to occur within area
Stenanthemum pimeleoides Spreading Stenanthemum, Propellor Plant [15450]	Vulnerable	Species or species habitat may occur within area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat known to occur within area
Thelymitra jonesii Sky-blue Sun-orchid [76352]	Endangered	Species or species habitat known to occur within area
Thelymitra kangaloonica Kangaloon Sun Orchid [81861]	Critically Endangered	Species or species habitat likely to occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Endangered	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area
Thismia clavarioides [90425]	Endangered	Species or species habitat may occur within area
Triplarina nowraensis Nowra Heath-myrtle [64544]	Endangered	Species or species habitat known to occur within area
Westringia davidii [19079]	Vulnerable	Species or species habitat may occur within area
Xanthorrhoea arenaria Sand Grasstree [21603]	Vulnerable	Species or species habitat likely to occur within area
Xanthorrhoea bracteata Shiny Grasstree [7950]	Endangered	Species or species habitat known to occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Zieria granulata Hill Zieria, Hilly Zieria, Illawarra Zieria [17147]	Endangered	Species or species habitat likely to occur within area
Zieria tuberculata Warty Zieria [56736]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Hoplocephalus bungaroides Broad-headed Snake [1182]	Endangered	Species or species habitat known to occur within area
Lissolepis coventryi Swamp Skink, Eastern Mourning Skink [84053]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Pseudemoia rawlinsoni Glossy Grass Skink, Swampland Cool-skink, Rawlinson's Window-eyed Skink [59160]	Vulnerable	Species or species habitat known to occur within area
SHARK		

Scientific Name	Threatened Category	Presence Text
Carcharias taurus (east coast population)		
Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Congregation or aggregation known to occur within area
Carcharodon carcharias		
White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Centrophorus harrissoni		
Harrisson's Dogfish, Endeavour Dogfish, Dumb Gulper Shark, Harrison's Deepsea Dogfish [68444]	Conservation Dependent	Species or species habitat likely to occur within area
Centrophorus uyato		
Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Galeorhinus galeus		
Tope, Flake, Oil Shark, School Shark [68453]	Conservation Dependent	Species or species habitat likely to occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sphyrna lewini		
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area
SNAIL		
Meridolum maryae		
Maroubra Woodland Snail, Maroubra Land Snail [89884]	Endangered	Species or species habitat known to occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus		
Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area
Phaethon rubricauda Red-tailed Tropicbird [994]		Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis		
Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat likely to occur within area
Carcharias taurus Grey Nurse Shark [64469]		Congregation or aggregation known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat known to occur within area
Migratory Wetlands Species		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat known to occur within area
[Arenaria interpres](#) Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
[Calidris alba](#) Sanderling [875]		Roosting known to occur within area
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
[Calidris falcinellus as Limicola falcinellus](#) Broad-billed Sandpiper [91731]		Roosting known to occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area
[Calidris pugnax as Philomachus pugnax](#) Ruff [91256]		Roosting known to occur within area
[Calidris ruficollis](#) Red-necked Stint [860]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris subminuta Long-toed Stint [861]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
ANSTO Nuclear Medicine Pty Ltd	
Lot 24 DP883520 [AGPR007514]	NSW
Australian Broadcasting Corporation	
Lot 1 DP839399 [AGPR178]	NSW
Lot 62 DP853283 [AGPR166]	NSW
Australian Financial Security Authority	
Lot 7 DP249799 [AGPR5836]	NSW
Australian Postal Corporation	
Lot 11 DP10257 [AGPR7087]	NSW
Lot 11 DP18033 [AGPR7189]	NSW
Lot 1203 DP752067 [AGPR7173]	NSW
Lot 12 DP1087743 [AGPR7061]	NSW
Lot 19 DP13346 [AGPR7381]	NSW
Lot 19 DP800924 [AGPR7412]	NSW
Lot 1 DP106081 [AGPR7379]	NSW
Lot 1 DP208627 [AGPR7018]	NSW
Lot 1 DP392910 [AGPR7088]	NSW
Lot 1 DP570695 [AGPR7191]	NSW
Lot 1 DP749918 [AGPR7164]	NSW
Lot 1 DP776577 [AGPR7392]	NSW
Lot 1 DP843926 [AGPR7008]	NSW
Lot 20 DP800924 [AGPR7413]	NSW
Lot 2 DP530316 [AGPR7016]	NSW
Lot 2 DP616261 [AGPR7172]	NSW
Lot 2 DP85063 [AGPR7168]	NSW

Commonwealth Land Name	State
Lot 4 DP809842 [AGPR7026]	NSW
PC354906M [AGPR6975]	VIC
Volume 31503 Folio 1 [AGPR7368]	TAS
Department of Climate Change, Energy, the Environment and Water	
Admiralty House and Lodge [CHL_105398]	NSW
Admiralty House Garden and Fortifications [CHL_105399]	NSW
Army Cottage with return verandah [CHL_105404]	NSW
Barracks Group HMAS Watson [CHL_105582]	NSW
Batteries A83 and C9A [CHL_105577]	NSW
Battery B42 [CHL_105576]	NSW
Battery for Five Guns [CHL_105247]	NSW
Beecroft Peninsula [CHL_105539]	NSW
Bondi Beach Post Office [CHL_106174]	NSW
Booderee Botanic Gardens (Commonwealth) [CAPAD_CWTH_02]	JBT
Booderee National Park (Commonwealth) [CAPAD_CWTH_03]	JBT
Botany Post Office [CHL_106143]	NSW
Buildings 31 and 32 [CHL_105287]	NSW
Buildings MQVB16 and VB56 [CHL_105280]	NSW
Buildings VB13, 15, 16 & 17 [CHL_105279]	NSW
Buildings VB41, 45 & 53 [CHL_105278]	NSW
Buildings VB60 and VB62 [CHL_105283]	NSW
Buildings VB69, 75 & 76 including Garden [CHL_105303]	NSW
Buildings VB83, 84, 85, 87 & 89 [CHL_105304]	NSW
Buildings VB90, 91, 91A & 92 [CHL_105305]	NSW
Building VB1 and Parade Ground [CHL_105302]	NSW
Building VB2 Guard House [CHL_105282]	NSW
Cape Baily Lighthouse [CHL_105571]	NSW

Commonwealth Land Name	State
Cape St George Lighthouse Ruins & Curtilage [CHL_105312]	ACT
Chain and Anchor Store (former) [CHL_105293]	NSW
Chowder Bay Barracks Group [CHL_105254]	NSW
Christians Minde Settlement [CHL_105314]	ACT
Cliff House [CHL_105392]	NSW
Commonwealth Avenue Defence Housing [CHL_105586]	NSW
Cottage at Macquarie Lighthouse [CHL_105411]	NSW
Cronulla Post Office [CHL_106203]	NSW
Customs Marine Centre [CHL_105249]	NSW
Defence site - Georges Heights and Middle Head [CHL_105541]	NSW
Eddystone Lighthouse [CHL_105565]	TAS
Factory [CHL_105290]	NSW
Gabo Island Lighthouse [CHL_105379]	VIC
Garden Island Precinct [CHL_105286]	NSW
Gazebo [CHL_105306]	NSW
General Post Office [CHL_105509]	NSW
Golf Clubhouse (former) [CHL_105575]	NSW
Goose Island Lighthouse [CHL_105564]	TAS
Headquarters 8th Brigade Precinct [CHL_105574]	NSW
Headquarters Training Command Precinct [CHL_105584]	NSW
HMAS Penguin [CHL_105581]	NSW
Jervis Bay Botanic Gardens [CHL_105400]	ACT
Jervis Bay Territory [CHL_105394]	ACT
Kiama Post Office [CHL_105508]	NSW
Kirribilli House [CHL_105451]	NSW
Kirribilli House Garden & Grounds [CHL_105589]	NSW
Macquarie Lighthouse [CHL_105366]	NSW

Commonwealth Land Name	State
Macquarie Lighthouse Group [CHL_105365]	NSW
Macquarie Lighthouse Surrounding Wall [CHL_105412]	NSW
Marine Biological Station (former) [CHL_105450]	NSW
Military Road Framework - Defence Land [CHL_105572]	NSW
Montague Island Lighthouse [CHL_105601]	NSW
Naval Store [CHL_105291]	NSW
Navy Refuelling Depot and Caretakers House [CHL_105583]	NSW
North Head Artillery Barracks [CHL_105431]	NSW
North Sydney Post Office [CHL_106144]	NSW
Office Building [CHL_105292]	NSW
Officers Mess, HQ Training Command [CHL_105248]	NSW
Paddington Post Office [CHL_105300]	NSW
Point Perpendicular Lightstation [CHL_105364]	NSW
Reserve Bank [CHL_105456]	NSW
Residences Group [CHL_105289]	NSW
Rigging Shed and Chapel [CHL_105288]	NSW
Royal Australian Naval College [CHL_105380]	ACT
School of Musketry and Officers Mess, Randwick Army Barracks [CHL_105651]	NSW
Shark Point Battery [CHL_105324]	NSW
Swan Island Lighthouse [CHL_105598]	TAS
Sydney Airport Air Traffic Control Tower [CHL_106116]	NSW
Sydney Customs House (former) [CHL_105436]	NSW
Ten Terminal Regiment Headquarters and AusAid Training Centre [CHL_105587]	NSW
Thirty Terminal Squadron Precinct [CHL_105585]	NSW
Victoria Barracks Perimeter Wall and Gates [CHL_105281]	NSW
Victoria Barracks Precinct [CHL_105277]	NSW

Commonwealth Land Name	State
Victoria Barracks Squash Courts [CHL_105295]	NSW
Wilsons Promontory Lighthouse [CHL_105375]	VIC
Department of Defence	
A.C. Lewis House [DD_1413]	NSW
AAC 206 Army Cadet Unit - North Sydney [DD_3197]	NSW
AAC 222 Army Cadet Unit - South Coast [DD_3152]	NSW
AAC Shore Grammar School [DD_3188]	NSW
AAC St. Aloysius College [DD_3195]	NSW
AAC Sydney High School [DD_3189]	NSW
AAC The Scots College [DD_3194]	NSW
AAC Waverley College [DD_3193]	NSW
Banksmeadow Training Depot [DD_0396]	NSW
Bass Pyramid Weapon Range - Bass Strait [DD_0981]	VIC
Beecroft Rapier Range [AGPR706]	NSW
Beecroft Rapier Range [AGPR705]	NSW
Beecroft Weapons Range [DD_0027]	NSW
Bherwerre Ridge Communications Facility [DD_0019]	ACT
Carpark - Defence Plaza Sydney [DD_1488]	NSW
Defence Plaza Sydney [DD_1163]	NSW
Degaussing Range Support Facility [DD_0037]	NSW
Devils Tower Weapon Range - Bass Strait [DD_0976]	VIC
Dutson Bombing Range [AGPR3781]	VIC
Dutson Bombing Range [AGPR3782]	VIC
Dutson Bombing Range [AGPR3784]	VIC
Dutson Bombing Range [AGPR3775]	VIC
Dutson Bombing Range [AGPR3753]	VIC
Dutson Bombing Range [AGPR3780]	VIC

Commonwealth Land Name	State
Dutson Bombing Range [AGPR3779]	VIC
Dutson Bombing Range [AGPR3749]	VIC
Dutson Bombing Range [AGPR3743]	VIC
Dutson Bombing Range [DD_0916]	VIC
Eden Navy Wharf Establishment [DD_0288]	NSW
Fleet Base East - Woolloomooloo [DD_1560]	NSW
Fleet Base Garden Island [AGPR739]	NSW
Fleet Base Garden Island [AGPR731]	NSW
Fleet Base Garden Island [AGPR730]	NSW
Fleet Base Garden Island [AGPR729]	NSW
Fleet Base Garden Island [AGPR916]	NSW
Fleet Base Garden Island [AGPR728]	NSW
Fleet Base Garden Island [AGPR724]	NSW
Fleet Base Garden Island [AGPR725]	NSW
Fleet Base Garden Island [AGPR726]	NSW
Fleet Base Garden Island [AGPR727]	NSW
Fleet Base Garden Island [AGPR693]	NSW
Fleet Base Garden Island [AGPR503]	NSW
Fleet Base Garden Island [AGPR510]	NSW
Fleet Headquarters [DD_1404]	NSW
Garden Island - Sydney [DD_1022]	NSW
HMAS Albatross [AGPR779]	NSW
HMAS Albatross [AGPR778]	NSW
HMAS Creswell [DD_0020]	ACT
HMAS Kuttabul [DD_0045]	NSW
HMAS Penguin [DD_0030]	NSW
HMAS Watson [DD_0056]	NSW

Commonwealth Land Name	State
Hyams Beach Communications Facility [DD_1179]	NSW
Hydrographics Office - Wollongong [DD_1434]	NSW
Jervis Bay Airfield (JBAF) [DD_0021]	ACT
JLC Twofold Bay Munitions Depot [DD_0289]	NSW
Joint Cyber Security Centre - Sydney [DD_0511]	NSW
Kensington Training Depot [DD_0387]	NSW
Lady Bay Beach Watsons Bay [DD_3013]	NSW
Lake Illawarra Cadet Facility [DD_3156]	NSW
Lot 10 DP1150819 [AGPR6439]	NSW
Lot 11 DP1150819 [AGPR6438]	NSW
Lot 12 DP1150819 [AGPR6436]	NSW
Lot 13 DP1042814 [AGPR504]	NSW
Lot 13 DP1150819 [AGPR6435]	NSW
Lot 14 DP1150819 [AGPR6434]	NSW
Lot 15 DP1150819 [AGPR6433]	NSW
Lot 1625 Plan 752011 [AGPR529]	NSW
Lot 1627 DP752011 [AGPR599]	NSW
Lot 16 DP1150819 [AGPR6432]	NSW
Lot 17 DP1150819 [AGPR6431]	NSW
Lot 18 DP1150819 [AGPR6430]	NSW
Lot 19 DP1150819 [AGPR6429]	NSW
Lot 1 DP1150819 [AGPR6452]	NSW
Lot 1 DP440625 [AGPR614]	NSW
Lot 1 DP607550 [AGPR809]	NSW
Lot 1 DP700616 [AGPR915]	NSW
Lot 1 DP812885 [AGPR419]	NSW
Lot 1 Plan 1063890 [AGPR736]	NSW

Commonwealth Land Name	State
Lot 201 DP1022020 [AGPR788]	NSW
Lot 20 DP1150819 [AGPR6428]	NSW
Lot 21 DP1150819 [AGPR6427]	NSW
Lot 22 DP1150819 [AGPR6424]	NSW
Lot 23 DP1150819 [AGPR6423]	NSW
Lot 24 DP1150819 [AGPR6421]	NSW
Lot 25 DP1150819 [AGPR6420]	NSW
Lot 26 DP1150819 [AGPR6418]	NSW
Lot 27 DP1150819 [AGPR6416]	NSW
Lot 28 DP1150819 [AGPR6415]	NSW
Lot 29 DP1150819 [AGPR6414]	NSW
Lot 2 DP1068011 [AGPR905]	NSW
Lot 2 DP1150819 [AGPR6449]	NSW
Lot 30 DP1150819 [AGPR6413]	NSW
Lot 31 DP1150819 [AGPR6411]	NSW
Lot 32 DP1150819 [AGPR6453]	NSW
Lot 33 DP1150819 [AGPR6450]	NSW
Lot 34 DP1150819 [AGPR6437]	NSW
Lot 35 DP1150819 [AGPR6426]	NSW
Lot 36 DP1150819 [AGPR6409]	NSW
Lot 3 DP1150819 [AGPR6448]	NSW
Lot 4 DP1150819 [AGPR6446]	NSW
Lot 4 DP605078 [AGPR723]	NSW
Lot 52 DP914687 [AGPR6461]	NSW
Lot 5 DP1150819 [AGPR6445]	NSW
Lot 6 DP1150819 [AGPR6444]	NSW
Lot 7 DP1150819 [AGPR6442]	NSW

Commonwealth Land Name	State
Lot 8 DP1150819 [AGPR6441]	NSW
Lot 9 DP1150819 [AGPR6440]	NSW
NFI Chowder Bay [DD_0034]	NSW
Point Perpendicular Lighthouse [DD_1521]	NSW
RAN Band Sydney Detachment Waterloo [DD_1572]	NSW
Randwick Barracks [AGPR827]	NSW
Randwick Barracks [DD_0407]	NSW
Randwick Barracks [AGPR445]	NSW
Rockdale Training Depot [DD_0389]	NSW
Sydney Grammar School - Cadets [DD_3186]	NSW
Victoria Barracks - Paddington [DD_0402]	NSW
Wollongong Training Depot [DD_0434]	NSW
Woolloomooloo Carpark [DD_1403]	NSW
Department of Finance	
CLC - Sydney Commonwealth Law Courts NSW [AGPR007627]	NSW
CLC - Sydney Commonwealth Law Courts NSW [AGPR007626]	NSW
CLC - Sydney Commonwealth Law Courts NSW [AGPR4596]	NSW
Jervis Bay Court and Police Station [AGPR007676]	NSW
Malabar Anzac Rifle Range [AGPR4599]	NSW
Neutral Bay Admin (Customs House) [AGPR4576]	NSW
Department of Home Affairs	
Lot 412 DP1081599 [AGPR6053]	NSW
Lot 5 DP1062089 [AGPR6054]	NSW
Department of Infrastructure, Transport, Regional Development, Communications and the Arts	
Lot 1 DP107987 [AGPR4869]	NSW
Sydney Airport [AGPR4984]	NSW
Sydney Airport [AGPR4771]	NSW
Sydney Airport [AGPR4772]	NSW

Commonwealth Land Name	State
Sydney Airport [AGPR4959]	NSW
Sydney Airport [AGPR4881]	NSW
Sydney Airport [AGPR4961]	NSW
Sydney Airport [AGPR4960]	NSW
Sydney Airport [AGPR4965]	NSW
Sydney Airport [AGPR4968]	NSW
Sydney Airport [AGPR4966]	NSW
Sydney Airport [AGPR4780]	NSW
Sydney Airport [AGPR4967]	NSW
Sydney Airport [AGPR4976]	NSW
Sydney Airport [AGPR4974]	NSW
Sydney Airport [AGPR4977]	NSW
Sydney Airport [AGPR4979]	NSW
Sydney Airport [AGPR4978]	NSW
Sydney Airport [AGPR4971]	NSW
Sydney Airport [AGPR4970]	NSW
Sydney Airport [AGPR4973]	NSW
Sydney Airport [AGPR4975]	NSW
Sydney Airport [AGPR4801]	NSW
Sydney Airport [AGPR4880]	NSW
Sydney Airport [AGPR4891]	NSW
Sydney Airport [AGPR4893]	NSW
Sydney Airport [AGPR4969]	NSW
Sydney Airport [AGPR4770]	NSW
Sydney Airport [AGPR4983]	NSW
Sydney Airport [AGPR4980]	NSW
Sydney Airport [AGPR4985]	NSW

Commonwealth Land Name	State
Sydney Airport [AGPR4769]	NSW
Sydney Airport [AGPR4857]	NSW
Sydney Airport [AGPR4870]	NSW
Sydney Airport [AGPR4972]	NSW
Department of the Prime Minister and Cabinet	
Lot 109 DP1151872 [AGPR007705]	NSW
Office of the Official Secretary to the Governor-General	
Lot 12 DP13064 [AGPR6399]	NSW
Lot 18 DP13064 [AGPR6400]	NSW
Lot 19 DP13064 [AGPR6401]	NSW
Lot 1 DP1131885 [AGPR6402]	NSW
Lot 867 DP752067 [AGPR6398]	NSW
Sydney Harbour Federation Trust	
Lot 106 DP1079507 [AGPR5829]	NSW
Lot 19 DP233157 [AGPR5831]	NSW
Lot 1 DP1180054 [AGPR5824]	NSW
Lot 1 DP801240 [AGPR6405]	NSW
Lot 1 DP811578 [AGPR6406]	NSW
Lot 1 DP831153 [AGPR5819]	NSW
Lot 202 DP1022020 [AGPR5822]	NSW
Lot 203 DP1022020 [AGPR5823]	NSW
Lot 2764 DP752038 [AGPR5828]	NSW
Lot 2 DP1180054 [AGPR5825]	NSW
Lot 2 DP536603 [AGPR6407]	NSW
Lot 2 DP541799 [AGPR5830]	NSW
Lot 2 DP811578 [AGPR5820]	NSW
Lot 4 DP801240 [AGPR6408]	NSW
Lot 5 DP801240 [AGPR5816]	NSW

Commonwealth Land Name	State
Lot 6 DP801240 [AGPR6404]	NSW
Lot A DP109583 [AGPR5826]	NSW

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Historic		
Admiralty House and Lodge	NSW	Listed place
Admiralty House Garden and Fortifications	NSW	Listed place
Army Cottage with return verandah	NSW	Listed place
Barracks Group HMAS Watson	NSW	Listed place
Batteries A83 and C9A	NSW	Listed place
Battery B42	NSW	Listed place
Battery for Five Guns	NSW	Listed place
Botany Post Office	NSW	Listed place
Buildings 31 and 32	NSW	Listed place
Buildings MQVB16 and VB56	NSW	Listed place
Buildings VB13, 15, 16 & 17	NSW	Listed place
Buildings VB41, 45 & 53	NSW	Listed place
Buildings VB60 and VB62	NSW	Listed place
Buildings VB69, 75 & 76 including Garden	NSW	Listed place
Buildings VB83, 84, 85, 87 & 89	NSW	Listed place
Buildings VB90, 91, 91A & 92	NSW	Listed place
Building VB1 and Parade Ground	NSW	Listed place
Building VB2 Guard House	NSW	Listed place
Cape Baily Lighthouse	NSW	Listed place
Cape St George Lighthouse Ruins & Curtilage	ACT	Listed place
Chain and Anchor Store (former)	NSW	Listed place
Chowder Bay Barracks Group	NSW	Listed place
Christians Minde Settlement	ACT	Listed place

Name	State	Status
Cliff House	NSW	Listed place
Commonwealth Avenue Defence Housing	NSW	Listed place
Cottage at Macquarie Lighthouse	NSW	Listed place
Cronulla Post Office	NSW	Listed place
Customs Marine Centre	NSW	Listed place
Defence site - Georges Heights and Middle Head	NSW	Listed place
Eddystone Lighthouse	TAS	Listed place
Factory	NSW	Listed place
Gabo Island Lighthouse	VIC	Listed place
Garden Island Precinct	NSW	Listed place
Gazebo	NSW	Listed place
Golf Clubhouse (former)	NSW	Listed place
Goose Island Lighthouse	TAS	Listed place
Headquarters 8th Brigade Precinct	NSW	Listed place
Headquarters Training Command Precinct	NSW	Listed place
HMAS Penguin	NSW	Listed place
Jervis Bay Botanic Gardens	ACT	Listed place
Kiama Post Office	NSW	Listed place
Kirribilli House	NSW	Listed place
Kirribilli House Garden & Grounds	NSW	Listed place
Macquarie Lighthouse	NSW	Listed place
Macquarie Lighthouse Group	NSW	Listed place
Macquarie Lighthouse Surrounding Wall	NSW	Listed place
Marine Biological Station (former)	NSW	Listed place
Military Road Framework - Defence Land	NSW	Listed place
Montague Island Lighthouse	NSW	Listed place

Name	State	Status
Naval Store	NSW	Listed place
Navy Refuelling Depot and Caretakers House	NSW	Listed place
North Head Artillery Barracks	NSW	Listed place
North Sydney Post Office	NSW	Listed place
Office Building	NSW	Listed place
Officers Mess, HQ Training Command	NSW	Listed place
Paddington Post Office	NSW	Listed place
Point Perpendicular Lightstation	NSW	Listed place
Reserve Bank	NSW	Listed place
Residences Group	NSW	Listed place
Rigging Shed and Chapel	NSW	Listed place
Royal Australian Naval College	ACT	Listed place
School of Musketry and Officers Mess, Randwick Army Barracks	NSW	Listed place
Shark Point Battery	NSW	Listed place
Swan Island Lighthouse	TAS	Listed place
Sydney Airport Air Traffic Control Tower	NSW	Listed place
Sydney Customs House (former)	NSW	Listed place
Ten Terminal Regiment Headquarters and AusAid Training Centre	NSW	Listed place
Thirty Terminal Squadron Precinct	NSW	Listed place
Victoria Barracks Perimeter Wall and Gates	NSW	Listed place
Victoria Barracks Precinct	NSW	Listed place
Victoria Barracks Squash Courts	NSW	Listed place
Wilsons Promontory Lighthouse	VIC	Listed place
Indigenous		
Crocodile Head Area	NSW	Within listed place
Currarong Rockshelters Area	NSW	Within listed place

Name	State	Status
Jervis Bay Territory	ACT	Listed place
Natural		
Beecroft Peninsula	NSW	Listed place

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area
Ardenna pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Ardenna tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris falcinellus as Limicola falcinellus Broad-billed Sandpiper [91731]		Roosting known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area
Calidris subminuta Long-toed Stint [861]		Roosting known to occur within area overfly marine area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Roosting known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus dominicanus Kelp Gull [809]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Breeding known to occur within area overfly marine area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
Morus serrator Australasian Gannet [1020]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area overfly marine area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Pelecanoides urinatrix Common Diving-Petrel [1018]		Breeding known to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area
Phaethon rubricauda Red-tailed Tropicbird [994]		Species or species habitat known to occur within area
Phalacrocorax fuscescens Black-faced Cormorant [59660]		Breeding known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Breeding likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna striata White-fronted Tern [799]		Breeding known to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Thalasseus bergii as Sterna bergii		
Greater Crested Tern [83000]		Breeding known to occur within area
Thinornis cucullatus as Thinornis rubricollis		
Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area
Thinornis cucullatus cucullatus as Thinornis rubricollis rubricollis		
Eastern Hooded Plover, Eastern Hooded Plover [90381]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Tringa brevipes as Heteroscelus brevipes		
Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola		
Wood Sandpiper [829]		Roosting known to occur within area overfly marine area
Tringa incana as Heteroscelus incanus		
Wandering Tattler [831]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
[Tringa stagnatilis](#) Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
[Xenus cinereus](#) Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area
Fish		
[Acentronura tentaculata](#) Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
[Cosmocampus howensis](#) Lord Howe Pipefish [66208]		Species or species habitat may occur within area
[Festucalex cinctus](#) Girdled Pipefish [66214]		Species or species habitat may occur within area
[Filicampus tigris](#) Tiger Pipefish [66217]		Species or species habitat may occur within area
[Heraldia nocturna](#) Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
[Hippichthys penicillus](#) Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
[Hippocampus abdominalis](#) Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
[Hippocampus breviceps](#) Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus minotaur Bullneck Seahorse [66705]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Mitotichthys mollisoni Mollison's Pipefish [66260]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area
Mammal		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
[Dugong dugon](#)		
Dugong [28]		Species or species habitat may occur within area
Reptile		
[Caretta caretta](#)		
Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
[Chelonia mydas](#)		
Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
[Dermochelys coriacea](#)		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
[Eretmochelys imbricata](#)		
Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
[Hydrophis elegans](#)		
Elegant Sea Snake, Bar-bellied Sea Snake [1104]		Species or species habitat may occur within area
[Hydrophis platura as Pelamis platurus](#)		
Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area
[Natator depressus](#)		
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Whales and Other Cetaceans		[Resource Information]
Current Scientific Name	Status	Type of Presence
Mammal		
[Balaenoptera acutorostrata](#)		
Minke Whale [33]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Berardius arnuxii Arnoux's Beaked Whale [70]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Feresa attenuata Pygmy Killer Whale [61]		Species or species habitat may occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Hyperoodon planifrons Southern Bottlenose Whale [71]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon ginkgodens Gingko-toothed Beaked Whale, Gingko-toothed Whale, Gingko Beaked Whale [59564]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon hectori Hector's Beaked Whale [76]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Peponocephala electra Melon-headed Whale [47]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Stenella coeruleoalba Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area
Stenella longirostris Long-snouted Spinner Dolphin [29]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Steno bredanensis Rough-toothed Dolphin [30]		Species or species habitat may occur within area
Tasmacetus shepherdi Shepherd's Beaked Whale, Tasman Beaked Whale [55]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Commonwealth Reserves Terrestrial [Resource Information]

Name	State	Type
Booderee	JBT	Botanic Gardens (Commonwealth)
Booderee	JBT	National Park (Commonwealth)

Australian Marine Parks [Resource Information]

Park Name	Zone & IUCN Categories
Central Eastern	Habitat Protection Zone (IUCN IV)
Flinders	Habitat Protection Zone (IUCN IV)
Freycinet	Habitat Protection Zone (IUCN IV)
Hunter	Habitat Protection Zone (IUCN IV)
Jervis	Habitat Protection Zone (IUCN IV)
Beagle	Multiple Use Zone (IUCN VI)
East Gippsland	Multiple Use Zone (IUCN VI)

Park Name	Zone & IUCN Categories
Flinders	Multiple Use Zone (IUCN VI)
Freycinet	Multiple Use Zone (IUCN VI)
Beagle	National Park Zone (IUCN II)
Flinders	National Park Zone (IUCN II)
Flinders	National Park Zone (IUCN II)
Flinders	National Park Zone (IUCN II)
Freycinet	National Park Zone (IUCN II)
Freycinet	National Park Zone (IUCN II)
Freycinet	Recreational Use Zone (IUCN IV)
Jervis	Special Purpose Zone (Trawl) (IUCN VI)

Extra Information

State and Territory Reserves

[Resource Information]

Protected Area Name	Reserve Type	State
ALBERTON EAST FLORA & FAUNA RESERVE	Nature Conservation Reserve	VIC
Anderson Islands	Conservation Area	TAS
Anser Island	Reference Area	VIC
Ansons Bay	Conservation Area	TAS
Arthur Bay	Conservation Area	TAS
Baawang	Reference Area	VIC
Badger Corner	Private Sanctuary	TAS
Bancroft Bay - Kalimna G.L.R.	Natural Features Reserve	VIC
Barren Grounds	Nature Reserve	NSW
Barunguba Montague Island	Nature Reserve	NSW
Bass Pyramid	Nature Reserve	TAS
Batemans	Marine Park	NSW

Protected Area Name	Reserve Type	State
Battery Island	Conservation Area	TAS
Baxter Island G.L.R.	Natural Features Reserve	VIC
Bay of Fires	Conservation Area	TAS
Bell Bird Creek	Nature Reserve	NSW
Belowla Island	Nature Reserve	NSW
Bemm, Goolengook, Arte and Errinundra Rivers	Heritage River	VIC
Benedore River	Reference Area	VIC
Beowa	National Park	NSW
Berkeley	Nature Reserve	NSW
Bermaguee	Nature Reserve	NSW
Bermagui	Flora Reserve	NSW
Beware Reef	Marine Sanctuary	VIC
Biamanga	National Park	NSW
Big Green Island	Nature Reserve	TAS
Big Silver	Conservation Covenant	TAS
Binalongtime	Conservation Covenant	TAS
Blond Bay G.L.R.	Natural Features Reserve	VIC
Blond Bay W.R.	Natural Features Reserve	VIC
Blyth Point	Conservation Area	TAS
Boat Harbour	Aquatic Reserve	NSW
Boat Harbour Road Killiecrankie	Conservation Covenant	TAS
Boggy Creek	Conservation Area	TAS
Bournda	Nature Reserve	NSW
Bournda	National Park	NSW
Boxen Island	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Briggs Islet	Conservation Area	TAS
Brodribb River F.F.R	Nature Conservation Reserve	VIC
Bronte-Coogee	Aquatic Reserve	NSW
Brougham Sugarloaf	Conservation Area	TAS
Broulee Island	Nature Reserve	NSW
Brush Island	Nature Reserve	NSW
Bun Beetons Point	Conservation Area	TAS
Bushrangers Bay	Aquatic Reserve	NSW
Cabbage Tree Bay	Aquatic Reserve	NSW
Cabbage Tree Creek F.R	Nature Conservation Reserve	VIC
Cape Banks	Aquatic Reserve	NSW
Cape Conran Coastal Park	Conservation Park	VIC
Cape Howe	Wilderness Zone	VIC
Cape Howe	Marine National Park	VIC
Cat Island	Conservation Area	TAS
Chalky Island	Conservation Area	TAS
Chappell Islands	Nature Reserve	TAS
Chimneys Lagoon	Conservation Covenant	TAS
Clyde River	National Park	NSW
Comerong Island	Nature Reserve	NSW
Cone Islet	Conservation Area	TAS
Conjola	National Park	NSW
Corner Inlet	Marine National Park	VIC
Corner Inlet Marine and Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
Corramy	Regional Park	NSW

Protected Area Name	Reserve Type	State
Craggy Island	Conservation Area	TAS
Croajingolong	National Park	VIC
Cullendulla Creek	Nature Reserve	NSW
Cullunghutti	Aboriginal Area	NSW
Curtis Island	Nature Reserve	TAS
Darling Range	Conservation Area	TAS
Darriman H29 B.R	Natural Features Reserve	VIC
Devils Tower	Nature Reserve	TAS
Dharawal	Nature Reserve	NSW
Dianas Basin	Conservation Covenant	TAS
Doctors Peak	Regional Reserve	TAS
Double Creek	Natural Catchment Area	VIC
Doughboy Island	Conservation Area	TAS
Eagles Claw	Nature Reserve	NSW
East Gippsland Coastal streams	Natural Catchment Area	VIC
East Kangaroo Island	Nature Reserve	TAS
East Moncoeur Island	Conservation Area	TAS
Eddystone Point Lighthouse	Historic Site	TAS
Egg Beach	Conservation Area	TAS
Emita	Nature Recreation Area	TAS
Entrance Point	Reference Area	VIC
Eurobodalla	National Park	NSW
Ewing Morass W.R	Natural Features Reserve	VIC
First and Second Islands F.R.	Nature Conservation Reserve	VIC

Protected Area Name	Reserve Type	State
Five Islands	Nature Reserve	NSW
Flannagan Island G.L.R.	Natural Features Reserve	VIC
Foochow	Conservation Area	TAS
Forsyth Island	Conservation Area	TAS
Fotheringate Bay	Conservation Area	TAS
Fraser Island G.L.R.	Natural Features Reserve	VIC
Fresh-water Swamp, Woodside Beach W.R	Natural Features Reserve	VIC
Freycinet	National Park	TAS
Garawarra	State Conservation Area	NSW
Gardens Road	Conservation Covenant	TAS
Garigal	National Park	NSW
George River - St Helens	Conservation Covenant	TAS
George Rocks	Nature Reserve	TAS
Giffard H31 B.R	Natural Features Reserve	VIC
Gippsland Lakes Coastal Park	Conservation Park	VIC
Goose Island	Conservation Area	TAS
Great Musselroe River	Conservation Area	TAS
Gulaga	National Park	NSW
Gull Island	Conservation Area	TAS
Heathcote	National Park	NSW
Hogan Group	Conservation Area	TAS
Holts Point	Conservation Area	TAS
Humbug Point	Nature Recreation Area	TAS
Ile des Phoques	Nature Reserve	TAS
Illawarra Escarpment	State Conservation Area	NSW

Protected Area Name	Reserve Type	State
Illawong	Nature Reserve	NSW
Isabella Island	Nature Reserve	TAS
Jack Smith Lake W.R	Natural Features Reserve	VIC
Jacksons Cove	Conservation Area	TAS
Jervis Bay	National Park	NSW
Jervis Bay	Marine Park	NSW
Kamay Botany Bay	National Park	NSW
Kent Group	National Park	TAS
Killalea	Regional Park	NSW
Killiecrankie	Nature Recreation Area	TAS
Kuhns Rd Memana	Conservation Covenant	TAS
Lackrana	Conservation Area	TAS
Lake Coleman W.R	Natural Features Reserve	VIC
Lake Corringle W.R	Natural Features Reserve	VIC
Lake Curlip W.R.	Natural Features Reserve	VIC
Lake Denison W.R	Natural Features Reserve	VIC
Lake Tyers S.P.	State Park	VIC
Lanark Farm #1	Conservation Covenant	TAS
Lanark Farm #2	Conservation Covenant	TAS
Lanark Farm #3	Conservation Covenant	TAS
Lanark Farm #4	Conservation Covenant	TAS
Lanark Farm #5	Conservation Covenant	TAS
Lanark Farm #6	Conservation Covenant	TAS
Lands End	Conservation Covenant	TAS
Lighthouse Point	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Lime Pit Road	Conservation Area	TAS
Little Chalky Island	Conservation Area	TAS
Little Dog Island	Game Reserve	TAS
Little Green Island	Conservation Area	TAS
Little Island	Conservation Area	TAS
Little Silver	Conservation Covenant	TAS
Little Swan Island	Nature Reserve	TAS
Logan Lagoon	State Reserve	TAS
Logan Lagoon	Conservation Area	TAS
Logans Lagoon	Conservation Covenant	TAS
Long Island	Conservation Area	TAS
Low Islets	Nature Reserve	TAS
Low Point	Conservation Area	TAS
Lughrata	Conservation Covenant	TAS
Lyall Road Binalong Bay	Conservation Covenant	TAS
Malabar Headland	National Park	NSW
Mallacoota B.R.	Natural Features Reserve	VIC
Maria Island	National Park	TAS
Marriott Reef	Conservation Area	TAS
Marshall Beach	Conservation Area	TAS
Marthvale	Conservation Covenant	TAS
McDonalds Point	Conservation Area	TAS
Medeas Cove	Conservation Area	TAS
Meroo	National Park	NSW
Metung B.R.	Natural Features Reserve	VIC
Mile Island	Conservation Area	TAS

Protected Area Name	Reserve Type	State
Mimosa Rocks	National Park	NSW
Moriarty Rocks	Nature Reserve	TAS
Morley Swamp G.L.R.	Natural Features Reserve	VIC
Mount Pearson	State Reserve	TAS
Mount Tanner	Nature Recreation Area	TAS
Mount Vereker Creek	Natural Catchment Area	VIC
Mount William	Conservation Area	TAS
Mount William	National Park	TAS
Mulligans Hill	Conservation Covenant	TAS
Mulligans Hill	Conservation Area	TAS
Mumbulla	Flora Reserve	NSW
Murrah	Flora Reserve	NSW
Murramarang	National Park	NSW
Murramarang	Aboriginal Area	NSW
Musselroe Bay	Conservation Covenant	TAS
Musselroe Bay	Conservation Area	TAS
Nadgee	Nature Reserve	NSW
Nameless Sylvan	Conservation Reserve	NSW
Narrawallee Creek	Nature Reserve	NSW
Neds Reef	Conservation Area	TAS
Night Island	Conservation Area	TAS
Ninety Mile Beach	Marine National Park	VIC
Nooramunga Marine & Coastal Park	National Parks Act Schedule 4 park or reserve	VIC
NOORAMUNGA STATE FAUNAL RESERVE	Nature Conservation Reserve	VIC
North East Islet	Nature Reserve	TAS

Protected Area Name	Reserve Type	State
North East River	Game Reserve	TAS
North Sydney Harbour	Aquatic Reserve	NSW
Nungurner B.R.	Natural Features Reserve	VIC
Nyerimilang Park G.L.R.	Natural Features Reserve	VIC
Oyster Rocks	Conservation Area	TAS
Paddys Island	Nature Reserve	TAS
Palana Beach	Nature Recreation Area	TAS
Parnella	Conservation Area	TAS
Pasco Group	Conservation Area	TAS
Passage Island	Conservation Area	TAS
Patriarchs	Private Sanctuary	TAS
Patriarchs	Conservation Area	TAS
Point Hicks	Marine National Park	VIC
Prime Seal Island	Conservation Area	TAS
Rame Head	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Ram Island	Conservation Area	TAS
Raymond Island G.L.R.	Natural Features Reserve	VIC
Reedy Lagoon	Private Nature Reserve	TAS
Reef Island	Conservation Area	TAS
Rigby Island G.L.R.	Natural Features Reserve	VIC
Rodondo Island	Nature Reserve	TAS
Royal	National Park	NSW
Roydon Island	Conservation Area	TAS
Salt Lake - Backwater Morass G.L.R.	Natural Features Reserve	VIC

Protected Area Name	Reserve Type	State
Sandpatch	Wilderness Zone	VIC
Scamander	Conservation Area	TAS
Seal Creek	Reference Area	VIC
Seal Islands W.R.	Nature Conservation Reserve	VIC
Sellars Lagoon	Game Reserve	TAS
Sentinel Island	Conservation Area	TAS
Settlement Point	Conservation Area	TAS
Seven Mile Beach	National Park	NSW
Shag Lagoon	Conservation Area	TAS
Shiprock	Aquatic Reserve	NSW
Sister Islands	Conservation Area	TAS
Snowy River	Heritage River	VIC
South East Forest	National Park	NSW
Southern Wilsons Promontory	Remote and Natural Area - Schedule 6, National Parks Act	VIC
South Pats River	Conservation Area	TAS
Spike Island	Conservation Area	TAS
Steel Bay - Newland Backwater G.L.R.	Natural Features Reserve	VIC
St Helens	Conservation Covenant	TAS
St Helens	Conservation Area	TAS
St Helens 1 Marthavale	Conservation Covenant	TAS
Storehouse Island	Conservation Area	TAS
Strzelecki	National Park	TAS
Sugarloaf Rock	Conservation Area	TAS
Summer Camp	Conservation Area	TAS
Sydney Cove	Historic Site	TAS

Protected Area Name	Reserve Type	State
Sydney Harbour	National Park	NSW
Tanja	Flora Reserve	NSW
Tarra Tarra B.R	Natural Features Reserve	VIC
The Dock	Conservation Covenant	TAS
The Dutchman	Conservation Area	TAS
The Lakes	National Park	VIC
Tollgate Islands	Nature Reserve	NSW
Towra Point	Nature Reserve	NSW
Towra Point	Aquatic Reserve	NSW
Trefula	Conservation Covenant	TAS
Trousers Point Beach	Conservation Area	TAS
Unnamed (Badger Corner)	Conservation Area	TAS
Unnamed P0155	Private Nature Reserve	VIC
Vansittart Island	Conservation Area	TAS
Vereker Creek	Reference Area	VIC
Waterhouse Island	Conservation Area	TAS
West Moncoeur Island	Nature Reserve	TAS
White Beach	Conservation Area	TAS
William Hunter F.R	Nature Conservation Reserve	VIC
Wilsons Promontory	National Park	VIC
Wilsons Promontory	Wilderness Zone	VIC
Wilsons Promontory	Marine National Park	VIC
Wilsons Promontory Islands	Remote and Natural Area - Schedule 6, National Parks Act	VIC
Wilsons Promontory Marine Park	National Parks Act Schedule 4 park or reserve	VIC

Protected Area Name	Reserve Type	State
Wilsons Promontory Marine Reserve	National Parks Act Schedule 4 park or reserve	VIC
Wingaroo	Nature Reserve	TAS
Wolli Creek	Regional Park	NSW
Wright Rock	Nature Reserve	TAS
Wybalenna Island	Conservation Area	TAS
Youngs Creek	Conservation Area	TAS

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State
East Gippsland	Victoria
Eden	New South Wales
Gippsland	Victoria
Southern NSW	New South Wales
Tasmanian	Tasmania

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
Albion Park Quarry Extraction Area Stage 7 Extension	2020/8871		Post-Approval
Albion Park Rail Bypass, NSW	2017/7909		Post-Approval
Aurora Green Offshore Wind Farm Preliminary Surveys	2024/09968		Completed
Bermagui Golf Club Proposed Subdivision (Stages 3-8)	2022/09242		Post-Approval
Blue Mackerel North Offshore Wind Farm Marine Surveys	2024/09934		Completed
Blue Marlin Offshore Wind Energy Project	2023/09532		Completed
Broulee Beach Estate residential development subdivision	2023/09551		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Circular Quay Renewal	2023/09727		Assessment
Darlington Wastewater Treatment Plant, Service Infrastructure and Water Supply Upgrade	2023/09596		Referral Decision
Development of a Residential Care Facility, Middle Head, NSW	2014/7194		Post-Approval
Dunmore Hard Rock Quarry Modification 13	2022/09319		Post-Approval
Dunmore Lakes Sand Project Modification 2 Pond 5B extraction	2023/09552		Completed
Eastern Rise Offshore Wind Project	2023/09544		Assessment
Eastern Rise Offshore Wind Project Initial Marine Field Investigations	2023/09555		Completed
Eurobodalla Regional Hospital	2023/09506		Completed
Gippsland Dawn Offshore Wind Project Geophysical and Geotechnical Investigations	2024/10030		Referral Decision
Gippsland Offshore Wind Farm Marine Survey Investigations	2023/09682		Completed
Gippsland Offshore Wind Transmission 2GW Project	2024/09980		Assessment
Gippsland Regional Port Project	2020/8667		Completed
Gippsland Skies Offshore Wind Project marine surveys (investigations)	2024/09991		Referral Decision
Golf Course Extension	2001/215		Completed
Greater Gippsland Offshore Wind Project	2022/09379		Assessment
Greater Gippsland Offshore Wind Project Initial Marine Field Investigations	2022/09374		Completed
Greenway Wall - Macquarie Lightstation Conservation	2023/09650		Completed
Hawaiki Nui Submarine Cable - Marine Route Survey and Cable Installation	2024/09814		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Hunter-Central Coast Offshore Energy Initial Marine Field Investigations	2023/09480		Completed
Hunter Central-Coast Offshore Energy Project	2023/09478		Assessment
Kamay Ferry Wharves Project	2020/8825		Post-Approval
Kingsford Defence Land Subdivision and Redevelopment	2002/852		Completed
Krauatungalung Walk	2024/10043		Completed
Mara team testing 26-10-2024 001	2024/10036		Completed
MARA Team Testing - Release 38 - Smoke Test -05 April 2024 - To Be Deleted	2024/09849		Post-Approval
MARA Team Testing - Release 39 - 29 April 2024 - To Be Deleted	2024/09866		Approval
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia East	2024/09795		Completed
Mirador Residential Development Stages 8 & 9 and 13	2023/09685		Assessment
Navigator North Offshore Wind Farm ? Early Marine Survey Investigations	2024/10093		Referral Decision
North East Wind - construction and operation of wind turbines and associated infrastructure	2022/09388		Assessment
PEP11 Site Survey	2009/5093		Completed
Preliminary Site Investigations for Great Eastern Offshore Wind Project	2024/09890		Referral Decision
Princes Highway upgrade program - Milton Ulladulla bypass	2024/10023		Assessment
Project 2 Witchcliffe - proposed vineyard & dam	2005/2263		Completed
Proposed residential subdivision	2023/09632		Completed
Reserve Bank Head Office Building Asbestos Remediation and Refurbishment	2024/10052		Assessment

Title of referral	Reference	Referral Outcome	Assessment Status
Residential development, 11 Jennifer Street, Little Bay, NSW	2018/8170		Completed
Residential Development, Lot 172 DP 755923 and Lot 823 DP 247285, Manyana, NSW	2020/8704		Post-Approval
Residential Development & Associated Works, Jerberra Estate, Tomerong, NSW	2012/6415		Completed
Seadragon Offshore Wind, Early Marine Surveys	2023/09670		Completed
Seadragon Offshore Wind Farm	2022/9163		Completed
Shearwater 2D and 3D marine seismic survey	2005/2180		Completed
SMAP telecommunications submarine cable installation	2024/09989		Completed
Snug Cove Maritime Precinct	2024/09994		Completed
South East Australia Carbon Capture and Storage Project, Commonwealth waters	2023/09732		Completed
South East Australia Carbon Capture and Storage Project, Onshore and State waters	2023/09731		Completed
South Pacific Offshore Wind Project	2023/09605		Completed
supersonic missile launch facility	2000/120		Completed
Walking Track connecting Middle Head Rd & Balmoral Park	2002/572		Completed
West Culburra Residential Subdivision	2023/09524		Approval
Controlled action			
Australian Institute of Police Management Facilities Upgrade	2006/2746	Controlled Action	Post-Approval
Construction and operation of the Westconnex New M5, Sydney, NSW	2015/7520	Controlled Action	Post-Approval
Cook Cove Southern Precinct development, Sydney, NSW	2016/7767	Controlled Action	Post-Approval
Cooks Cove Development Project	2006/2685	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Develop an Offshore Tidal Energy Facility	2008/4518	Controlled Action	Completed
Expansion of Port Botany facilities	2002/543	Controlled Action	Post-Approval
Expansion of the NRE No. 1 Colliery Coal Mine in the Southern Coalfield of NSW	2013/6838	Controlled Action	Completed
Extension of Underground Mining Operations at The Bulli Seam Operations	2010/5350	Controlled Action	Post-Approval
Garden Island Hammerhead Crane Proposed Removal, NSW	2012/6430	Controlled Action	Post-Approval
Gippsland Lakes Mosquito Control Aerial /Hovercraft Spraying	2001/491	Controlled Action	Completed
Golden Beach Gas Project	2019/8513	Controlled Action	Post-Approval
Kurnell Sand Extraction and Backfilling Proposal	2002/631	Controlled Action	Completed
Land rehabilitation following clearing	2008/4635	Controlled Action	Post-Approval
Moriah War Memorial College expansion	2002/575	Controlled Action	Post-Approval
Musselroe Wind Farm	2002/683	Controlled Action	Post-Approval
North Manyana Subdivision, NSW	2021/8948	Controlled Action	Further Information Request
Piano Cove Golf Course and Hotel	2020/8808	Controlled Action	Further Information Request
Pilot Offshore Artificial Reefs	2008/4176	Controlled Action	Post-Approval
Relocation of Grey-Headed Flying-Fox Colony	2008/4646	Controlled Action	Post-Approval
Residential Subdivision and Town Centre Development, Vincentia	2006/2927	Controlled Action	Post-Approval
Rezoning of land and associated public works to facilitate residential development	2007/3448	Controlled Action	Completed
Russell Vale Colliery Revised Underground Expansion Project	2020/8702	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Russell Vale Colliery Underground Expansion Project, NSW	2014/7268	Controlled Action	Completed
Sand Reclamation to Towra Beach	2003/1085	Controlled Action	Post-Approval
Southern section of the Bonnie Doon Golf Course, Pagewood, NSW	2015/7479	Controlled Action	Completed
Star of the South Offshore Wind Farm Project	2020/8650	Controlled Action	Guidelines Issued
Sydney Opera House Building Renewal Program, NSW	2016/7825	Controlled Action	Post-Approval
Sydney Opera House Building Renewal Program - Concert Hall and associated works	2017/7955	Controlled Action	Post-Approval
Thomson River Mercury Recovery Project	2010/5734	Controlled Action	Completed
Upgrade of Floodlighting for Night Sports Training	2009/4798	Controlled Action	Completed
Upgrade of surface facilities at NRE No.1 Colliery	2011/5891	Controlled Action	Post-Approval
Yolla Gas Field (TRL1) Development	2001/321	Controlled Action	Post-Approval
Not controlled action			
2004/2005 drilling program for exploration and production (VIC 01-06, 09-11, 16, 18 & 19 and VIC/RL	2003/1282	Not Controlled Action	Completed
2D seismic Survey in VIC/P55, VIC/RL2 and VIC/P41	2004/1876	Not Controlled Action	Completed
55m lattice tower & infrastructure	2003/1159	Not Controlled Action	Completed
Acquistion of 2D seismic data in State Waters adjacent to Ninety Mile Beach-VIC/P39(V)	2004/1889	Not Controlled Action	Completed
Admiralty House, Kirribilli, foreshore works, NSW	2014/7357	Not Controlled Action	Completed
Allmans Levee Track - Maintenance Work	2003/1053	Not Controlled Action	Completed
Angas and Galloway Exploration Wells VIC/P39(v)	2005/2330	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
APX-East sub-sea telecommunications & data cable system	2014/7139	Not Controlled Action	Completed
Australia-USA Southern Cross NEXT fibre optic cable installation	2019/8405	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Development	2011/6052	Not Controlled Action	Completed
Basker-Manta-Gummy Oil Field Development	2007/3402	Not Controlled Action	Completed
Basker-Manta Oil Field Development	2005/2026	Not Controlled Action	Completed
Bass Basin - Pee Jay-1 - Drilling Program	2007/3908	Not Controlled Action	Completed
Batemans Bay Marina Redevelopment	2008/4265	Not Controlled Action	Completed
Beardie-1 Field wildcat oil well	2001/505	Not Controlled Action	Completed
Biodiversity Impacts Audit	2011/6191	Not Controlled Action	Completed
Botany Bay Cable Project	2007/3552	Not Controlled Action	Completed
Botany Rail Duplication	2019/8566	Not Controlled Action	Completed
BP/Mobil Pipeline to Kingsford Smith Airport	2000/104	Not Controlled Action	Completed
Carbon Black Plant Upgrade	2006/2785	Not Controlled Action	Completed
Caswell Street - Moruya East	2020/8781	Not Controlled Action	Completed
Clearance of native vegetation to create fire breaks	2004/1534	Not Controlled Action	Completed
Communications tower extension	2003/1099	Not Controlled Action	Completed
Conservation and Adaptive Use of Quarantine Station	2002/556	Not Controlled Action	Completed
Construction of a high-capacity fibre optic submarine cable	2006/2914	Not Controlled Action	Completed
Construction of an ocean access boat ramp at Bastion Point	2004/1407	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Construction of a temporary film set, Malabar Headlands	2007/3939	Not Controlled Action	Completed
Construction Of Two New Fuel Processing Plants On Existing Site	2003/1243	Not Controlled Action	Completed
Continental slope research/mid-NSW/Commonwealth Waters	2006/3026	Not Controlled Action	Completed
Cunninghame Arm Redevelopment (Stage 3)	2002/618	Not Controlled Action	Completed
Demolition and Removal of Two Naval Cottages	2008/4373	Not Controlled Action	Completed
Demolition of Ablutions Block, Snapper Island, NSW	2018/8303	Not Controlled Action	Completed
Demolition of the existing club house and construction of a new club house	2009/4932	Not Controlled Action	Completed
Development of Kipper gas field within Vic/L3, Vic/L4 Vic/RL2	2005/2484	Not Controlled Action	Completed
Development of Turrum Oil Field and associated infrastructure	2003/1204	Not Controlled Action	Completed
DOFA weed eradication program at Goorooyaroo NSW	2003/1270	Not Controlled Action	Completed
Dredging of Tuross Lake channel and depositon of spoil in lake	2004/1554	Not Controlled Action	Completed
Drilling and side track completion at Baleen gas production well in Production Licence area VIC/L21	2004/1535	Not Controlled Action	Completed
Drilling of 'Culverin' oil exploration well, permit VIC/P56	2005/2279	Not Controlled Action	Completed
Drilling of Scallop-1 Exploration Well	2003/917	Not Controlled Action	Completed
Duke Cogeneration Plant Port Kembla	2001/179	Not Controlled Action	Completed
East Pilchard exploration well	2001/137	Not Controlled Action	Completed
Eden Wind Farm	2011/6037	Not Controlled Action	Completed
Environmental Works	2001/396	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Extension of Hale Street to Foreshore Road and Associated Works	2008/4035	Not Controlled Action	Completed
Extension to Lucas Heights production building	2003/1114	Not Controlled Action	Completed
Ferry Service Infrastructure Development	2001/269	Not Controlled Action	Completed
Fitout works, 4th Floor, Sydney Customs House, 31 Alfred Street	2004/1449	Not Controlled Action	Completed
Fuel Reduction Proposal Redfield Road, East Killara	2003/1238	Not Controlled Action	Completed
Garden Island ADI Warehouse	2000/69	Not Controlled Action	Completed
George Bass Drive Lilli Pilli Road Realignment	2021/8876	Not Controlled Action	Completed
Georges River Program 2	2003/999	Not Controlled Action	Completed
Gippsland Basin Seismic Programme	2004/1866	Not Controlled Action	Completed
Gippsland Lakes Composting Toilet Program	2000/66	Not Controlled Action	Completed
Hayes Hill Ridge Wind Farm	2007/3437	Not Controlled Action	Completed
Hemingway1/Oil Exploration	2001/177	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
Increase of Road Access to 24 Hours a Day 7 Days a Week	2008/4206	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Industrial Subdivision	2004/1859	Not Controlled Action	Completed
Industrial Subdivision, 262-276 Captain Cook Drive	2004/1899	Not Controlled Action	Completed
Installation of optic fibre cable from Inverloch, Victoria to Stanley, Tasmania	2002/906	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Installation of Sydney-Guam Submarine Cable	2007/3848	Not Controlled Action	Completed
Installation of viewing platform	2005/2138	Not Controlled Action	Completed
Internal Modifications to Reserve Bank of Australia	2008/4431	Not Controlled Action	Completed
Japan-Guam-Australia Sunshine Coast Branch Marine Cable Route Survey (JGA) QLD	2018/8373	Not Controlled Action	Completed
Kipper Tuna Turrum Project Maintenance Dredging	2010/5430	Not Controlled Action	Completed
Lake Illawarra entrance works, Stage 2	2004/1696	Not Controlled Action	Completed
Little Bay Residential Subdivision	2002/873	Not Controlled Action	Completed
Longtom-3 Gas Appraisal Well, VIC/P54	2005/2494	Not Controlled Action	Completed
Longtom Gas Pipeline Development, VIC/P54	2006/3072	Not Controlled Action	Completed
Lot 2 Foreshore Drive, in-filling pit, Port Kembla, NSW	2018/8374	Not Controlled Action	Completed
Marlin-Snapper Gas Pipeline Project	2006/3197	Not Controlled Action	Completed
Melville 1 Oil Exploration Well	2001/167	Not Controlled Action	Completed
Metropolitan coal project - continutaion, upgrade and extension of underground m	2008/4519	Not Controlled Action	Completed
Milton/Ulladulla Sewerage Scheme	2001/251	Not Controlled Action	Completed
Northright-1 Exploration Well	2001/209	Not Controlled Action	Completed
Noxious weed removal, Anzac Rifle Range	2002/761	Not Controlled Action	Completed
Noxious weed removal and controlled burn	2003/1272	Not Controlled Action	Completed
Noxious Weed Removal at Anzac Rifle Range	2004/1336	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Offshore Petroleum Exploration	2001/289	Not Controlled Action	Completed
Offshore Seismic Survey	2001/498	Not Controlled Action	Completed
Princes Highway Upgrade, NSW	2013/6968	Not Controlled Action	Completed
Pump station upgrades and rising main construction, Lakes Entrance, Victoria	2016/7646	Not Controlled Action	Completed
Rabbit Control Anzac Rifle Range	2005/1940	Not Controlled Action	Completed
RBA HOWP 65 Martin Place, NSW	2020/8870	Not Controlled Action	Completed
Redevelopment 60 Martin Place, Sydney, NSW	2015/7490	Not Controlled Action	Completed
Redevelopment of the Cronulla Sharks Leagues Club	2011/5889	Not Controlled Action	Completed
Redevelopment of the former Prince Henry Hospital Site	2003/1048	Not Controlled Action	Completed
Rehabilitation works of the Coogee Sewer Diversion Submain - Maxwell Avenue, Mar	2004/1683	Not Controlled Action	Completed
Remediation of contaminated soil around the Macquarie Lighthouse	2004/1836	Not Controlled Action	Completed
Rubbish removal, Anzac Rifle Range	2002/760	Not Controlled Action	Completed
Sale of New South Head Road, Edgecliff	2001/302	Not Controlled Action	Completed
Sandon Point Residential Development	2001/458	Not Controlled Action	Completed
sewage treatmemt plant process and reliability renewals project	2005/2186	Not Controlled Action	Completed
Shellcove Boatharbour Marine, Commercial & Residential Development	2007/3935	Not Controlled Action	Completed
Shipment of Spent Nuclear Fuel to USA	2007/3672	Not Controlled Action	Completed
Ship to ship crude oil lightering	2008/4279	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Ship to Ship Crude Oil Lightering	2001/271	Not Controlled Action	Completed
Sole-2 appraisal gas well, VIC/RL3	2002/636	Not Controlled Action	Completed
Sole gas field development	2003/937	Not Controlled Action	Completed
Spikey Beach 1, West Triton Drilling Program, Bass Basin Permit T/38P	2007/3914	Not Controlled Action	Completed
Subdivision and sale of Commonwealth land in Pymble to Ku-ring-gai City Council	2004/1368	Not Controlled Action	Completed
Subdivision of 68 ha into two blocks, construction of access road and house site	2004/1531	Not Controlled Action	Completed
Subdivision of Precincts 3 and 12, St Patricks Estate	2004/1925	Not Controlled Action	Completed
Supply of a gigabit ethernet connection with associated trenching, boring and ha	2007/3637	Not Controlled Action	Completed
Sydney Desalination Plant	2005/2331	Not Controlled Action	Completed
Sydney Metro Network Stage 2	2010/5307	Not Controlled Action	Completed
Sydney Primary Loop Gas Pipeline	2006/2622	Not Controlled Action	Completed
Taleb Property Pty Ltd, Tempe Tyres Warehouse project, Captain Cook Drive, Kurnell	2017/8068	Not Controlled Action	Completed
Tallawarra Lands: Urban Development	2011/6002	Not Controlled Action	Completed
The 3000 Acres, clearing and development of native vegetation	2006/3199	Not Controlled Action	Completed
Torpedo Factory Renewal Project	2020/8847	Not Controlled Action	Completed
Translocation of DFTD-free Tasmanian Devils	2011/6216	Not Controlled Action	Completed
Turrum Phase 2 Development Project	2008/4191	Not Controlled Action	Completed
Undertake a controlled burn of the Eastern Suburbs Banksia Scrub at	2004/1728	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Byrne Cresce			
Undertaking of fire protection measures for the bushland regeneration of the Ranwick Environmental P	2003/959	Not Controlled Action	Completed
Upgrade of Captain Cook Drive	2012/6286	Not Controlled Action	Completed
Valentine Substation	2005/1961	Not Controlled Action	Completed
wastewater collection systems and pumping stations	2001/511	Not Controlled Action	Completed
West Triton Drilling Program - Gippsland Basin	2007/3915	Not Controlled Action	Completed
Wreck Bay Housing Development	2001/299	Not Controlled Action	Completed
Not controlled action (particular manner)			
2D & 3D seismic survey T/39P	2005/2237	Not Controlled Action (Particular Manner)	Post-Approval
2D marine seismic survey in PEP-11 permit area, NSW	2002/879	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Aquisition Survey	2008/4041	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/4066	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2008/4131	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey in the Sole gas field and adjacent acreage in the Gippsland Basin (VIC RL/3 & VIC/	2002/871	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey Permit Area VIC/P49	2006/2943	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Seismic Survey Program in Bass Strait	2008/4040	Not Controlled Action (Particular Manner)	Post-Approval
3D Seismic Survey	2008/4528	Not Controlled Action (Particular Manner)	Post-Approval
Apache 3D seismic exploration survey	2006/3146	Not Controlled Action (Particular Manner)	Post-Approval
Aroo Chappell 3D seismic survey	2010/5701	Not Controlled Action (Particular Manner)	Post-Approval
Bass Basin 2D and 3D seismic surveys (T/38P & T/37P)	2007/3650	Not Controlled Action (Particular Manner)	Post-Approval
Bream 3D seismic survey	2006/2556	Not Controlled Action (Particular Manner)	Post-Approval
Bushland Path Through Malabar Headland West	2007/3790	Not Controlled Action (Particular Manner)	Post-Approval
Church and School Development	2006/3185	Not Controlled Action (Particular Manner)	Post-Approval
Construction and operation of a subsea telecommunications cable, between Sydney and New Zealand	2015/7480	Not Controlled Action (Particular Manner)	Post-Approval
Construction of wharf	2003/1050	Not Controlled Action (Particular Manner)	Post-Approval
Construction works on SE corner of the grounds of Admiralty House	2012/6278	Not Controlled Action (Particular Manner)	Post-Approval
Dalrymple 3D Seismic Survey	2010/5680	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Development of Commercial Shellfish Aquaculture Leases within Jervis Bay	2013/6768	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf extension, NSW	2015/7582	Not Controlled Action (Particular Manner)	Post-Approval
Eden Breakwater Wharf Extension, NSW	2016/7828	Not Controlled Action (Particular Manner)	Completed
Exploration drilling of the Craigow-1 and Tolpuddle-1 wells	2010/5725	Not Controlled Action (Particular Manner)	Post-Approval
Gas Pipeline	2000/20	Not Controlled Action (Particular Manner)	Post-Approval
Gippsland 2D Marine Seismic Survey - VIC/P-63, VIC/P-64 and T/46P	2009/5241	Not Controlled Action (Particular Manner)	Post-Approval
Golden Beach gas field development	2003/1031	Not Controlled Action (Particular Manner)	Post-Approval
Hawaiki Fibre-Optic Submarine Cable installation	2016/7765	Not Controlled Action (Particular Manner)	Post-Approval
Hyde Park Barracks Proposed New Passenger Lift	2017/7933	Not Controlled Action (Particular Manner)	Post-Approval
Illawarra coal seam gas exploration drilling and gas monitoring program	2011/5821	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Inspection of project vessels for presence of invasive marine pests in Commonwealth waters off Victo	2012/6362	Not Controlled Action (Particular Manner)	Post-Approval
International fibre optic submarine cable installation, between Sydney and Honiara, Solomon Islands	2015/7502	Not Controlled Action (Particular Manner)	Post-Approval
Japan-Guam-Australia (JGA) Fibre Optic Cable project	2016/7795	Not Controlled Action (Particular Manner)	Post-Approval
Kiama Post Office alterations	2006/2940	Not Controlled Action (Particular Manner)	Post-Approval
Labatt 3D Seismic Survey T/47P Bass Strait	2007/3759	Not Controlled Action (Particular Manner)	Post-Approval
Lake Illawarra Entrance Works (stage 2)	2005/1997	Not Controlled Action (Particular Manner)	Post-Approval
Lakes Entrance Sand Management Program Trial Dredging	2007/3852	Not Controlled Action (Particular Manner)	Post-Approval
Lakes Entrance Sand Management Program Trial Dredging	2007/3694	Not Controlled Action (Particular Manner)	Completed
Longtom-5 Offshore Production Drilling (Vic/L29), VIC	2012/6498	Not Controlled Action (Particular Manner)	Post-Approval
Longtom South -1 Exploration Drilling	2011/6217	Not Controlled Action (Particular Manner)	Post-Approval
Maintenance Dredging of Oceanic Sand	2011/5932	Not Controlled Action (Particular Manner)	Post-Approval
Moriah Primary School, Centennial Park, Sydney	2004/1676	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
NBN Transit Fibre Minnamurra Wetlands Section	2011/5900	Not Controlled Action (Particular Manner)	Post-Approval
Non-exclusive 3-D Marine Seismic Survey, Bass Strait	2002/775	Not Controlled Action (Particular Manner)	Post-Approval
Northern Fields 3D Seismic Survey	2001/140	Not Controlled Action (Particular Manner)	Post-Approval
Pelican 3D Marine Seismic Survey, Gippsland Basin, Vic	2017/8097	Not Controlled Action (Particular Manner)	Post-Approval
Residential Building	2003/935	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Exploration in Permit VIC/P41	2001/267	Not Controlled Action (Particular Manner)	Post-Approval
Seismic Survey	2001/206	Not Controlled Action (Particular Manner)	Post-Approval
Seismic survey, Gippsland Basin	2001/525	Not Controlled Action (Particular Manner)	Post-Approval
Soil and Organic Recycling Facility	2005/2216	Not Controlled Action (Particular Manner)	Post-Approval
Southern Cross Australia-New Zealand-America marine acoustic survey of the seabed	2017/7863	Not Controlled Action (Particular Manner)	Post-Approval
Southern Flanks 2D Marine Seismic Survey	2010/5288	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Southern Margins 3D Seismic Survey VIC/P55	2007/3780	Not Controlled Action (Particular Manner)	Post-Approval
Tap Oil Ltd Molson 2D Seismic Survey T47P	2008/3967	Not Controlled Action (Particular Manner)	Post-Approval
Tasman Global Access submarine cable marine route survey, Narrabeen, NSW	2015/7442	Not Controlled Action (Particular Manner)	Post-Approval
Transport of intermediate level radioactive waste to Lucas Heights, NSW	2015/7437	Not Controlled Action (Particular Manner)	Post-Approval
Transport of OPAL Spent Fuel to France in 2018 and 2025	2016/7841	Not Controlled Action (Particular Manner)	Post-Approval
Tuskfish 3D Seismic Survey, Bass Strait	2002/864	Not Controlled Action (Particular Manner)	Post-Approval
Waterfront Facility at HMAS Creswell	2002/658	Not Controlled Action (Particular Manner)	Post-Approval
West Seahorse Oil Development Project, Commonwealth waters offshore Victoria	2013/6973	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
All actions taken in response to the current severe bushfires in Victoria.	2009/4787	Referral Decision	Completed
Alterations and Additions	2006/3081	Referral Decision	Completed
Beardie-1 Field wildcat oil well	2001/469	Referral Decision	Completed
Beecroft Weapons Range Visitors Centre	2004/1322	Referral Decision	Completed
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Darymple 3D Seismic Survey, Petroleum Exploration Permit T/41P	2010/5322	Referral Decision	Completed
Demolition and Removal of Five Naval Cottages	2008/4322	Referral Decision	Completed
Demolition of Naval Cottages & Revegetation as Part of SHFT's Headland Park	2005/2128	Referral Decision	Completed
Enlargement of existing farm dam to irrigate a vineyard	2004/1853	Referral Decision	Completed
Holloman 2010 Vic/P60 3D Seismic Acquisition Survey Program	2009/5251	Referral Decision	Completed
Longtom 5 Offshore Production Drilling (VIC/L29)	2012/6404	Referral Decision	Completed
Longtom-5 Offshore Production Drilling (Vic/L29)	2012/6413	Referral Decision	Completed
Mineral Exploration Ringarooma Bay	2012/6508	Referral Decision	Completed
PEP11 Drilling Program	2009/5094	Referral Decision	Completed
Relocation of Grey-Headed Flying-Fox Colony	2008/4568	Referral Decision	Completed
Renovation and Landscape Rehabilitation of the Championship Course at Royal Sydney Golf Club	2022/9167	Referral Decision	Referral Publication
Shark 3D Seismic Survey	2007/3294	Referral Decision	Completed
Stage 2 Masonry Plant, Port Kembla, NSW	2014/7247	Referral Decision	Completed
Stanton 3D Marine Seismic Survey	2013/6764	Referral Decision	Completed
Upgrade of Corringle Road	2009/4825	Referral Decision	Completed

Key Ecological Features [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region

Name	Region
Big Horseshoe Canyon	South-east
Canyons on the eastern continental slope	Temperate east
Seamounts South and east of Tasmania	South-east
Shelf rocky reefs	Temperate east
Tasman Front and eddy field	Temperate east
Tasmantid seamount chain	Temperate east
Upwelling East of Eden	South-east

Biologically Important Areas

[Resource Information]

Scientific Name	Behaviour	Presence
Dolphins		
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur
Tursiops aduncus Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Known to occur
Seabirds		
Ardenna carneipes Flesh-footed Shearwater [82404]	Foraging	Known to occur
Ardenna grisea Sooty Shearwater [82651]	Breeding	Known to occur
Ardenna grisea Sooty Shearwater [82651]	Foraging	Likely to occur
Ardenna grisea Sooty Shearwater [82651]	Foraging	Known to occur
Ardenna pacifica Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging	Likely to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Breeding	Known to occur
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Likely to occur

Scientific Name	Behaviour	Presence
Ardenna tenuirostris Short-tailed Shearwater [82652]	Foraging	Known to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Likely to occur
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Foraging	Known to occur
Diomedea exulans antipodensis Antipodean Albatross [82269]	Foraging	Known to occur
Eudyptula minor Little Penguin [1085]	Breeding	Likely to occur
Eudyptula minor Little Penguin [1085]	Breeding	Known to occur
Eudyptula minor Little Penguin [1085]	Foraging	Known to occur
Macronectes giganteus Southern Giant Petrel [1060]	Foraging	Known to occur
Macronectes halli Northern Giant Petrel [1061]	Foraging	Known to occur
Oceanites oceanites Wilsons Storm Petrel [1034]	Migration	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Breeding	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Breeding	Known to occur
Pelecanoides urinatrix Common Diving-petrel [1018]	Foraging	Known to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Breeding	Known to occur

Scientific Name	Behaviour	Presence
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Likely to occur
Phalacrocorax fuscescens Black-faced Cormorant [59660]	Foraging	Known to occur
Procellaria parkinsoni Black Petrel [1048]	Foraging	Likely to occur
Pterodroma macroptera Great-winged Petrel [1035]	Foraging	Likely to occur
Pterodroma mollis Soft-plumaged Petrel [1036]	Foraging	Known to occur
Sterna striata White-fronted Tern [799]	Breeding	Known to occur
Sterna striata White-fronted Tern [799]	Foraging	Known to occur
Thalassarche bulleri Bullers Albatross [64460]	Foraging	Known to occur
Thalassarche cauta cauta Shy Albatross [82345]	Foraging likely	Likely to occur
Thalassarche cauta steadi White-capped Albatross [82344]	Foraging	Known to occur
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging	Known to occur
Thalassarche melanophris Black-browed Albatross [66472]	Foraging	Known to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Likely to occur
Thalassarche melanophris impavida Campbell Albatross [82449]	Foraging	Known to occur
Thalasseus bergii Crested Tern [83000]	Breeding	Known to occur

Scientific Name	Behaviour	Presence
Thalasseus bergii Crested Tern [83000]	Foraging	Likely to occur
Sharks		
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur
Carcharias taurus Grey Nurse Shark [64469]	Reproduction	Known to occur
Carcharodon carcharias White Shark [64470]	Breeding (nursery area)	Known to occur
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Likely to be present
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur
Eubalaena australis Southern Right Whale [40]	Migration	
Eubalaena australis Southern Right Whale [40]	Reproduction	
Megaptera novaeangliae Humpback Whale [38]	Migration	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	Known to occur

Bioregional Assessments		[Resource Information]
SubRegion	BioRegion	Website
Sydney	Sydney Basin	BA website
Gippsland	Gippsland Basin	BA website

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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APPENDIX C SPILL MODELLING REPORT

EMPEROR ENERGY VIC/P47 OIL SPILL MODELLING

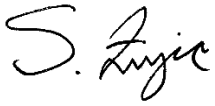
Report

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Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
A	Draft with stochastic results issued for internal review	Dr. Sasha Zigic	Dr. Ryan Dunn		23 November 2022
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Approval for issue

Dr. Sasha Zigic  6 December 2022

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TERMS AND ABBREVIATIONS

Actionable oil	Oil which is thick enough for the effective use of mitigation strategies.
AMSA	Australian Maritime Safety Authority
API	American Petroleum Institute gravity. A measure of how heavy or light a petroleum liquid is compared to water.
Bonn Agreement	An agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances, 1983, includes: Governments of the Kingdom of Belgium, the Kingdom of Denmark, the French Republic, the Federal Republic of Germany, the Republic of Ireland, the Kingdom of the Netherlands, the Kingdom of Norway, the Kingdom of Sweden, the United Kingdom of Great Britain and Northern Ireland and the European Union.
BP	Boiling point. The temperature at which the vapor pressure of the liquid is equal to the pressure exerted on it by the surrounding atmosphere.
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
Decay	The process where oil components are changed either chemically or biologically (biodegradation) to another compound. It includes breakdown to simpler organic carbon compounds by bacteria and other organisms, photo-oxidation by solar energy, and other chemical reactions.
Deterministic (single) Oil spill modelling	Oil spill modelling involving a computer simulation of a single hypothetical oil spill event subject to a single sequence of wind, current and other sea conditions over time. Single oil spill modelling, also referred to as “deterministic modelling” provides a simulation of one possible outcome of a given spill scenario, subject to the metocean conditions that are imposed. Single oil spill modelling is commonly used to consider the fate and effects of ‘worst-case’ oil spill scenarios that are carefully selected in consideration of the nature and scale of the offshore petroleum activity and the local environment (NOPSEMA, 2017). Because the outcomes of a single oil spill simulation can only represent the outcome of that scenario under one sequence of metocean conditions, worst-case conditions are often identified from stochastic modelling. It is impossible to calculate the likelihood of any outcome from a single oil spill simulation. Single oil spill modelling is generally used for response planning, preparedness planning and for supporting oil spill response operations in the event of an actual spill.
Dynamic viscosity	The dynamic viscosity of a fluid expresses its resistance to shearing flows, where adjacent layers move parallel to each other with different speeds.
Floating oil exposure	Contact by floating oil on the sea surface at concentrations equal to or exceeding defined threshold concentrations. The consequence will vary depending on the threshold and the receptors.
HYCOM	Hybrid Coordinate Ocean Model. A data-assimilative, three-dimensional ocean model
HYDROMAP	Advanced ocean/coastal tidal model used to predict tidal water levels, current speed and current direction.
MAHs	Monoaromatic Hydrocarbons
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
PAH	Polynuclear Aromatic Hydrocarbons
Pour Point	The pour point of a liquid is the temperature below which the liquid loses its flow characteristics.
Shoreline accumulation	Arrival of oil at or near shorelines at on-water concentrations equal to or exceeding defined threshold concentrations. Shoreline accumulation is judged for floating oil arriving within a 2 km buffer zone from any shoreline as a conservative measure.
SIMAP	Spill Impact Model Application Package. SIMAP is designed to simulate the fate and effects of spilled hydrocarbons for surface or subsea releases.
Stochastic (multiple) oil spill modelling	Stochastic oil spill modelling is created by overlaying and statistically analysing the outcomes of many single oil-spill simulations of a defined spill scenario, where each simulation was subject to a different sequence of metocean conditions, selected objectively (typically by random selection) from a long sequence of historic conditions for the study area. Analysis of this larger set of simulations provides a more accurate indication of the areas of potential exposure and indicates

	which locations are more likely to be exposed (as well as other statistics). Stochastic oil spill modelling avoids biases that affect single oil spill modelling (due to the reliance on only one possible sequence of conditions). However, when interpreting stochastic modelling, which is based on a wide range of potential conditions that might happen to occur, it is essential to understand that calculations will encompass a much larger area than could be affected in any single spill event, where a more limited set of conditions will occur. Consequently, it is misleading to imply that the region derived from stochastic modelling indicate the outcomes expected from a single spill event (NOPSEMA, 2017) Stochastic modelling is generally used for risk assessment and preparedness planning by indicating locations that could be exposed and may require response or subsequent impact assessment.
WGS 1984	World Geodetic System 1984 (WGS84); reference coordinate system

EXECUTIVE SUMMARY

Background

Emperor Energy Limited (Emperor Energy) plans to drill the Judith-2 exploration well in Permit VIC/P47 in the Gippsland Basin, approximately 200 km east of Melbourne. To support the preparation of the Environment Plan (EP) and Oil Pollution Emergency Plan (OPEP), a detailed oil spill modelling study was commissioned to assess the potential exposure for the following scenarios:

- Scenario 1 – A 280 m^3 release of Marine Diesel Oil (MDO) over 6 hours from a loss of containment following a vessel collision; and
- Scenario 2 – An uncontrolled subsea loss of well control (LOWC) releasing a total of 347,584 bbl (or 55,256 m^3) of condensate depleting over 77 days (average daily rate of 4,514 bbl/day or 717 m^3/day).

The potential exposure to the surrounding waters and shorelines were assessed for summer (October to March) and winter (April to September) seasons.

The modelling does not take into consideration any of the spill prevention, mitigation and response capabilities that would be implemented in response to the spill.

Methodology

The modelling study was carried out in stages. Firstly, a 10-year wind and current dataset (2010–2019) that includes the combined influence of large-scale ocean and tidal currents was prepared. Secondly, the currents, winds and detailed oil characteristics were used as inputs in the three-dimensional trajectory and fates model; Spill Impact Model Application Package (SIMAP). The SIMAP model calculates the transport, spreading, entrainment and evaporation of spilled hydrocarbons over time, based on the prevailing wind and current conditions and the physical and chemical properties.

Modelling was conducted using a stochastic (or probabilistic) approach, which involved running 100 spill simulations per season (and scenario), with each simulation having the same spill information (volume, duration and oil properties) but randomly selected start time to ensure a range of wind and current conditions were assessed. Once all 100 simulations were run for each season, the results were combined to determine the seasonal exposure to the surrounding waters, shorelines and sensitive receptors based on the thresholds outlined in the NOPSEMA Oil Spill Modelling Bulletin (NOPSEMA 2019).

Oil Characteristics

The MDO for this study has a density of 829.1 kg/m^3 (API gravity of 37.6) and a dynamic viscosity of 4.0 cP at 25ºC. MDO is characterised by a high percentage of volatile components (95%), which will evaporate when on the sea surface. It also contains 5% persistent hydrocarbons, which will not evaporate, though will decay over time. It is classified as a Group II light persistent oil.

Reservoir modelling had indicated that the condensate is likely to have an API of 54.6, which is equivalent to a density of 760 kg/m^3. The chosen proxy has a low viscosity of 0.875 cP and the volatile to semi-volatile components (boiling point (BP) < 265 °C) represent approximately 83% of the whole condensate which is likely to evaporate over the first few days if exposed to the atmosphere at local temperatures, leaving the low volatile portion (16%) to progressively evaporate more slowly over a longer period. Only 1% of the condensate is considered persistent and will decay over time. It is classified as a Group I non persistent oil.

When exposed to the atmosphere, approximately 64% of the condensate should evaporate within the first 12 – 24 hours (boiling point (BP) < 180 °C). A further 19% of the semi-volatiles should evaporate within the first 24-72 hours (180°C < BP < 265°C); and low volatile portion (16%) should evaporate over a longer period (265°C < BP < 380°C). Only 1% of the condensate is considered persistent and will decay over time. It is classified as a Group I non persistent oil.

It is important to note that some of the low volatile and persistent components contained the condensate and MDO will have a strong tendency to physically entrain into the upper water column in the presence of moderate winds (i.e. >12 knots) and breaking waves but can re-float to the surface if these energies abate.

Summary of Modelling Results

Scenario 1: Vessel Collision

- Floating oil concentrations exceeding 1 g/m^2 could extend up to 167.3 km from the release location due to a small, isolated patch which had resurfaced near the New South Wales (NSW) boarder during a simulation under summer conditions. The distance reduces to 18.7 km as the threshold increases to 10 g/m^2 and down to 2.9 km as the threshold increases further to 50 g/m^2.
- There was no floating oil exposure predicted for any receptor at any threshold.
- No shoreline accumulation was predicted for the 100 g/m^2 and 1,000 g/m^2 thresholds.
- The highest probability of oil accumulation at the 10 g/m^2 threshold was during winter at 12% and the minimum time before oil had reached the shorelines was 3.6 days. The maximum volume ashore during a simulation was 9.1 m^3.
- The highest probability of oil accumulation at the 10 g/m^2 threshold was forecast for the East Gippsland shoreline (7% during summer and winter conditions). The same shoreline sector recorded the quickest time before oil accumulation at 3.25 days under summer conditions.
- Dissolved hydrocarbon concentrations exceeding 10 ppb may potentially occur 177.4 km from the release location with the distance reducing to 3.1 km as the exposure threshold increases to 50 ppb for winter conditions only. The concentrations did not exceed 400 ppb. Based on the 10 ppb threshold, during summer a 1% probability of exposure was predicted for Victorian State waters. For winter conditions, a 1% probability of exposure was forecast for New Zealand Star Bank and New South Wales State waters, which had occurred after 2.50 days and 2.63 days, respectively.
- Entrained hydrocarbon concentrations exceeding 10 ppb may potentially occur up to 610.9 km from the release location, with the distance reducing to 221.2 km as the threshold increases to 100 ppb.
- Probabilities of entrained hydrocarbon exposure to receptors for concentrations equal to or greater than 10 ppb was predicted to be greatest at the New Zealand Star Bank (26% for summer and 39% for winter conditions). The highest concentration was predicted at the Big Horseshoe Canyon Key Ecological Feature (KEF) at 496 ppb during winter.

Scenario 2: Subsea LOWC

- In the event of a LOWC, the amalgamated gas and condensate would propel rapidly upward from the seabed and rupture the sea surface, hence, condensate would be present in the surface waters (0 – 5 m depth).
- Floating oil concentrations ≥1 g/m^2 could extend up to 202.2 km from the release location. The distance reduces to 18.3 km as the threshold increases to 10 g/m^2 and 0.4 km as the threshold further increases to the 50 g/m^2, during winter conditions only.
- Probabilities of floating oil exposure to receptors at concentrations ≥1 g/m^2 were highest for Victorian State waters for summer (9%) and winter (23%). The exposure was predicted to occur after 3.42 days after the commencement of the spill. There was no predicted exposure to any of the receptors as the threshold increases to 10 g/m^2.
- The highest probability of accumulation on shorelines at the 10 g/m^2 threshold was during winter (98%) and the minimum time before shoreline accumulation of condensate was 2.92 days. The maximum volume of oil ashore was forecast for the East Gippsland shorelines at 17.1 m^3 and 28.1 m^3 during summer and winter conditions, respectively.

- Dissolved hydrocarbon concentrations exceeding 10 ppb may potentially occur 1,039.1 km from the release location with the distance reducing to 898.8 km and 186.7 km as the exposure threshold increases to 50 ppb and 400 ppb, respectively.
- The probability of dissolved hydrocarbon exposure to receptors for concentrations at or above 10 ppb was highest at the New Zealand Star Bank (100% during summer and winter conditions), while the highest concentration was predicted at Cape Howe Marine National Park (MNP) at 394 ppb during winter conditions.
- Entrained hydrocarbon concentrations exceeding 10 ppb may potentially occur 917.2 km from the release location, with the distance reducing to 578.3 km as the threshold increases to 100 ppb.
- New Zealand Star Bank and Victorian State waters recorded probabilities of 100% for entrained hydrocarbon exposure at or above 10 ppb for both summer and winter conditions. New Zealand Star Bank recorded the highest probability of exposure for concentrations exceeding 100 ppb at 78% for summer and 72% under winter conditions. The highest concentration of entrained hydrocarbons was predicted at the Big Horseshoe Canyon KEF as 518 ppb.

1 INTRODUCTION

1.1 Background

Emperor Energy Limited (Emperor Energy plans to drill the Judith-2 exploration well in Permit VIC/P47 in the Gippsland Basin, approximately 200 km east of Melbourne. To support the preparation of the Environment Plan (EP) and Oil Pollution Emergency Plan (OPEP), AGR on behalf of EMP had commissioned RPS to undertake a detailed oil spill modelling study to assess the potential exposure for the following scenarios:

- Scenario 1 – A 280 m^3 release of Marine Diesel Oil (MDO) over 6 hours from a loss of containment following a vessel collision; and
- Scenario 2 – An uncontrolled subsea loss of well control (LOWC) releasing a total of 347,584 bbl (or 55,256 m^3) of condensate depleting over 77 days (average daily rate of 4,514 bbl/day or 717 m3/day).

The potential exposure to the surrounding waters and shorelines were assessed for summer (October to March) and winter (April to September) seasons.

The coordinates of the release location are presented in Table 1.1 and is illustrated in Figure 1.1.

The spill modelling was performed using an advanced three-dimensional trajectory and fates model; Spill Impact Model Application Package (SIMAP). The SIMAP model calculates the transport, spreading, entrainment and evaporation of spilled hydrocarbons over time, based on the prevailing wind and current conditions and the physical and chemical properties. The modelling does not take into consideration any of the spill prevention, mitigation and response capabilities that would be implemented in response to the spill.

The hydrocarbon spill model, the method and analysis applied herein uses modelling algorithms which have been peer reviewed and published in international journals. Further, RPS warrants that this work meets and exceeds the American Society for Testing and Materials (ASTM) Standard F2067-13 "*Standard Practice for Development and Use of Oil Spill Models*".

Table 1.1 Coordinates of VIC/P47 oil spill modelling release location.

Latitude*	Longitude*	Water depth (m)
38° 8' 30" S	148° 32' 21" E	70

*Datum: WGS 1984

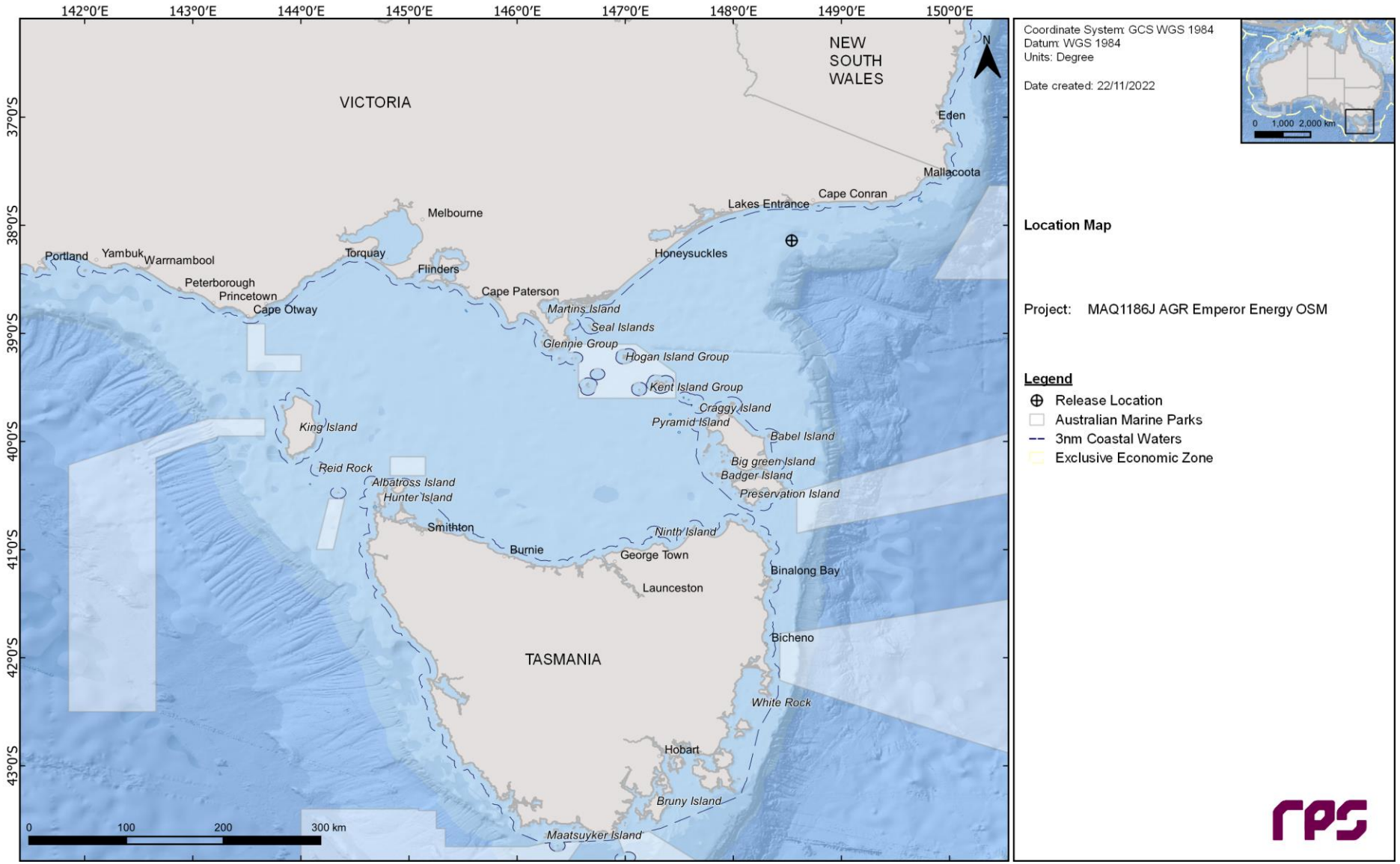


Figure 1.1 VIC/P47 oil spill modelling release location.

What is Oil Spill Modelling?

Oil spill modelling is a valuable tool widely used for risk assessment, emergency response and contingency planning where it can be particularly helpful to proponents and decision makers. By modelling a series of the most likely oil spill scenarios, decisions concerning suitable response measures and strategic locations for deploying equipment and materials can be made, and the locations at most risk can be identified. The two types of oil spill modelling often used are stochastic and deterministic modelling.

In this study, oil spill modelling was undertaken using a three-dimensional oil spill trajectory and weathering model, SIMAP (Spill Impact Model Application Package), which is designed to simulate the transport, spreading and weathering of specific oil types under the influence of changing meteorological and oceanographic forces. For the subsea release near-field subsurface discharge modelling was undertaken using OILMAP, which predicts the centreline velocity, buoyancy, width and trapping depth (if any) of the rising gas and oil plumes.

1.1.1 Stochastic Modelling (Multiple Spill Simulations)

Stochastic oil spill modelling is created by overlaying a great number (often hundreds) of individual, computer-simulated hypothetical spills (NOPSEMA, 2018; Figure 1.2).

Stochastic modelling is a common means of assessing the potential risks from oil spills related to new projects and facilities. Stochastic modelling typically utilises hydrodynamic data for the location in combination with historic wind data. Typically, 100 simulations are run, which sufficiently samples the historic dataset that is most relevant to the season or timing of the project.

The outcomes are often presented as a probability of exposure and is primarily used for risk assessment purposes in view to understand the range of environments that may be affected or impacted by a spill. Elements of the stochastic modelling can also be used in oil spill preparedness and planning.

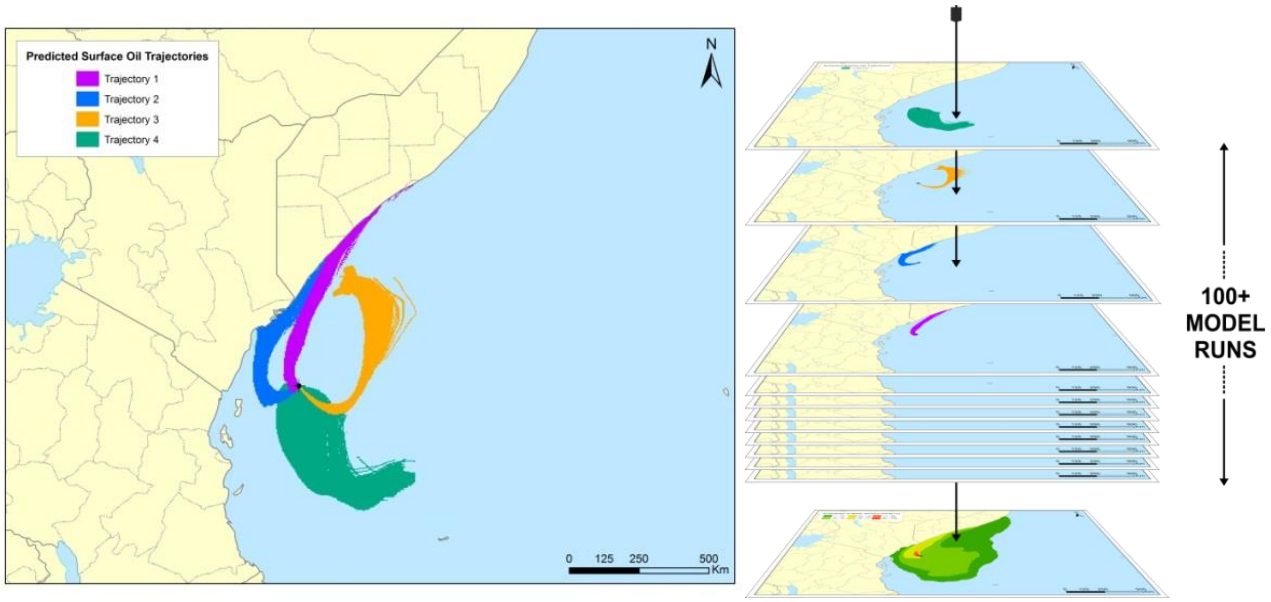


Figure 1.2 Examples of four individual spill trajectories (four replicate simulations) predicted by SIMAP for a spill scenario (left pane). The frequency of contact with given locations is used to calculate the probability of impacts during a spill. Essentially, all model runs are overlain (shown as the stacked runs on the right) and the number of times that trajectories contact a given location at a concentration is used to calculate the probability.

1.1.2 Deterministic Modelling (Single Spill Simulation)

Deterministic modelling is the predictive modelling of a single incident subject to a single sample of wind and weather conditions over time (NOPSEMA, 2018).

Deterministic modelling is often paired with stochastic modelling to place the large stochastic footprint into perspective. This deterministic analysis is generally a single run selected from the stochastic analysis and serves as the basis for developing the spill response or scientific monitoring plans.

2 SCOPE OF WORK

The scope of work included the following components:

- Generate 10 years (2010 to 2019 (inclusive)) of wind and current data. The three-dimensional current data includes the combined influence of ocean and tidal currents;
- Include the wind data, current data and oil properties into the three-dimensional oil spill model; SIMAP, to model the movement, spreading, entrainment, weathering and potential shoreline accumulation over time;
- Run 100 simulations for each season (i.e. 200 simulations total for each scenario), with each simulation having the same spill information (location, volume, duration and oil properties) but randomly varying start times. This ensured that each spill simulation was subjected to unique wind and current conditions;
- Combine the results from the 100 spill simulations (per season and scenario) to determine the potential seasonal exposure to the surrounding waters, shorelines and sensitive receptors based on the thresholds outlined in the NOPSEMA Oil Spill Modelling Bulletin (NOPSEMA 2019);
- Present the combined results from all 200 spill simulations for each scenario, to identify the low, moderate and high exposure areas; and
- From the 200 simulations modelled for each scenario, identify and present the “worst case” deterministic run resulting in the maximum volume of hydrocarbons ashore.

3 REGIONAL CURRENTS

The Gippsland Basin lies within the eastern portion of the Bass Strait, a sea strait separating Tasmania from the southern Australian mainland. The strait is a relatively shallow area of the continental shelf, connecting the southeast Indian Ocean with the Tasman Sea. This region has a reputation for high winds and strong tidal currents (Jones, 1980). Currents are primarily driven by tides, winds and density driven flows. During winter the South Australian current moves dense, salty water eastward from the Great Australian Bight into the western margin of the Bass Strait (Sandery & Kämpf, 2007). In winter and spring, waters within the strait are well mixed with no obvious stratification, while during summer the central regions of the strait become stratified (Baines & Fandry, 1983; Middleton & Black, 1994).

Figure 3.1 displays seasonal current trends within the Gippsland Basin-Bass Strait region. During winter there is a strong eastward water flow due to the strengthening of the South Australian Current (fed by the Leeuwin Current in the Northwest Shelf), which bifurcates with one extension moving though the Bass Strait, and another forming the Zeehan Current off western Tasmania (Sandery & Kämpf, 2007). During summer, water flow reverses off Tasmania, King Island and the Otway Basin travelling eastward, as the coastal current develops due to south-easterly winds.

Therefore, to accurately account for the movement of an oil spill, which can move between the offshore and near shore region, ocean and tidal currents were combined as part of the study. The following sections provide a summary of the regional current data set.

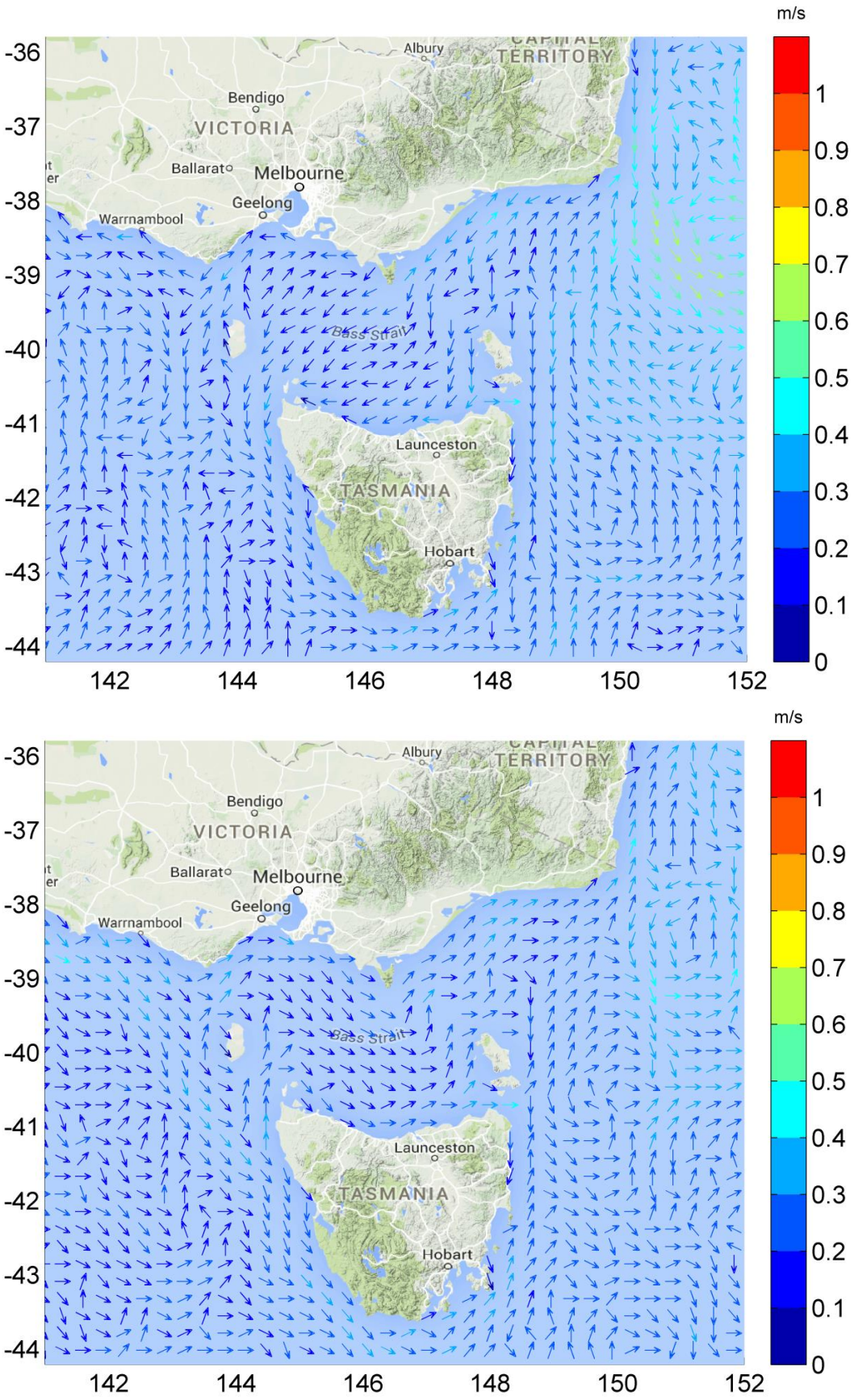


Figure 3.1 HYCOM averaged seasonal surface drift currents during summer (upper image) and winter (lower image).

3.1 Tidal currents

Tidal current data was generated using RPS's advanced ocean/coastal model, HYDROMAP. The HYDROMAP model has been thoroughly tested and verified through field measurements throughout the world for more than 30 years (Isaji & Spaulding, 1984; Isaji, et al., 2001; Zigic, et al., 2003). HYDROMAP tidal current data has been used as input to forecast (in the future) and hindcast (in the past) pollutant spills in Australian waters and forms part of the Australian National Oil Spill Emergency Response System operated by AMSA (Australian Maritime Safety Authority).

HYDROMAP employs a sophisticated sub-gridding strategy, which supports up to six levels of spatial resolution, halving the grid cell size as each level of resolution is employed. The sub-gridding allows for higher resolution of currents within areas of greater bathymetric and coastline complexity, and/or of interest to a study.

The numerical solution methodology follows that of Davies (1977a 1977b) with further developments for model efficiency by Owen (1980) and Gordon (1982). A more detailed presentation of the model can be found in Isaji & Spaulding (1984) and Isaji et al. (2001).

3.1.1 Grid Setup

The tidal model domain has been sub-gridded down to a resolution of 500 m for shallow and coastal regions, starting from an offshore (or deep water) resolution of 8 km. The finer grids were allocated in a step-wise fashion to resolve flows more accurately along the coastline, around islands and over regions with more complex bathymetry. Figure 3.2 shows the tidal model grid covering the study domain.

A combination of datasets was used and merged to describe the shape of the seabed within the grid domain (Figure 3.3). These included spot depths and contours which were digitised from nautical charts released by the hydrographic offices as well as Geoscience Australia database and depths extracted from the Shuttle Radar Topography Mission (SRTM30_PLUS) Plus dataset (see Becker et al., 2009).

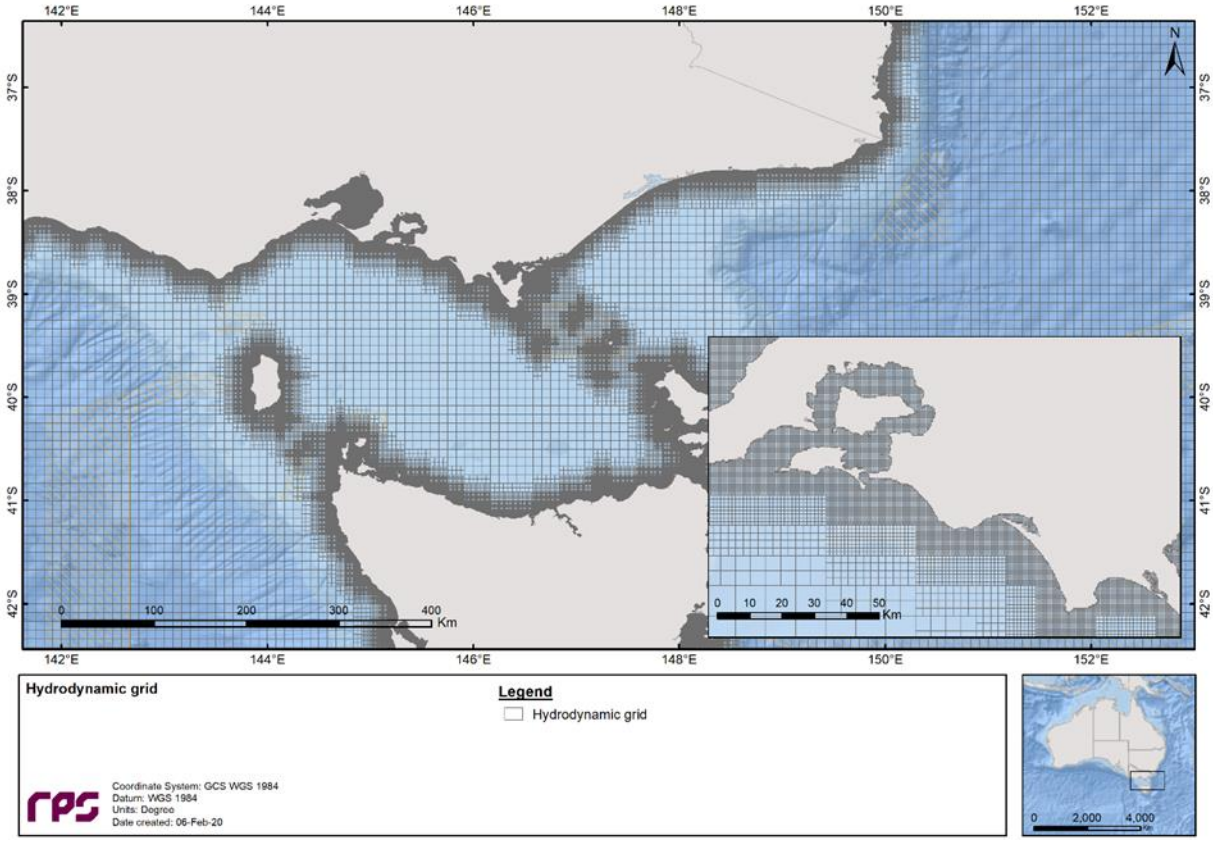


Figure 3.2 Sample of the model grid used to generate the tidal currents for the study region. Higher resolution areas are shown by the denser mesh.

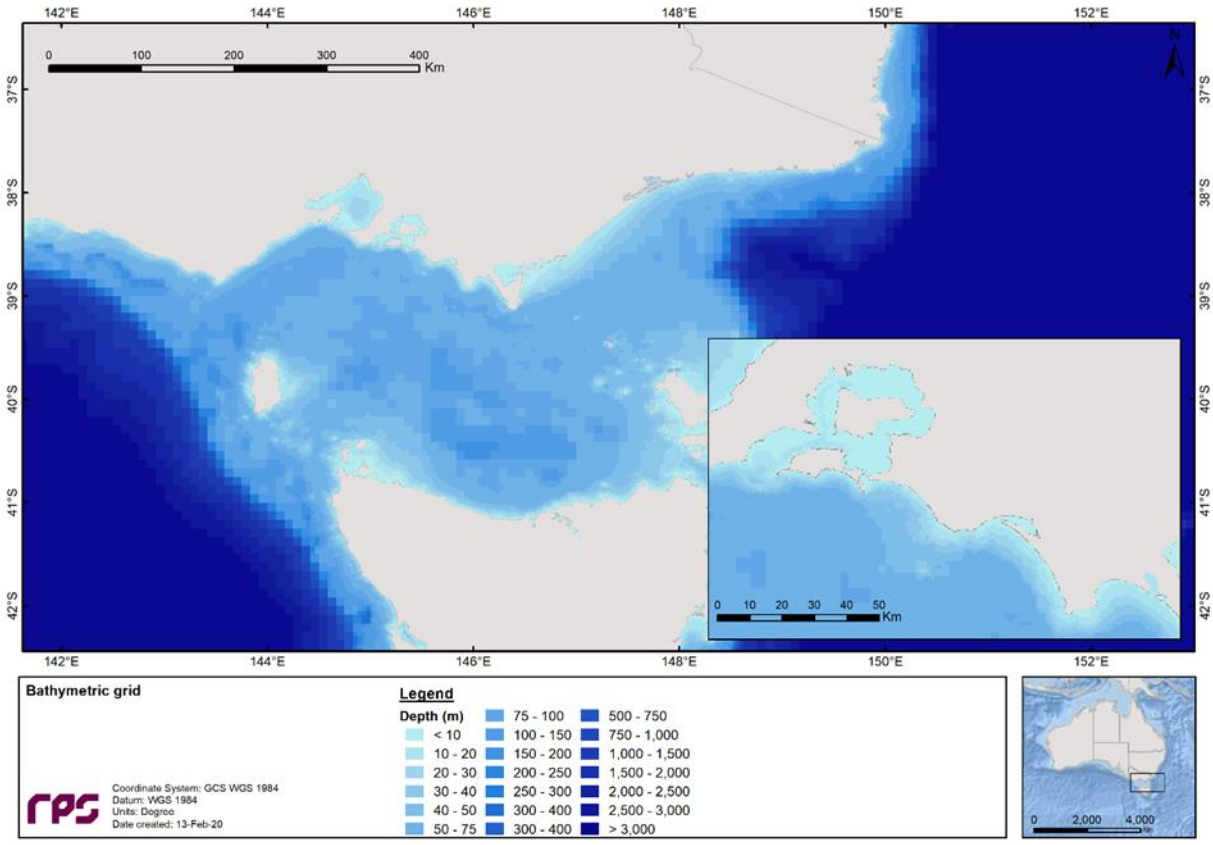


Figure 3.3 Bathymetry defined throughout the tidal model domain.

3.1.2 Tidal Conditions

The ocean boundary data for the regional model was obtained from satellite measured altimetry data (TOPEX/Poseidon 8.0) which provided estimates of the eight dominant tidal constituents at a horizontal scale of approximately 0.25 degrees. The eight major tidal constituents used were K_2, S_2, M_2, N_2, K_1, P_1, O_1 and Q_1. Using the tidal data, time series surface heights were calculated along the open boundaries for the simulation period.

The Topex/Poseidon satellite data has a resolution of 0.25 degrees globally, with higher resolution in coastal regions, and is produced and quality controlled by NASA (National Aeronautics and Space Administration). The data capturing satellites, equipped with two altimeters capable of taking sea level measurements accurate to less than ± 5 cm, measured oceanic surface elevations (and the resultant tides) for the period 1992–2005. In total these satellites carried out 62,000 orbits of the planet. The Topex/Poseidon tidal data has been widely used amongst the oceanographic community, being referenced in more than 2,100 research publications (e.g., Andersen, 1995; Ludicone et al., 1998; Matsumoto et al., 2000; Kostianoy et al., 2003; Yaremchuk & Tangdong, 2004; Qiu & Chen, 2010). The Topex/Poseidon tidal data is considered suitably accurate for this study.

3.2 Ocean Currents

Data describing the flow of ocean currents was obtained from HYCOM (Hybrid Coordinate Ocean Model, (Chassignet et al., 2007), which is operated by the HYCOM Consortium, sponsored by the Global Ocean Data Assimilation Experiment (GODAE). HYCOM is a data-assimilative, three-dimensional ocean model that is run as a hindcast (for a past period), assimilating time-varying observations of sea surface height, sea surface temperature and in-situ temperature and salinity measurements (Chassignet et al., 2009). The HYCOM predictions for drift currents are produced at a horizontal spatial resolution of approximately 8.25 km ($1/12^{th}$ of a degree) over the region, at a frequency of three-times per day. HYCOM uses isopycnal layers in the open, stratified ocean, but uses the layered continuity equation to make a dynamically smooth transition to a terrain-following coordinate in shallow coastal regions, and to z-level coordinates in the mixed layer and/or unstratified seas.

For this study, the HYCOM hindcast ocean currents were obtained for the years 2010 to 2019 (inclusive).

3.3 Surface Currents

The monthly average surface current speeds in the vicinity of the release location ranged between 0.23 m/s (April) and 0.38 m/s (July). Additionally, the monthly maximums ranged between 1.07 m/s (February) and 1.92 m/s (July). The general current directions were predominantly towards the southwest and northeast. Figure 3.4 and Figure 3.5 present the monthly and total current rose distributions, respectively.

Note the convention for defining current direction throughout this report is the direction the current flows towards. Each branch of the current rose distribution represents the currents flowing to that direction, with north to the top of the diagram. The branches are divided into segments of different colour, which represent the current speed ranges for each direction. Speed intervals of 0.1 m/s are typically used in these current roses. The length of each coloured segment within a branch is proportional to the frequency of currents flowing within the corresponding speed and direction.

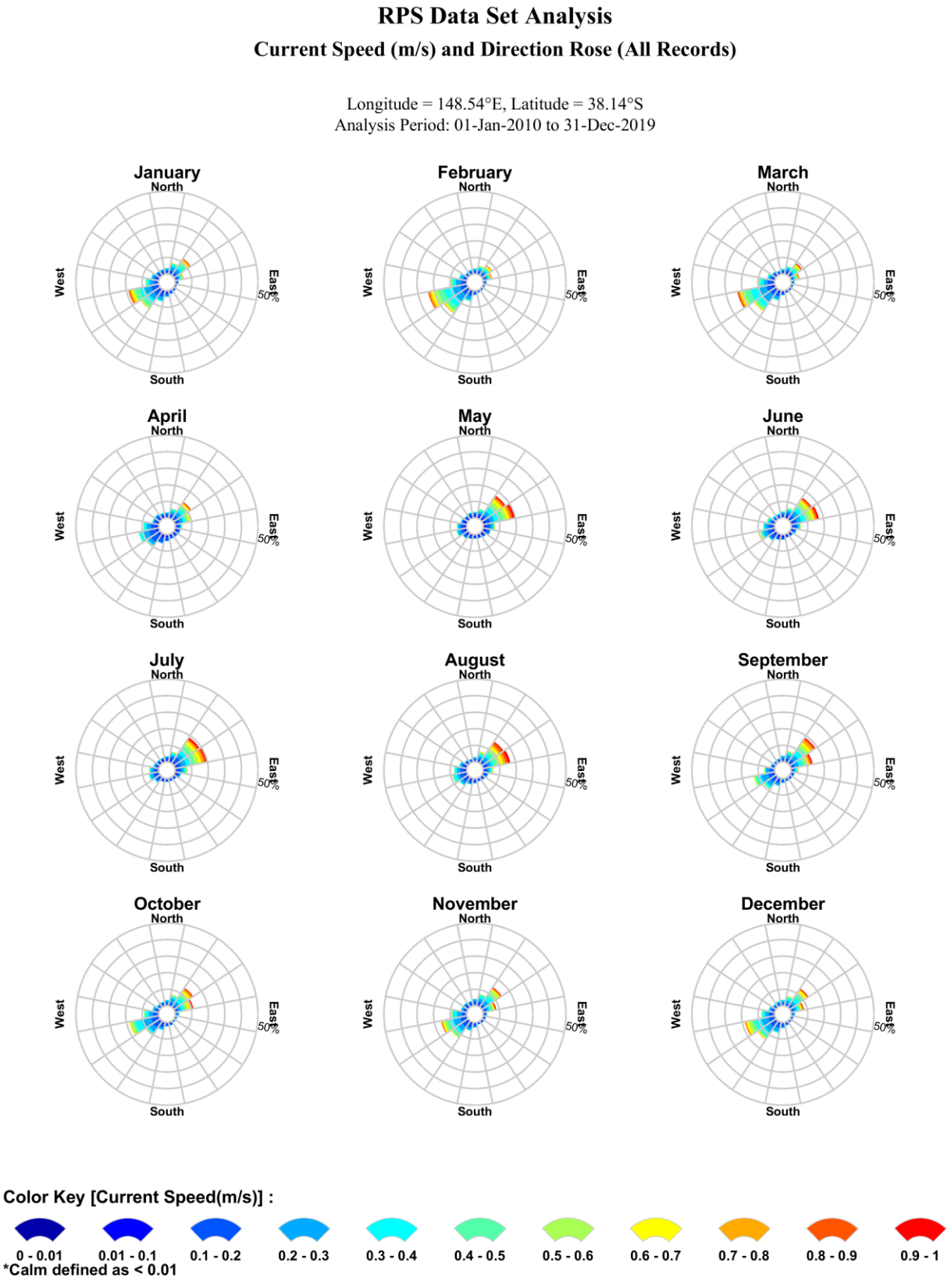


Figure 3.4 Monthly surface current rose distributions at the release location, derived from the 2010 to 2019 modelled dataset.

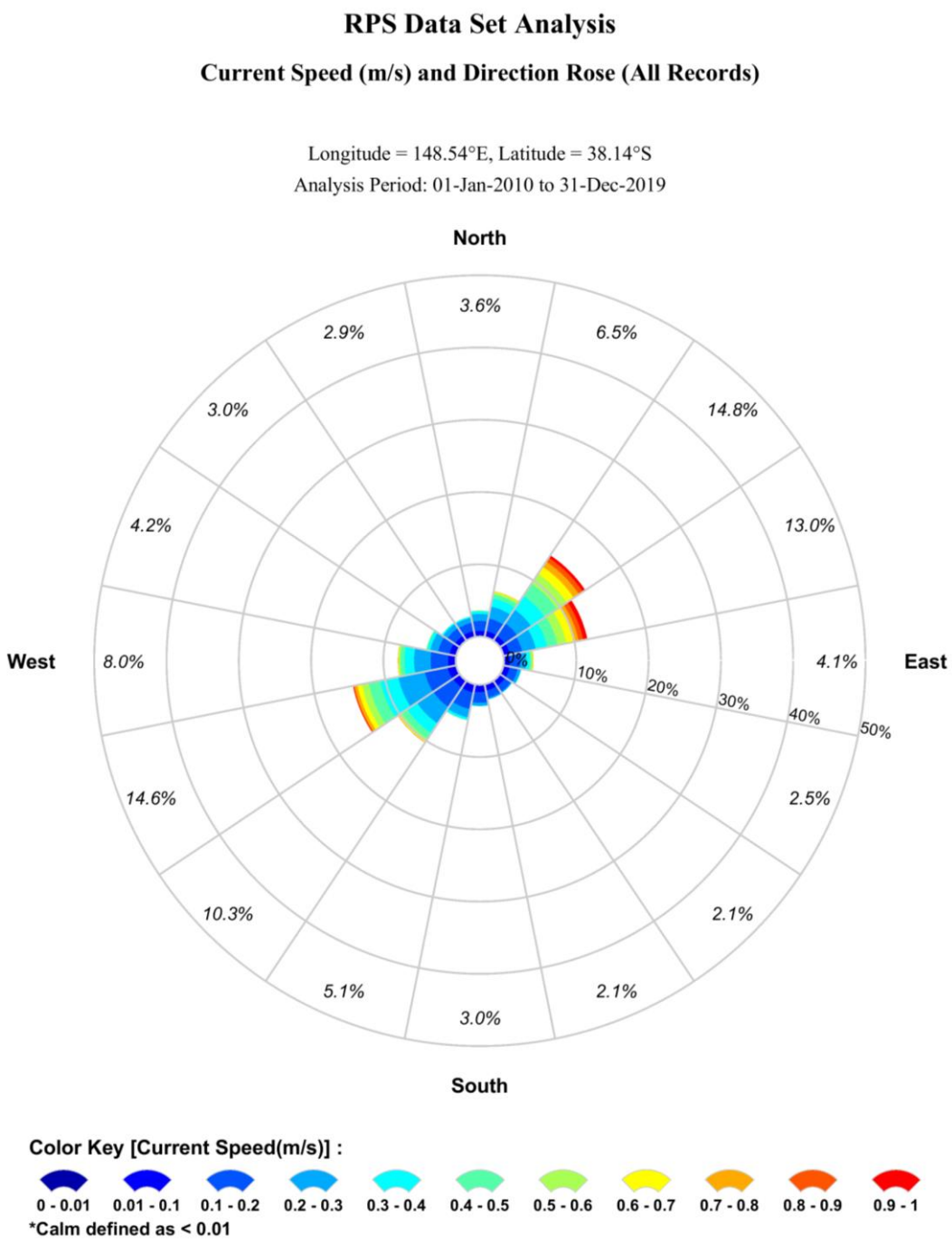


Figure 3.5 Total surface current rose plot at the release location, derived from the 2010 to 2019 modelled dataset.

4 WIND DATA

To account for the influence of the wind, data from 2010 to 2019 (inclusive) was sourced from the National Centre for Environmental Prediction (NCEP) Climate Forecast System Reanalysis (CFSR; see Saha et al., 2010). The CFSR wind model includes observations from many data sources; surface observations, upper-atmosphere air balloon observations, aircraft observations and satellite observations. The model is capable of accurately representing the interaction between the earth's oceans, land and atmosphere. The gridded wind data output is available at ¼ of a degree resolution (~33 km) and 1-hourly time intervals. Figure 4.1 shows the spatial resolution of the wind field used as input into the oil spill model.

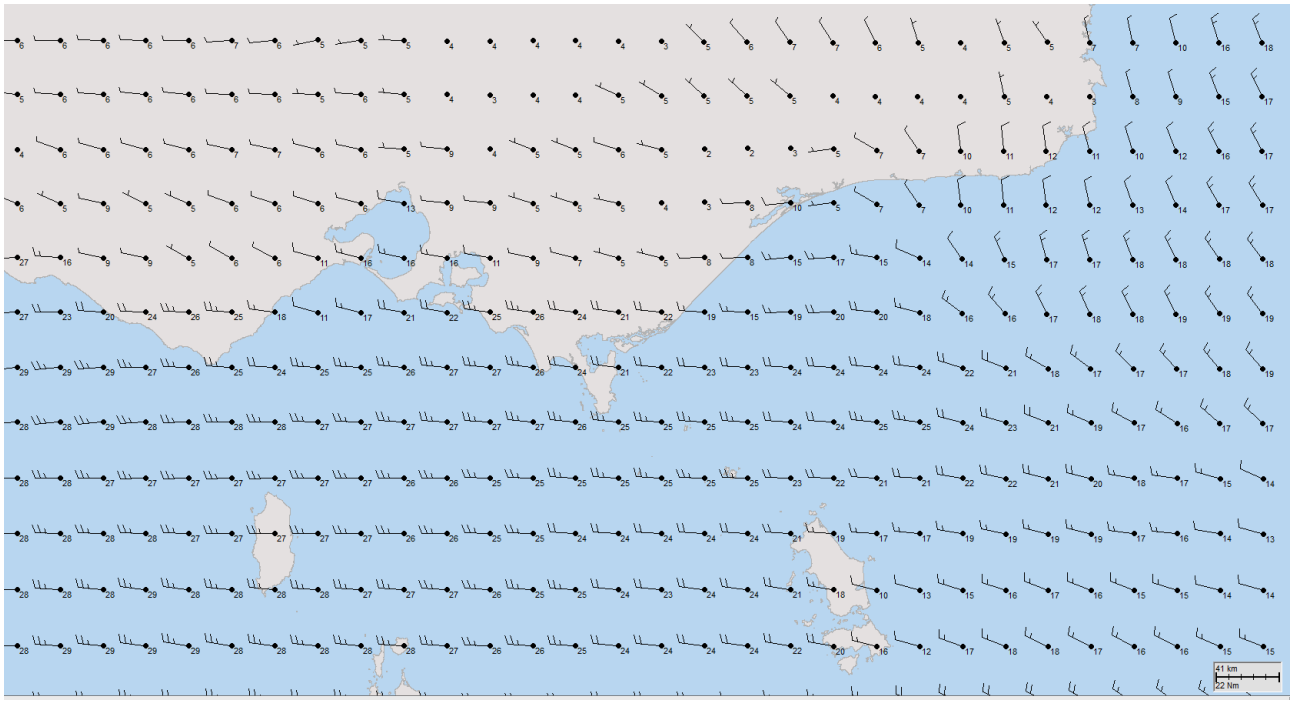


Figure 4.1 Spatial resolution of the CFSR modelled wind data used as input into the oil spill model. Note, for ease viewing only every second wind vector is displayed on the map.

Figure 4.2 and Figure 4.3 illustrates the monthly and total wind rose distributions nearby the release location, respectively.

Note that the atmospheric convention for defining wind direction, that is, the direction the wind blows from, is used to reference wind direction throughout this report. Each branch of the rose represents wind coming from that direction, with north to the top of the diagram. Sixteen directions are used. The branches are divided into segments of different colour, which represent wind speed ranges from that direction. Speed ranges of 5 knot intervals are typically used in these wind roses. The length of each segment within a branch is proportional to the frequency of winds blowing within the corresponding range of speeds from that direction.

The model wind data demonstrated that this region typically experiences moderate winds all year round and with monthly average wind speeds ranging between 13.3 knots (April) to 16.6 knots (July). The maximum monthly wind speeds ranged between 39.5 knots (January) and 49.9 knots (November). Winds typically blow from the southwest during the summer months, while winds are typically westerly during the winter months.

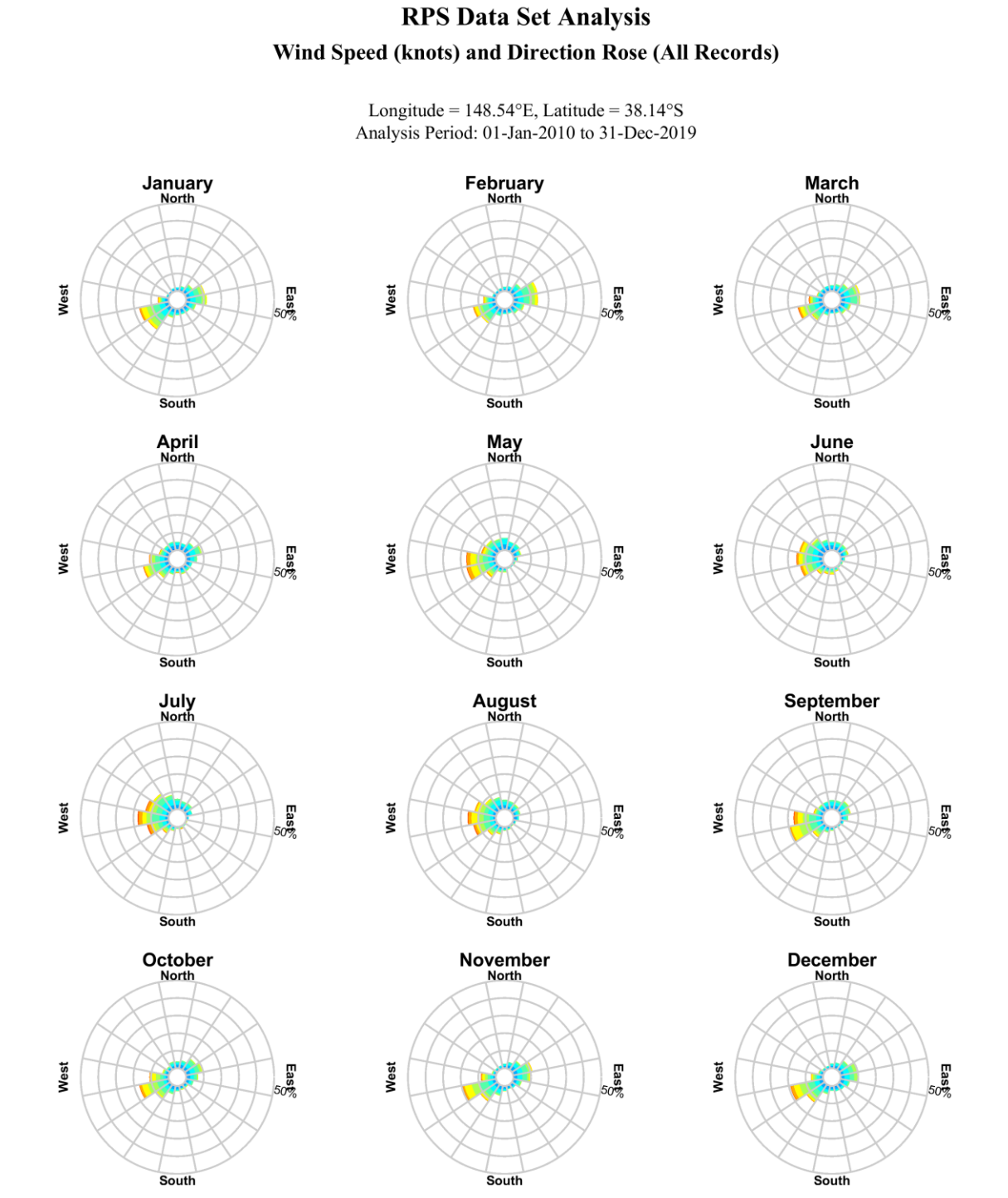


Figure 4.2 Monthly wind rose distributions adjacent to the release location, derived from the 2010 to 2019 modelled dataset.

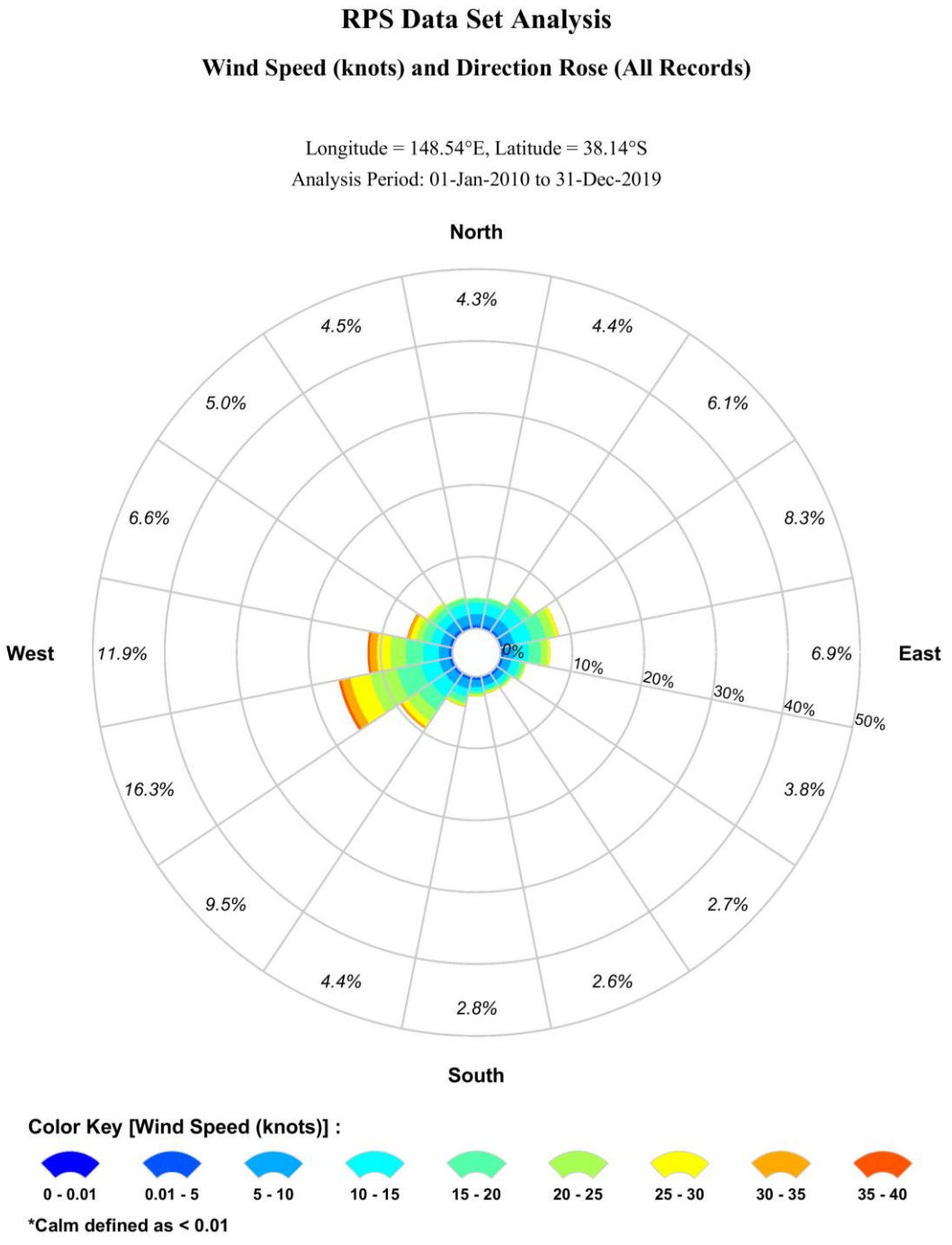


Figure 4.3 Total wind rose distributions adjacent to the release location, derived from the 2010 to 2019 modelled dataset.

5 WATER TEMPERATURE AND SALINITY

The monthly depth-varying water temperature and salinity profiles for the closest point to the release location was obtained from the World Ocean Atlas 2013 database produced by the National Oceanographic Data Centre (National Oceanic and Atmospheric Administration) and its co-located World Data Center for Oceanography (Levitus et al., 2013). The data is used to inform the weathering, movement and evaporative loss of hydrocarbon spills in the surface and subsurface layers.

Table 5.1 shows that the monthly average sea surface temperatures, which ranged from 14.0°C (July) to 20.3°C (March), whilst salinity remained relatively consistent throughout the year, ranging between 35.4 psu to 35.7 psu.

Figure 5.1 shows the vertical profile of water temperature and salinity for each month.

Table 5.1 Monthly average sea surface temperature and salinity near the release location in the 0-5 m depth layer.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Temperature (°C)	18.7	19.6	20.3	19.1	17.4	16.5	14.0	14.4	14.1	15.2	16.5	17.5
Salinity (psu)	35.5	35.4	35.7	35.6	35.4	35.5	35.4	35.5	35.4	35.5	35.4	35.4

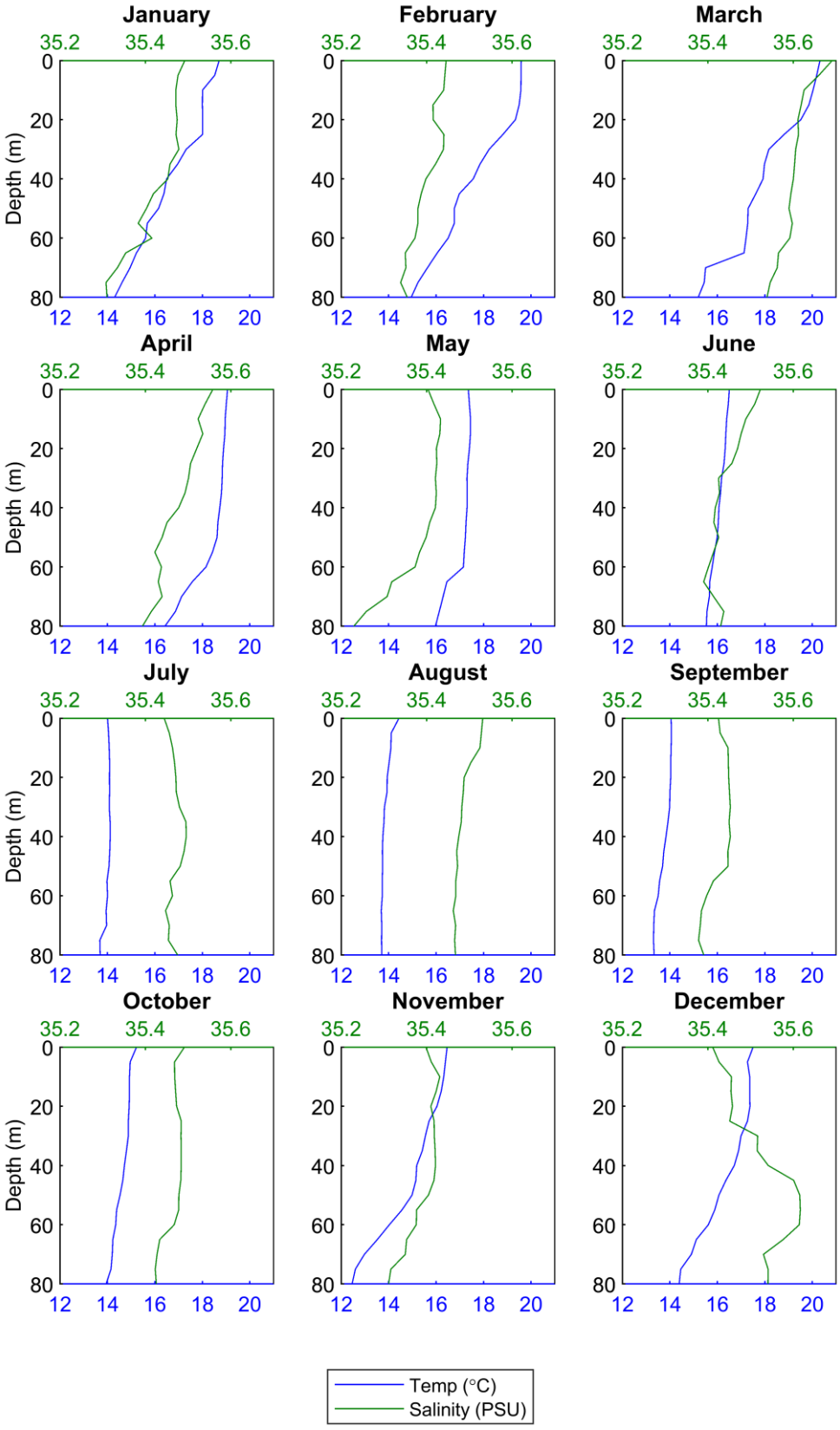


Figure 5.1 Monthly temperature and salinity profiles throughout the water column near the release location.

6 SUBSEA PLUME MODEL – OILMAP DEEP

In the event of an uncontrolled subsea LOWC, the gas and condensate will initially behave like a jet, which dissipates in the water column over a short distance (<10 m). The escaping condensate shears into small droplets due to turbulence generated by passing through the exit hole and subsequent turbulence generated in the plume jet. The size-distribution of the droplets will vary with the exit velocity and viscosity of the condensate. Following this phase, the density and buoyancy difference of the gas and condensate mixture relative to the surrounding waters, forces the plume upward. As the plume rises, the volume of gas will increase due to reduction of water pressure, with gas bubbles dividing into an increasing number of bubbles due to the shearing effect exerted by the water column.

In shallow water (<200 m) the rising plume of gas and condensate will tend to reach the sea surface before deflecting away from the centre of the plume (Spaulding et al., 2000). Figure 6.1 conceptually illustrates the various stages of a subsea release of oil and gas.

OILMAP Deep model (Spaulding et al. 2015) was used to simulate the near-field behaviour of the gas-condensate subsea release in two phases – the initial jet phase and the buoyant plume phase. The initial jet phase is predominately driven by the exit velocity. During this phase, the condensate droplet-size-distributions are calculated for a range of classes or bins. Next, the plume model predicts the rise dynamics of the condensate and gas plumes to calculate at which point gas lift will be lost (i.e. the trapping height).

Outputs which include the plume trapping height, plume diameter and droplet size distribution are used as input to the SIMAP model to simulate the rise and dispersion of the condensate droplets from this point onwards.

More details on the OILMAP-DEEP model, can be found in Spaulding et al. (2015). The model has been validated against observations from Deepwater Horizon as well as small and large-scale laboratory studies on subsurface oil releases (Brandvik et al 2013, 2014; Belore 2014; Spaulding et al. 2015; Li et al. 2017).

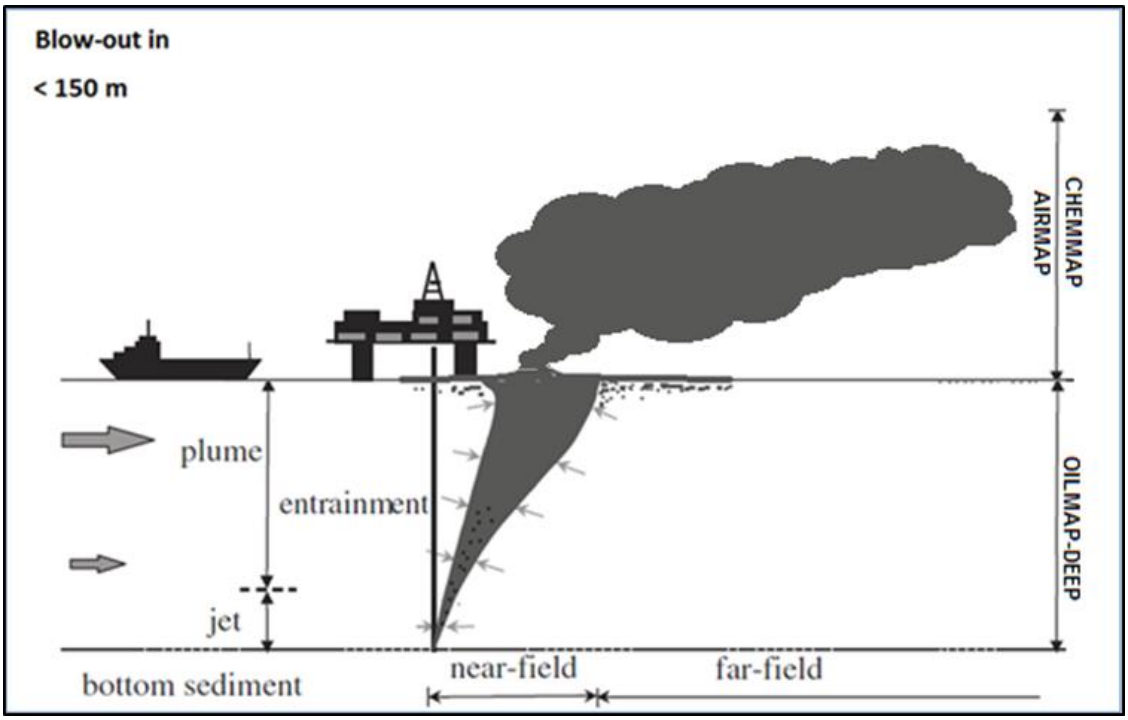


Figure 6.1 Example of a subsea plume and the various stages of the plume in the water column (Source: ASA, 2011).

Table 6.1 presents the input parameters and key results for the subsea plume modelling. Note a depleting release rate was assessed.

The subsea modelling showed that in the event of a LOWC, the amalgamated gas and condensate would propel rapidly upward from the seabed and rupture the sea surface. Droplet sizes would range from 524 µm to 2,263 µm during week 1 and 877 µm to 3,788 µm by week 11 due to the depleting release rate. There were 10 oil droplet-size classes defined, which were evenly distributed (10%), to simulate the rise and dispersion of the condensate droplets more accurately.

Table 6.1 Input data and key results for the subsea plume modelling.

Input Variable	Value
Scenario	Loss of Well Control
Water depth (m)	70
Tubing diameter (inch)	12.25
Condensate discharge rate (stb/day)	5,870 (week 1) depleting to 3,000 (week 11)
Gas rate (MMscf/day)	274.3 (week 1) depleting to 147.4 (week 11)
Formation water flow rate (stb/day)	0
Key results	
Plume execution depth (m BMSL)	0 (Breach the sea surface)
Droplet sizes (µm)	524 to 2,263 (week 1) to 877 to 3,788 (week 11)

7 OIL SPILL MODEL SIMAP

The spill modelling was carried out using a purpose-developed oil spill trajectory and fates model, SIMAP. This model is designed to simulate the transport and weathering processes that affect the outcomes of hydrocarbon spills to the sea, accounting for the specific oil type, spill scenario, and prevailing wind and current circulation patterns.

SIMAP is the evolution of the United States Environmental Protection Agency (US EPA) Natural Resource Damage Assessment model (French et al., 1999) and is designed to simulate the fate and effects of spilled oils and fuels for both the surface slick and the three-dimensional plume that is generated in the water column. SIMAP includes algorithms to account for both physical transport and weathering processes. The latter are important for accounting for the partitioning of the spilled mass over time between the water surface (surface slick), water column (entrained oil and dissolved compounds), atmosphere (evaporated compounds) and land (stranded oil). The model also accounts for the interaction between weathering and transport processes.

The physical algorithms calculate transport and spreading by physical forces, including surface tension, gravity and wind and current forces for both surface slicks and oil within the water column. The fates algorithms calculate all the weathering processes known to be important for oil spilled to marine waters. These include droplet and slick formation, entrainment by wave action, emulsification, dissolution of soluble components, sedimentation, evaporation, bacterial and photo-chemical decay and shoreline interactions. These algorithms account for the specific oil type being considered.

Entrainment is the physical process where globules of oil are transported from the sea surface into the water column by wind and wave-induced turbulence or be generated subsea by a pressurised discharge at depth. It has been observed that entrained oil is broken into droplets of varying sizes. Small droplets spread and diffuse into the water column, while larger ones rise rapidly back to the surface (Delvigne & Sweeney, 1988; Delvigne, 1991).

Dissolution is the process by which soluble hydrocarbons enter the water from a surface slick or from entrained droplets. The lower molecular weight hydrocarbons tend to be both more volatile and more soluble than those of higher molecular weight.

The formation of water-in-oil emulsions, or mousse, which is termed ‘emulsification’, depends on oil composition and sea state. Emulsified oil can contain as much as 80% water in the form of micrometre-sized droplets dispersed within a continuous phase of oil (Daling & Brandvik, 1991; Bobra, 1991; Daling et al., 1997; Fingas, 1995, 1997).

Entrainment, dissolution and emulsification rates are correlated to wave energy, which is accounted for by estimating wave heights from the sustained wind speed, direction and fetch (i.e. distance downwind from land barriers) at different locations in the domain. Dissolution rates are dependent upon the proportion of soluble, short-chained hydrocarbon compounds, and the surface area at the oil/water interface of slicks. Dissolution rates are also strongly affected by the level of turbulence. For example, dissolution rates will be relatively high at the site of the release for a deep-sea discharge at high pressure.

Evaporation can result in the transfer of large proportions of spilled oil from the sea surface to the atmosphere, depending on the type of oil. Evaporation rates vary over space and time dependent on the prevailing sea temperatures, wind and current speeds, the surface area of the slick and entrained droplets that are exposed to the atmosphere as well as the state of weathering of the oil. Evaporation rates will decrease over time, depending on the calculated rate of loss of the more volatile compounds. By this process, the model can differentiate between the fates of different oil types.

Decay (degradation) of hydrocarbons may occur as the result of photolysis, which is a chemical process energised by ultraviolet light from the sun, and by biological breakdown, termed biodegradation. Many types of marine organisms ingest, metabolise and utilise oil as a carbon source, producing carbon dioxide and water as by-products.

The SIMAP weathering algorithms include terms to represent these dynamic processes. Technical descriptions of the algorithms used in SIMAP and validations against real spill events are provided in French et al., (1999) and French-McCay (2004).

Input specifications for oil types include density, viscosity, pour-point, distillation curve (volume of oil distilled off versus temperature) and the aromatic/aliphatic component ratios within given boiling point ranges. The model calculates a distribution of the oil by mass into the following components:

a. Surface-bound or floating oil;

b. Entrained oil (non-dissolved oil droplets that are physically entrained by wave action);

c. Dissolved hydrocarbons (principally the aromatic and short-chained aliphatic compounds);

d. Evaporated hydrocarbons;

e. Sedimented hydrocarbons; and

f. Decayed hydrocarbons.

8 HYDROCARBON PROPERTIES

Table 8.1 and Table 8.2 summarise the physical properties and boiling point ranges for the MDO and condensate, respectively.

The MDO used in this study has a density of 829.1 kg/m^3 (API of 37.6) and a low pour point of -14°C. The low viscosity (4 cP) indicates that this oil will spread quickly when released and will form a thin to low thickness film on the sea surface, increasing the rate of evaporation.

Generally, about 6.0% of the MDO mass should evaporate within the first 12 hours (Boiling point (BP) < 180°C); a further 34.6% should evaporate within the first 24 hours (180°C < BP < 265°C); and an additional 54.4% should evaporate over several days (265°C < BP < 380°C). Approximately 5% (by mass) of MDO will not evaporate, though will decay slowly over time. The oil is categorised as a group II light-persistent oil according to the International Tankers Owners Pollution Federation (ITOPF, 2014) and US EPA/USCG classifications. The classification is based on the specific gravity of hydrocarbons in combination with relevant boiling point ranges.

Based on the reservoir modelling, Emperor Energy had indicated that the condensate is likely to have an API of 54.6, which is equivalent to a density of 760 kg/m^3. A proxy was carefully selected, which had a low viscosity of 0.875 cP and when exposed to the atmosphere, approximately 64% should evaporate within the first 12 – 24 hours (boiling point (BP) < 180 °C). A further 19% of the semi-volatiles should evaporate within the first 24 - 72 hours (180°C < BP < 265°C); and the low volatile portion (16%) should evaporate over a longer period (265°C < BP < 380°C). Only 1% of the condensate is considered persistent and will decay over time. It is classified as a Group I non persistent oil.

It is important to note that the low volatile and residual components for the condensate and MDO will have a strong tendency to physically entrain into the upper water column in the presence of moderate winds (i.e. >12 knots) and breaking waves but can re-float to the surface if these energies abate.

Table 8.1 Physical properties for the condensate and MDO.

Characteristic	Marine Diesel Oil (MDO)	Condensate
Density (kg/m^3)	829.1 (at 25 °C)	760 (at 15˚C)
API	37.6	54.6
Dynamic viscosity (cP)	4.0 (at 25 °C)	0.875 (at 20°C)
Hydrocarbon property category	Group II	Group I
Hydrocarbon property classification	Light persistent oil	Non-persistent oil

Table 8.2 Boiling point ranges for the condensate and MDO.

Characteristics	Non-Persistent			Persistent
	Volatile (%)	*Semi-volatile (%)*	*Low-volatility (%)*	*Residual (%)*
Boiling point (°C)	*<180*	*180-265*	*265-380*	*>380*
Marine diesel oil (MDO)	6.0	34.6	54.4	5.0
Condensate	64.0	19.0	16.0	1.0

9 THRESHOLDS

The SIMAP model will track oil concentrations to very low levels. Hence, it is useful to define meaningful threshold concentrations for the recording of contact by oil components and determining the probability of exposure at a location (calculated from the number of replicate simulations in which this contact occurred).

The judgement of meaningful levels is complicated and will depend upon the mode of action, sensitivity of the biota contacted, the duration of the contact and the toxicity of the compounds that are represented in the oil. The latter factor is further complicated by the change in the composition of an oil type over time due to weathering processes. Without specific testing of the oil types, at different states of weathering against a wide range of the potential local receptors, such considerations are beyond the scope of this investigation.

It is important to note that the thresholds herein are based on the thresholds outlined in the NOPSEMA Oil Spill Modelling Bulletin (NOPSEMA 2019), which are summarised in Table 9.1. Their relationship to exposure for the sea surface, shoreline, and water column (entrained and dissolved hydrocarbons) are presented in Sections 9.1 to 9.3. Supporting justifications of the adopted thresholds applied during the study and additional context relating to the area of exposure are also provided.

Table 9.1 Summary of the thresholds applied in this study.

Floating Oil Concentration (g/m^2)	Shoreline Oil Accumulation (g/m^2)	Entrained Hydrocarbons Concentration (ppb)	Instantaneous Dissolved Hydrocarbons (ppb)
1	10	10	10
10	100	100	50
50	1,000		400

9.1 Floating Oil

Floating oil concentrations are relevant to describing the risks of oil coating emergent reefs, vegetation in the littoral zone and shoreline habitats, as well as the risk to wildlife found on the water surface, such as marine mammals, reptiles, and birds. Floating oil is also visible at relatively low concentrations (> ~0.05 g/m^2). Hence, the area exposed to visible oil, which might trigger social or economic impacts, will be larger than the area where biological impacts might be expected.

The low threshold for floating oil exposure was set to 1 g/m^2, which equates approximately to an average thickness of 1 µm. It represents the practical limit of observing hydrocarbon sheens in the marine environment. This threshold is considered below levels which would cause environmental harm and is more indicative of the areas perceived to be affected due to its visibility on the sea-surface and potential to trigger temporary closures of areas (i.e., fishing grounds) as a precautionary measure.

Oil of this thickness is described as rainbow sheen in appearance, according to the Bonn Agreement Oil Appearance Code (Bonn Agreement, 2009; AMSA, 2014) (see Table 9.2). Figure 9.1 shows photographs highlighting the difference in appearance between a silvery sheen, rainbow sheen and metallic sheen.

Ecological impact has been estimated to occur at 10 g/m^2 (a film thickness of approximately 10 µm or 0.01 mm) (French et al.,1996 and French-McCay, 2009) as this level of fresh oiling has been observed to mortally impact some birds through adhesion of oil to their feathers, exposing them to secondary effects such as hypothermia. The appearance of oil at this average thickness has been described as a metallic sheen (Bonn Agreement, 2009). Concentrations above 10 g/m^2 is also considered the lower actionable threshold, where oil may be thick enough for containment and recovery as well as dispersant treatment (AMSA, 2015).

Oil concentrations on the sea surface of 25 g/m^2 (or greater) would be harmful for all birds that have landed in an oil film due to potential contamination of their feathers, with secondary effects such as loss of temperature regulation and ingestion of oil through preening (Scholten et al., 1996; Koops et al., 2004). The appearance of oil at this thickness is also described as metallic sheen (Bonn Agreement, 2009). For this study the high exposure threshold was set to 50 g/m^2 and above based on NOPSEMA (2019). This threshold can also be used to inform response planning. Table 9.3 is a summary of each threshold.

Table 9.2 The Bonn Agreement Oil Appearance Code.

Code	Description Appearance	Layer Thickness Interval (g/m^2 or µm)	Litres per km^2
1	Sheen (silvery/grey)	0.04 – 0.30	40 – 300
2	Rainbow	0.30 – 5.0	300 – 5,000
3	Metallic	5.0 – 50	5,000 – 50,000
4	Discontinuous True Oil Colour	50 – 200	50,000 – 200,000
5	Continuous True Oil Colour	≥ 200	≥ 200,000

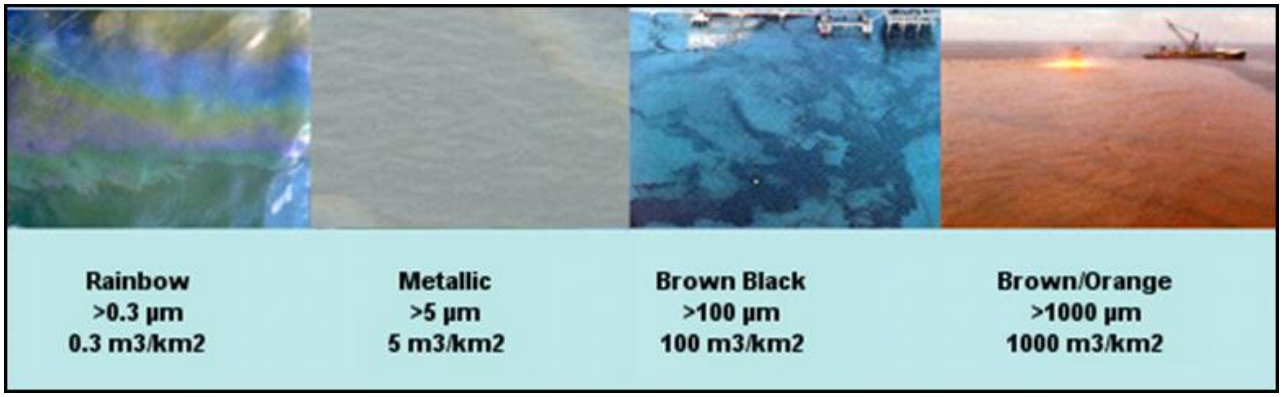


Figure 9.1 Photographs showing the difference between oil colour and thickness on the sea surface (source: adapted from Oil Spill Solutions, 2015).

Table 9.3 Floating oil exposure thresholds used in the oil spill modelling study (in alignment with NOPSEMA, 2019).

Threshold level	Floating oil (g/m^2)	Description
Low	1	Approximates range of socio-economic effects and establishes planning area for scientific monitoring
Moderate	10	Approximates lower limit for harmful exposures to birds and marine mammals
High	50*	Approximates surface oil slick and informs response planning

* 50 g/m^2 also used to define the threshold for actionable floating oil.

9.2 Shoreline Oil Accumulation

There are many different types of shorelines, ranging from cliffs, rocky beaches, sandy beaches, mud flats and mangroves, and each of these influences the volume of oil that can remain stranded ashore and its thickness before the shoreline saturation point occurs. For instance, a sandy beach may allow oil to percolate through the sand, thus increasing its ability to hold more oil ashore over tidal cycles and various wave actions than an equivalent area of water; hence oil can increase in thickness onshore over time. A sandy beach shoreline was assumed as the default shoreline type for the modelling in this study, as it allows for the highest carrying capacity of oil (of the available open/exposed shoreline types).

Previous risk assessment studies, a threshold of 10 g/m^2 was used to assess the potential for shoreline accumulation (French-McCay et al.,2005a; 2005b). This is a conservative threshold used to define regions of

socio-economic impact, such as triggering temporary closures of adjoining fisheries or the need for shore clean-up on beaches or man-made features/amenities (breakwaters, jetties, marinas, etc.). It would equate to approximately 2 teaspoons of hydrocarbon per square meter of shoreline accumulation. The appearance is described as a stain/film. On that basis, the 10 g/m^2 has been selected to define the low threshold.

French et al. (1996) and French-McCay (2009) define a shoreline oil accumulation threshold of 100 g/m^2, or above, would potentially harm shorebirds and wildlife (fur-bearing aquatic mammals and marine reptiles on or along the shore) based on studies for sub-lethal and lethal impacts. This threshold has been used in previous environmental risk assessment studies (see French-McCay, 2003; French-McCay et al., 2004, French-McCay et al., 2011; 2012; NOAA, 2013). Additionally, this threshold is also recommended in AMSA's foreshore assessment guide as the acceptable minimum thickness that does not inhibit the potential for recovery and is best remediated by natural coastal processes alone (AMSA, 2015). This threshold equates to approximately ½ a cup of oil per square meter of shoreline accumulation and is described as a thin oil coat. The 100 g/m^2 has been selected to define the moderate threshold.

Observations by Lin & Mendelssohn (1996) demonstrated that loadings of more than 1,000 g/m^2 of hydrocarbon during the growing season would be required to impact marsh plants significantly. Similar thresholds have been found in studies assessing hydrocarbon impacts on mangroves (Grant et al., 1993; Suprayogi & Murray, 1999). This loading equates to approximately 1 litre of hydrocarbon per square meter of shoreline accumulation and the appearance is described as a hydrocarbon cover. A loading of 1,000 g/m^2 has been selected to define high threshold.

Table 9.4 is a summary of each threshold.

Table 9.4 Shoreline accumulation thresholds used in oil spill modelling study (in alignment with NOPSEMA, 2019).

Threshold level	Shoreline loading(g/m^2)	Description
Low	10	Predicts potential for some socio-economic impact
Moderate	100*	Loading predicts area likely to require clean-up effort
High	1,000	Loading predicts area likely to require intensive clean-up effort

* 100 g/m^2 also used to define the threshold for actionable shoreline oil.

9.3 In-water

Oil is a mixture of thousands of hydrocarbons of varying physical, chemical, and toxicological characteristics, and therefore, demonstrate varying fates and impacts on organisms. As such, for in-water exposure, the SIMAP model provides separate outputs for dissolved and entrained hydrocarbons from oil droplets. The consequences of exposure to dissolved and entrained components will differ because they have different modes and magnitudes of effect.

Entrained hydrocarbon concentrations were calculated based on oil droplets that are suspended in the water column, though not dissolved. The composition of this oil would vary with the state of weathering (oil age) and may contain soluble hydrocarbons when the oil is fresh. Calculations for dissolved hydrocarbons specifically calculates oil components which are dissolved in water, which are known to be the primary source of toxicity exerted by oil.

A complicating factor that should be considered when assessing the consequence of dissolved and entrained oil distributions is that there will be some areas where both physically entrained oil droplets and dissolved hydrocarbons co-exist. Higher concentrations of each will tend to occur close to the source where sea conditions can force mixing of relatively unweathered oil into the water column, resulting in more rapid dissolution of soluble compounds.

9.3.1 Dissolved Hydrocarbons

Laboratory studies have shown that dissolved hydrocarbons exert most of the toxic effects of oil on aquatic biota (Carls et al., 2008; Nordtug et al., 2011; Redman, 2015). The mode of action is a narcotic effect, which is positively related to the concentration of soluble hydrocarbons in the body tissues of organisms (French-McCay, 2002). Dissolved hydrocarbons are taken up by organisms directly from the water column by absorption through external surfaces and gills, as well as through the digestive tract. Thus, soluble hydrocarbons are termed “bioavailable”.

Hydrocarbon compounds vary in water-solubility and the toxicity exerted by individual compounds is inversely related to solubility, however bioavailability will be modified by the volatility of individual compounds (Nirmalakhandan & Speece, 1988; Blum & Speece, 1990; McCarty, 1986; McCarty et al., 1992a, 1992b; McCarty & Mackay, 1993; Verhaar et al., 1992, 1999; Swartz et al., 1995; French-McCay, 2002; McGrath & Di Toro, 2009). Of the soluble compounds, the greatest contributor to toxicity for water-column and benthic organisms are the lower-molecular-weight aromatic compounds, which are both volatile and soluble in water. Although they are not the most water-soluble hydrocarbons within most oil types, the polynuclear aromatic hydrocarbons (PAHs) containing 2 – 3 aromatic ring structures typically exert the largest narcotic effects because they are semi-soluble and not highly volatile, so they persist in the environment long enough for significant accumulation to occur (Anderson et al., 1974, 1987; Neff & Anderson, 1981; Malins & Hodgins, 1981; McAuliffe, 1987; NRC, 2003). The monoaromatic hydrocarbons (MAHs), including the BTEX compounds (benzene, toluene, ethylbenzene, and xylenes), and the soluble alkanes (straight chain hydrocarbons) also contribute to toxicity, but these compounds are highly volatile, so that their contribution will be low when oil is exposed to evaporation and higher when oil is discharged at depth where volatilisation does not occur (French-McCay, 2002).

French-McCay (2002) reviewed available toxicity data, where marine biota was exposed to dissolved hydrocarbons prepared from oil mixtures, finding that 95% of species and life stages exhibited 50% population mortality (LC_{50}) between 6 and 400 ppb (with an average of 50 ppb) total PAH concentration after 96 hrs exposure. Therefore, concentrations lower than 6 ppb total PAH value should be protective of 97.5% of species and life stages even with exposure periods of days (at least 96 hours). Early life-history stages of fish appear to be more sensitive than older fish stages and invertebrates.

Exceedances of 10, 50 or 400 ppb over a 1-hour timestep (see Table 9.5) were applied in this study to indicate the increasing potential for sub-lethal to lethal toxic effects (or low to high), based on NOPSEMA (2019).

9.3.2 Entrained Hydrocarbons

Entrained hydrocarbons consist of oil droplets that are suspended in the water column and insoluble. Insoluble compounds in oil cannot be absorbed from the water column by aquatic organisms, therefore they are not bioavailable through absorption of compounds from the water. Exposure to these compounds would require routes of uptake other than absorption of soluble compounds. The route of exposure of organisms to whole oil alone include direct contact with tissues of organisms and uptake of oil by direct consumption, with potential for biomagnification through the food chain (NRC, 2003).

Thresholds of 10 ppb and 100 ppb were applied over a 1-hour time exposure (Table 9.5) as per NOPSEMA (2019).

The 10-ppb threshold exposure zone is not considered to be of significant biological impact and represents the area contacted by the spill.

Table 9.5 Dissolved and entrained hydrocarbon exposure thresholds assessed over a 1-hour time step used in the oil spill modelling study (in alignment NOPSEMA 2019).

	Exposure level	In-water threshold (ppb)	Description
Dissolved hydrocarbons	Low	10	Establishes planning area for scientific monitoring based on potential for exceedance of water quality triggers
	Moderate	50	Approximates potential toxic effects, particularly sublethal effects to sensitive species
	High	400	Approximates toxic effects including lethal effects to sensitive species
Entrained hydrocarbons	Low	10	Establishes planning area for scientific monitoring based on potential for exceedance of water quality triggers
	High	100	As appropriate given oil characteristics for informing risk evaluation

9.4 Dispersion

A horizontal dispersion coefficient of 10 m^2/s was used to account for dispersive processes acting at the surface that are below the scale of resolution of the input current field, based on typical values for open waters (Okubo, 1971). Dispersion rates within the water column (applicable for entrained and dissolved plumes of hydrocarbons) were specified at 1 m^2/s, based on empirical data for the dispersion of hydrocarbon plumes over the North West Shelf (King & McAllister, 1998).

10 RECEPTORS

A range of environmental receptors and shorelines were assessed for floating oil exposure, shoreline contact and water column exposure (entrained and dissolved hydrocarbons) as part of the study (see Figure 10.1 to Figure 10.18). Receptor categories are shown in Table 10.1 which includes coastal and offshore islands grouped as shorelines. All other sensitive receptors other than submerged reefs, shoals and banks (RSB) were sourced from Australian Government Department of Agriculture, Water and the Environment (http://www.environment.gov.au/). Results were separately calculated for each receptor and have been tabulated, except for the two receptors that the release location resides within (Twofold Shelf IMCRA and Upwelling East of Eden KEF).

Table 10.1 Summary of receptors assessed for potential oil exposure.

Receptor Category	Acronym	Hydrocarbon Exposure and Accumulation Assessment			Figure reference
		Floating oil	Water Column	Shoreline	
Australian Marine Park	AMP	✓	✓	×	Figure 10.1
Aquatic Reserve	AQR	✓	✓	×	Figure 10.2
Conservation Area	CA	✓	✓	×	Figure 10.3
Conservation Park	CP	✓	✓	×	Figure 10.4
Integrated marine and coastal regionalisation areas - Meso-scale Bioregions	IMCRA	✓	✓	×	Figure 10.5
Marine National Parks	MNP	✓	✓	×	Figure 10.6
Marine Park	MP	✓	✓	×	Figure 10.7
Marine Sanctuary	MS				Figure 10.8
National Park	NP	✓	✓	×	Figure 10.9
National Parks Act Schedule 4 park or reserve	NPS4	✓	✓	×	Figure 10.10
Nature Reserve	NR	✓	✓	×	Figure 10.11
Ramsar Sites	Ramsar	✓	✓	×	Figure 10.12
Reefs, Shoals and Banks	RSB	✓	✓	×	Figure 10.13
Key Ecological Feature	KEF	✓	✓	×	Figure 10.14
State Waters	State Waters	✓	✓	×	
Shorelines	Shore	✓ (Reported as: Nearshore Waters)	✓ (Reported as: Nearshore Waters)	✓	Figure 10.15 to Figure 10.18

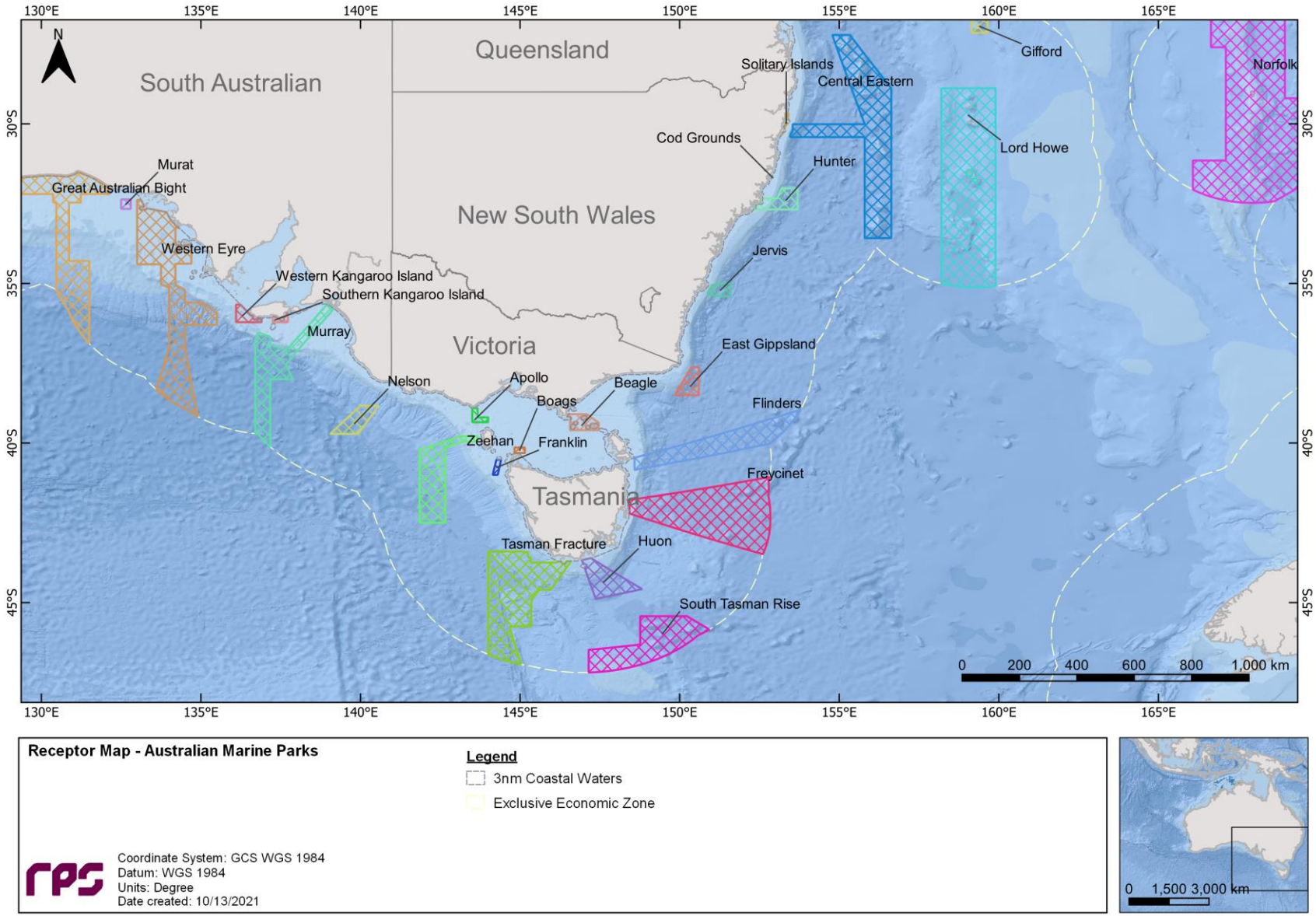


Figure 10.1 Receptor map for Australian Marine Parks (AMP).

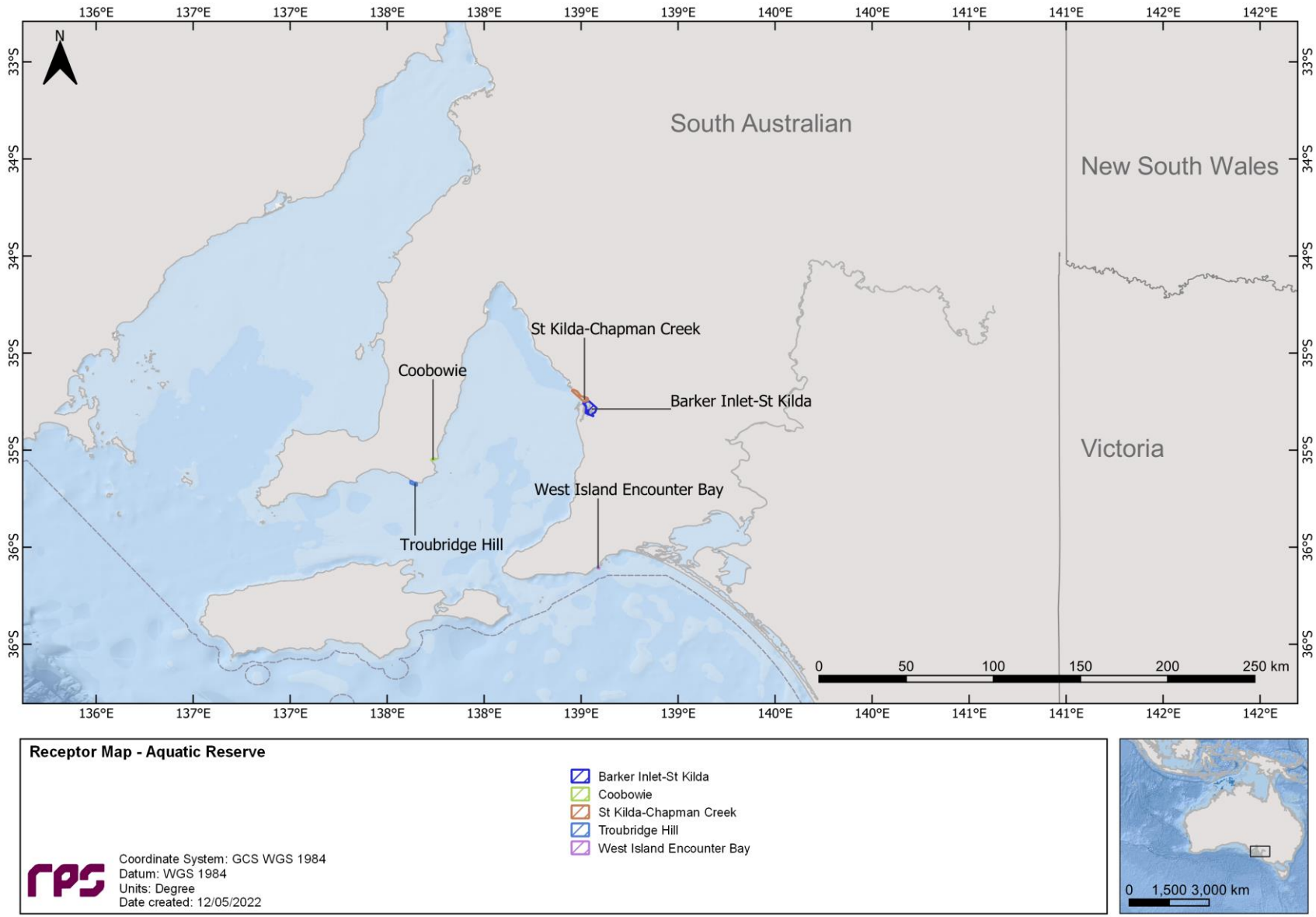


Figure 10.2 Receptor map for Aquatic Reserves (AQR).

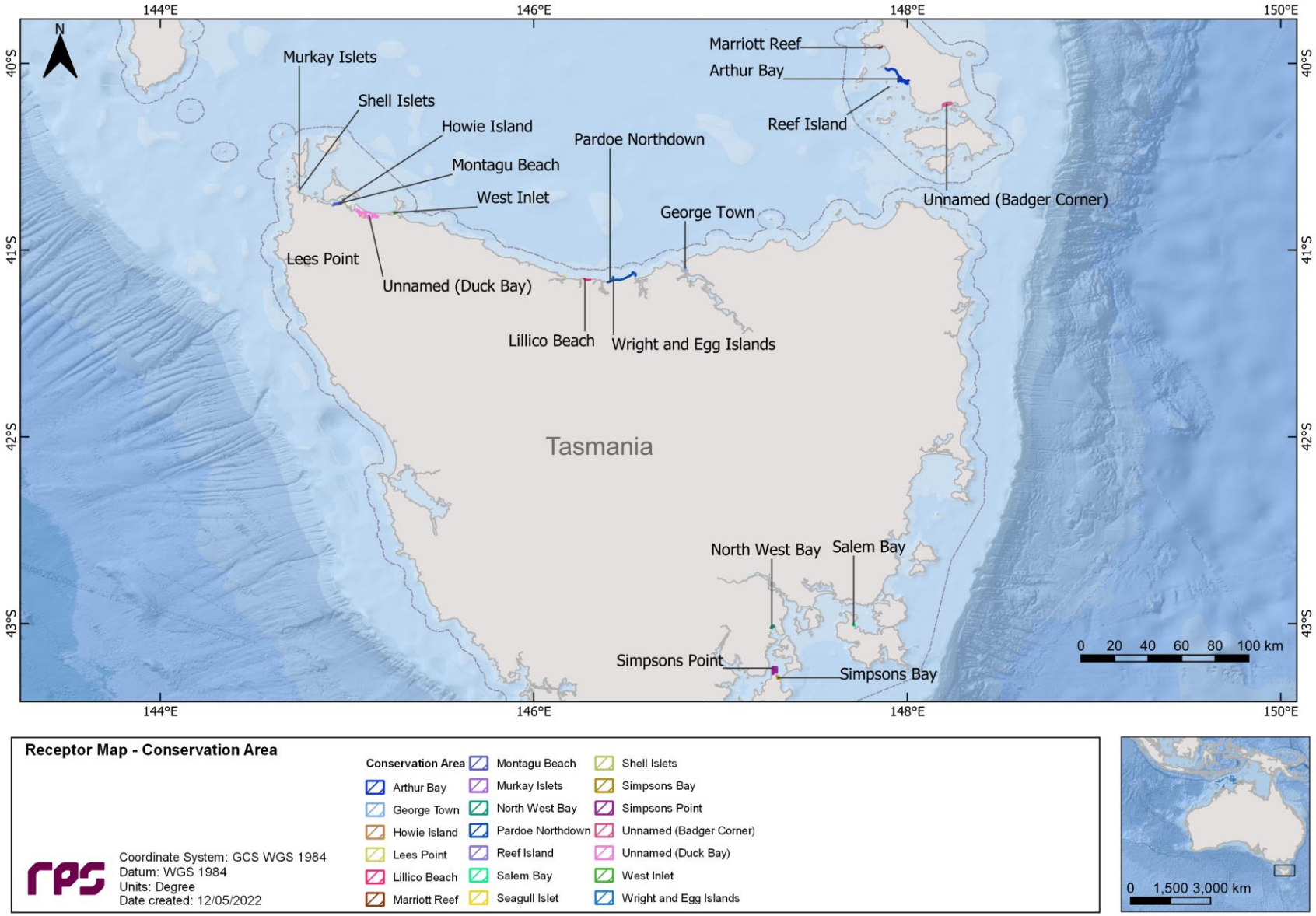


Figure 10.3 Receptor map for Conservation Area (CA).

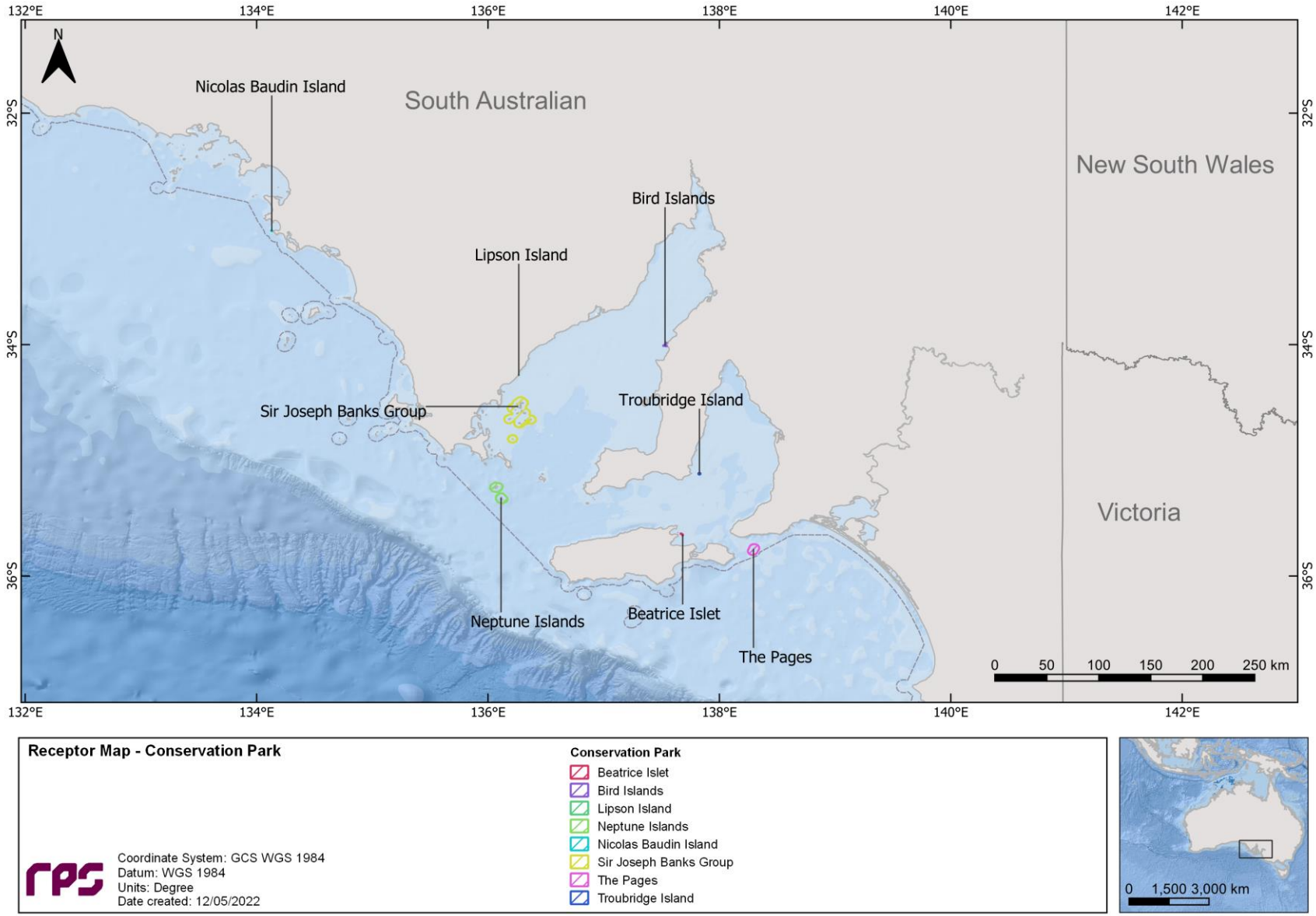


Figure 10.4 Receptor map for Conservation Park (CP).

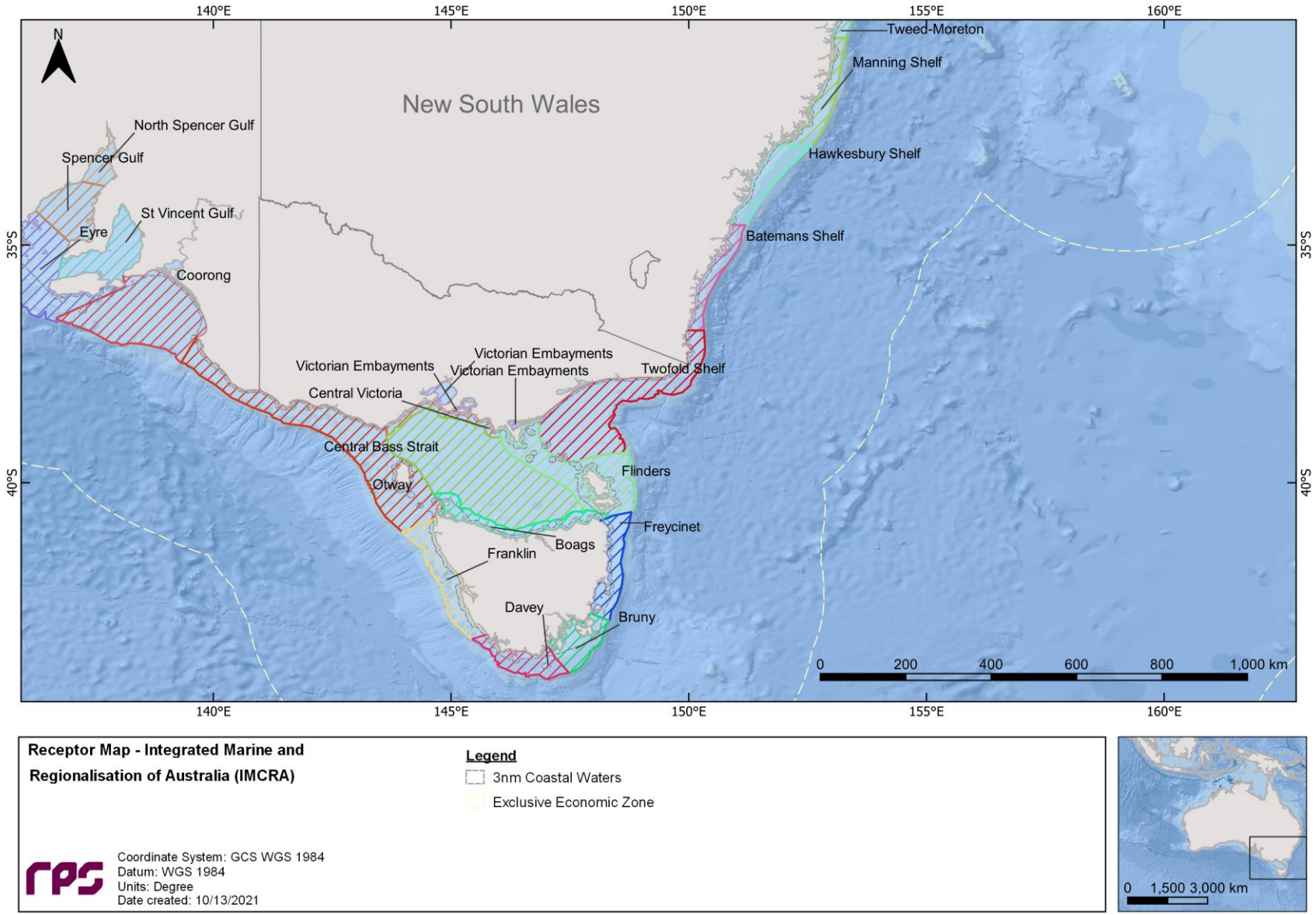


Figure 10.5 Receptor map for integrated marine and coastal regionalisation (IMCRA) areas.

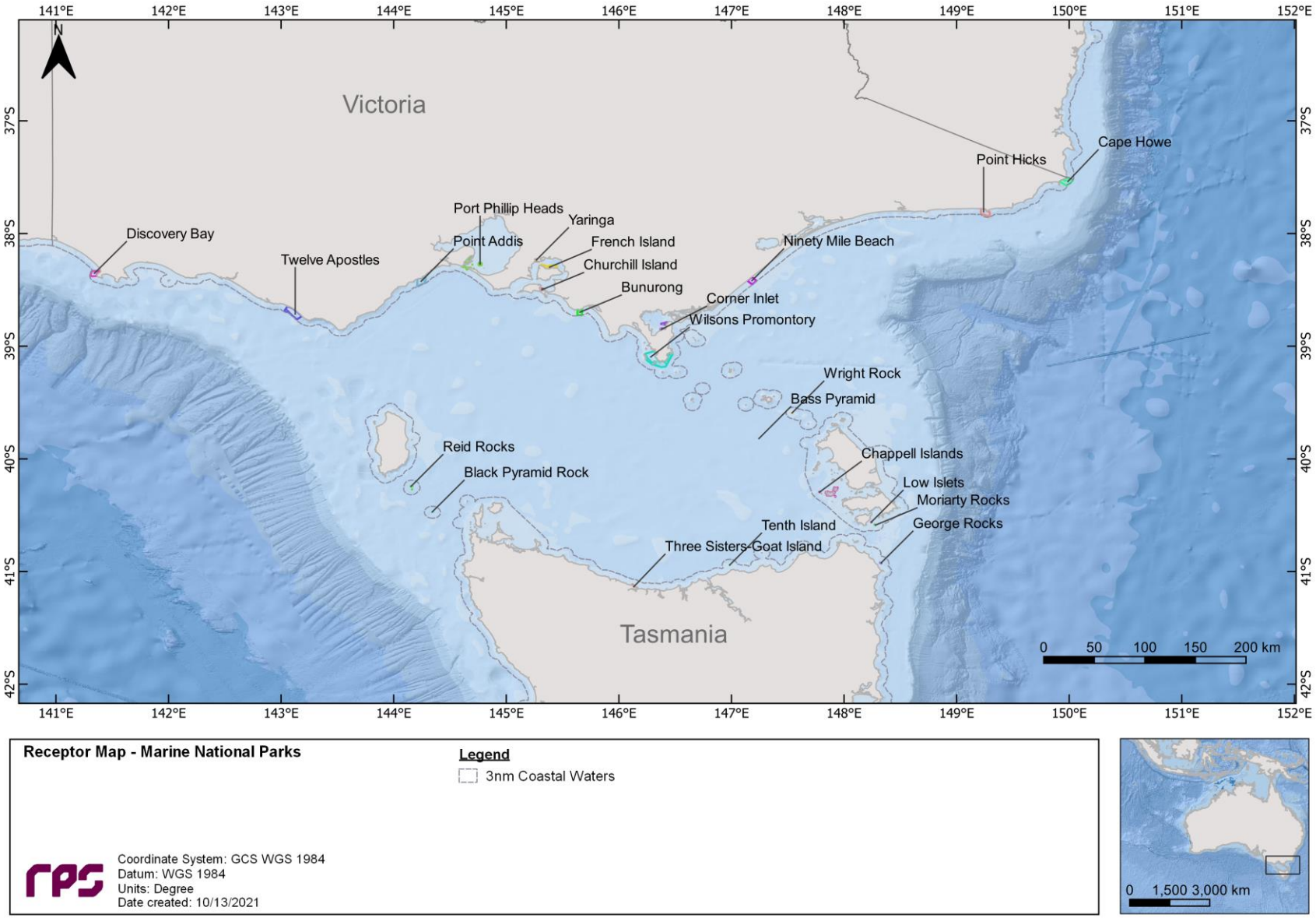


Figure 10.6 Receptor map for Marine National Parks (MNP).

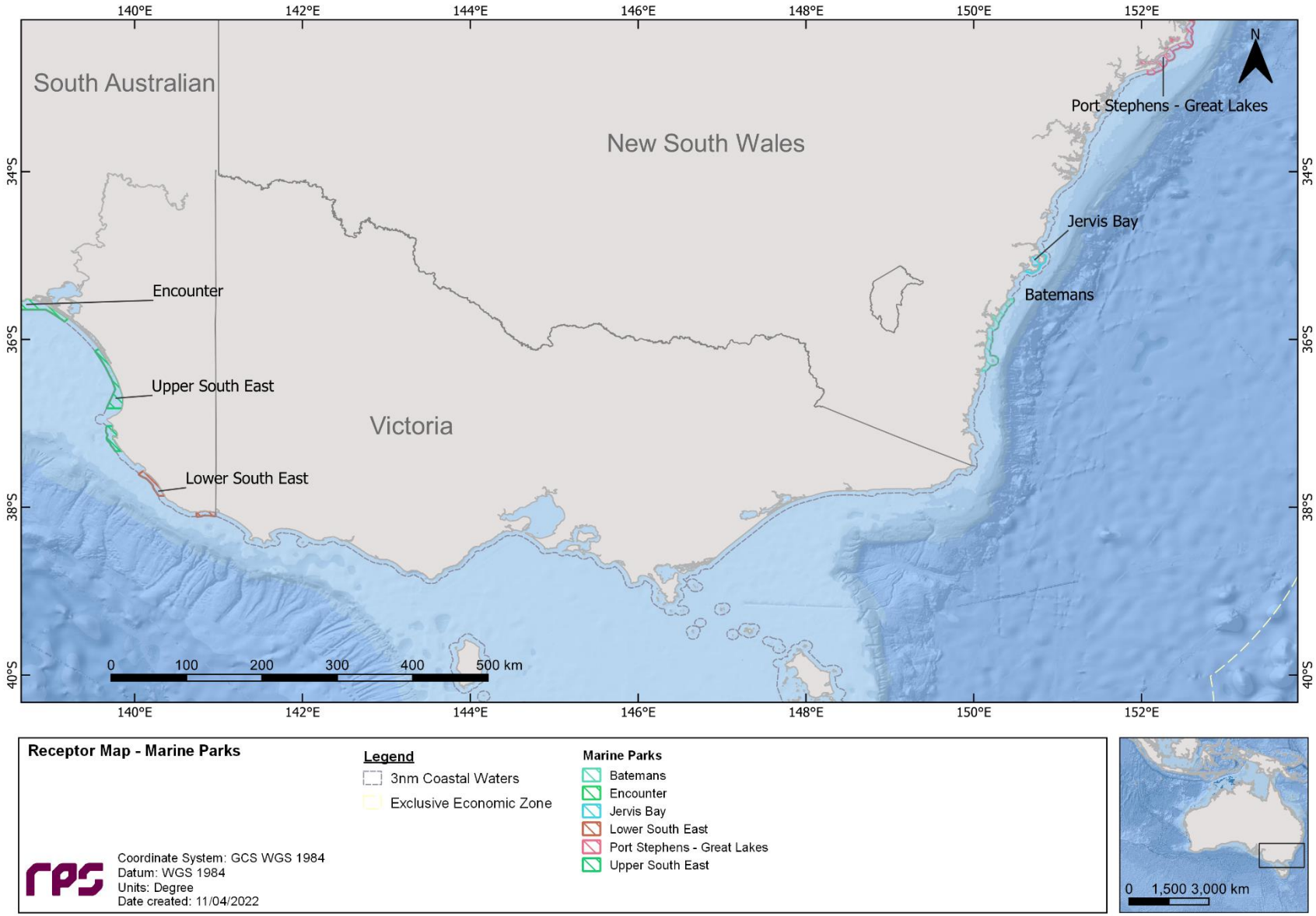


Figure 10.7 Receptor map for Marine Parks (MP).

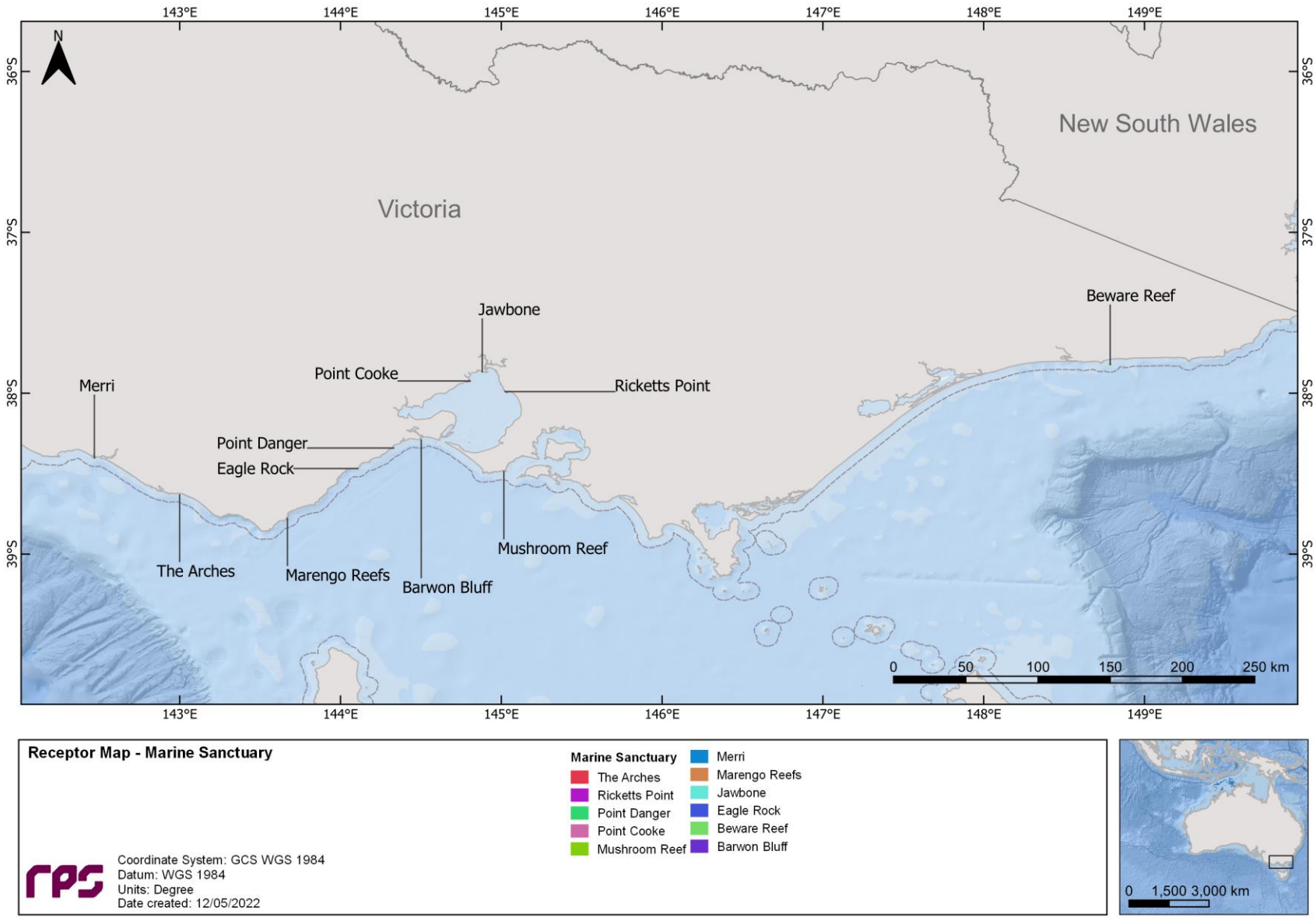


Figure 10.8 Receptor map for Marine Sanctuary.

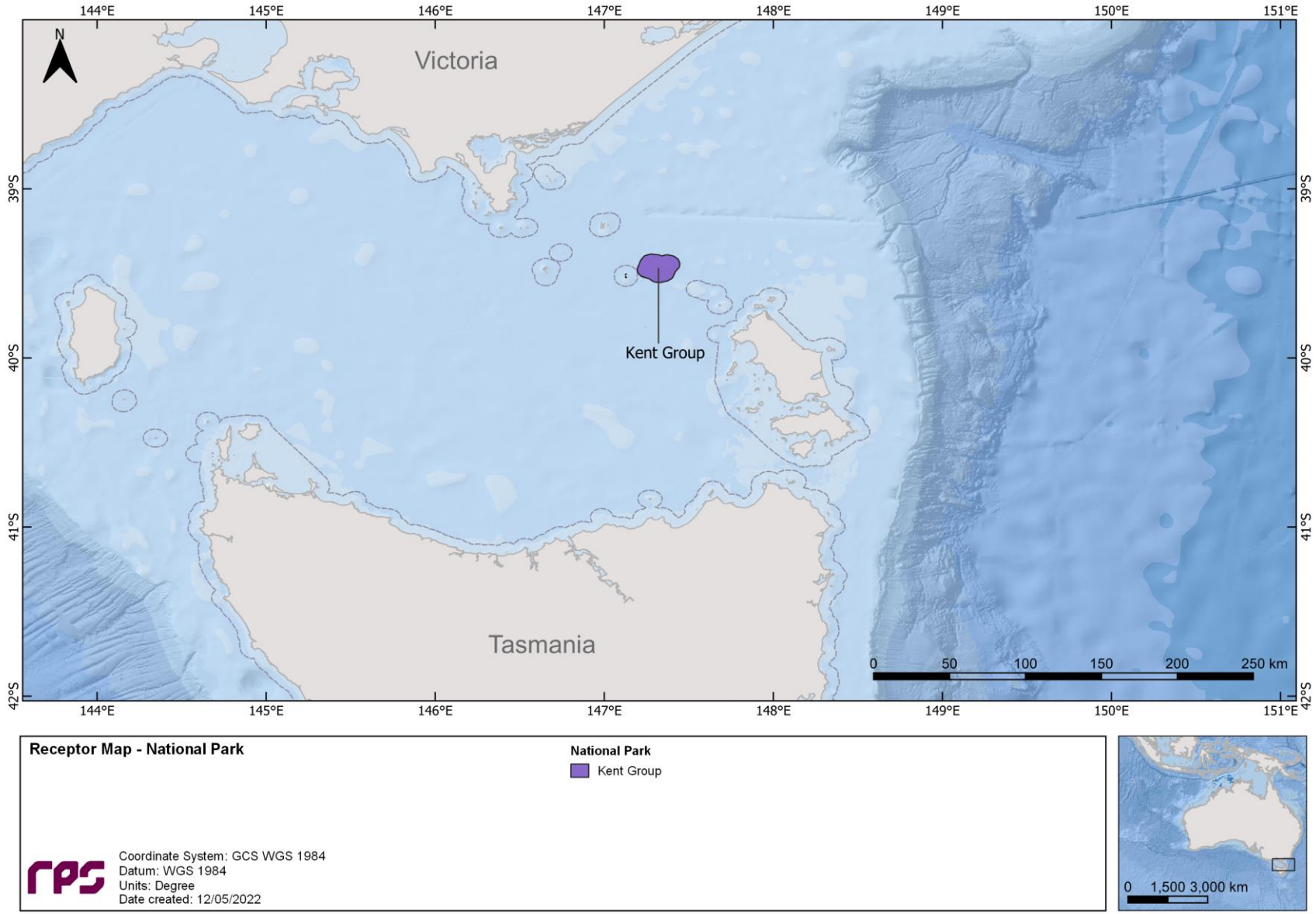


Figure 10.9 Receptor map for National Park (NP).

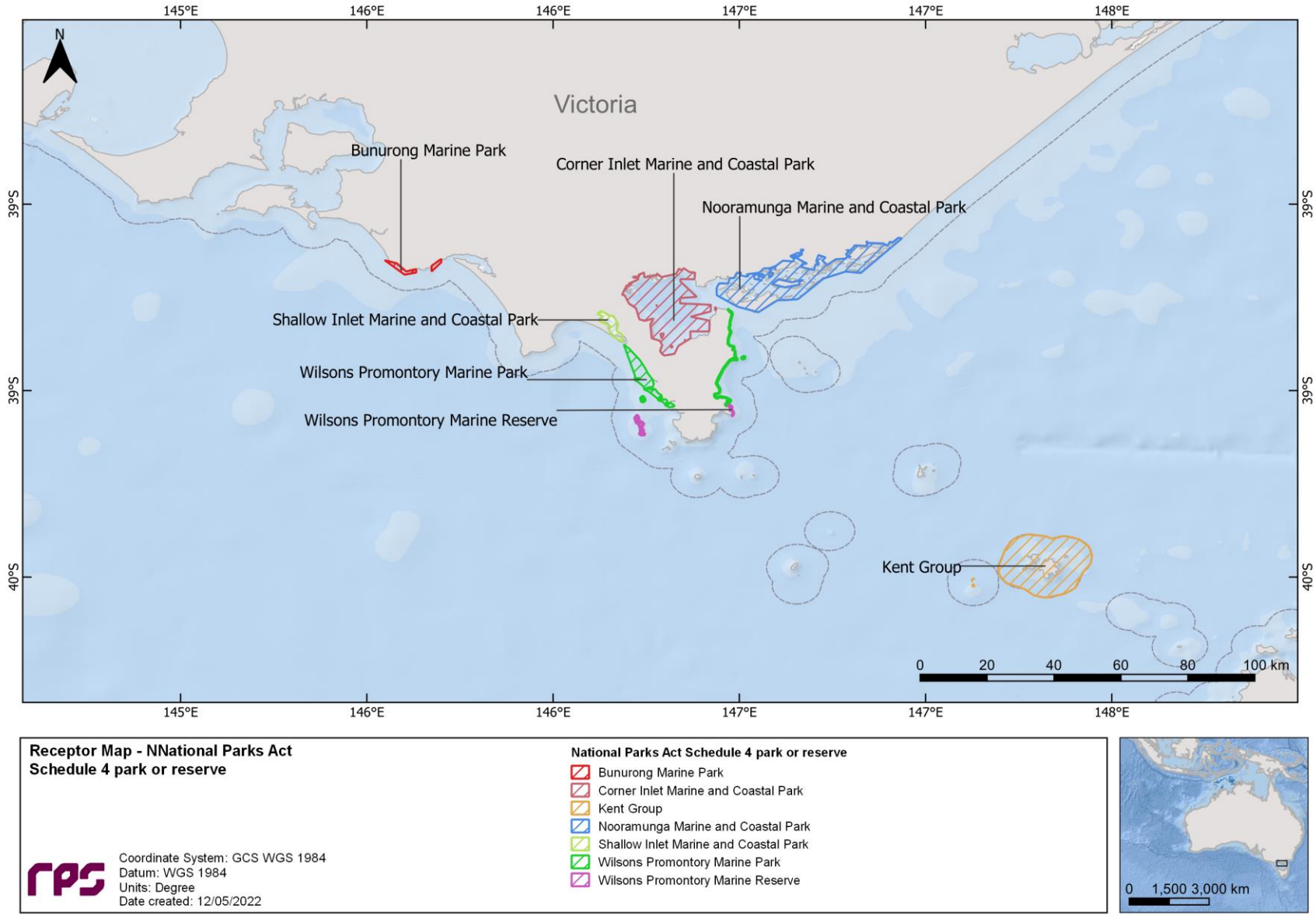


Figure 10.10 Receptor map for National Parks Act Schedule 4 park or reserve (NSP4).

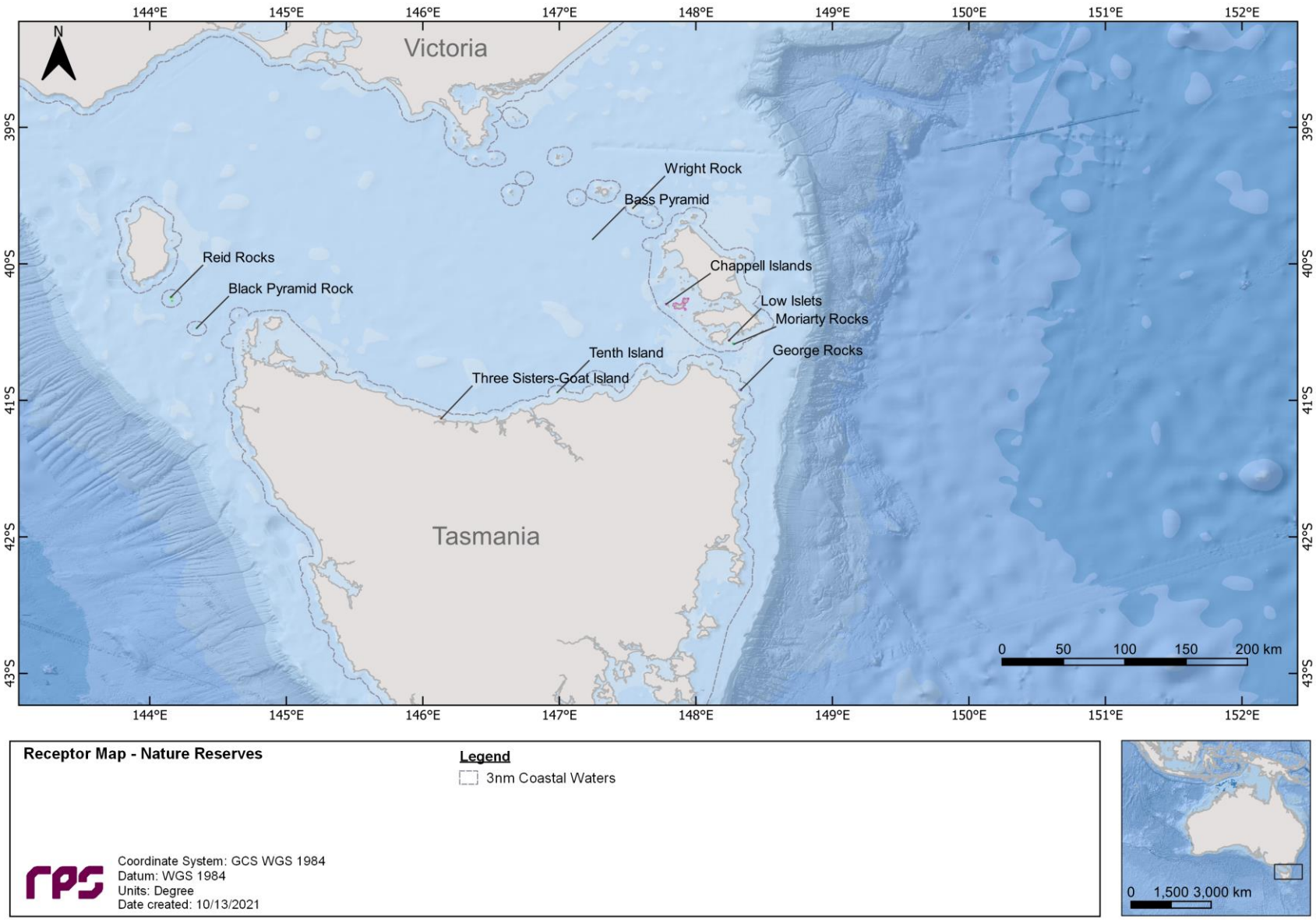


Figure 10.11 Receptor map for Nature Reserves (NR).

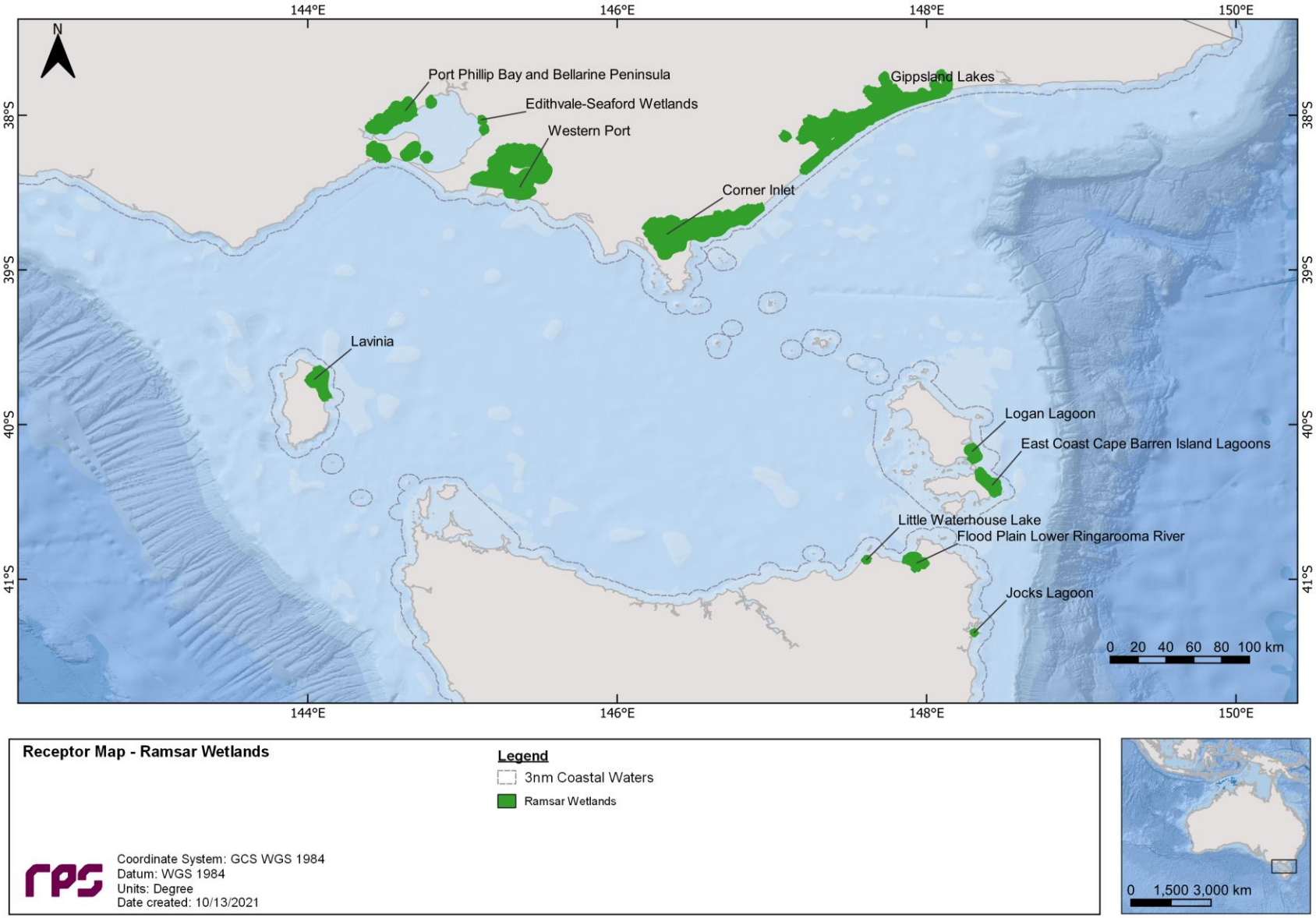


Figure 10.12 Receptor map for Ramsar Sites (Ramsar).

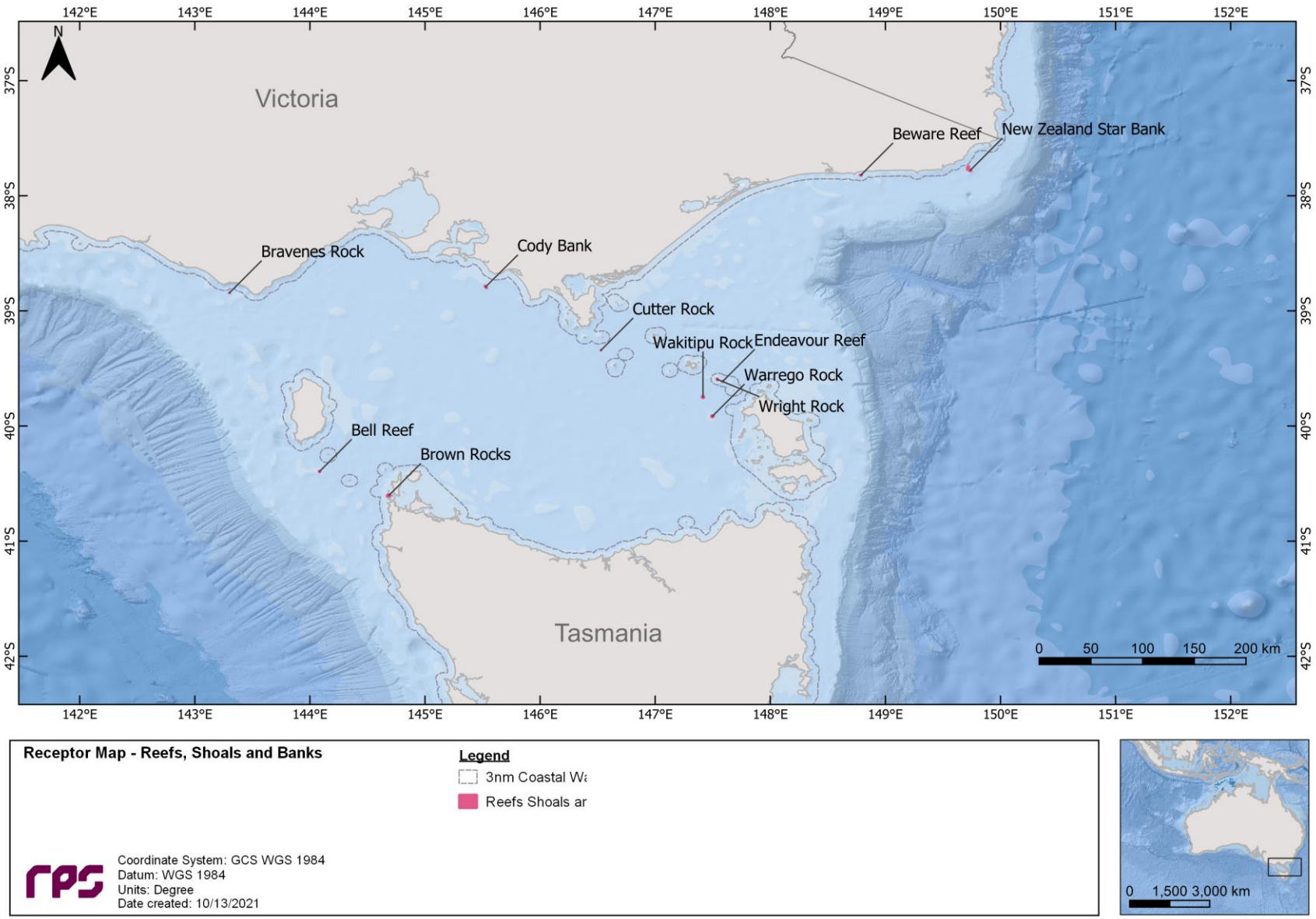


Figure 10.13 Receptor map for Reefs, Shoals and Banks (RSB).

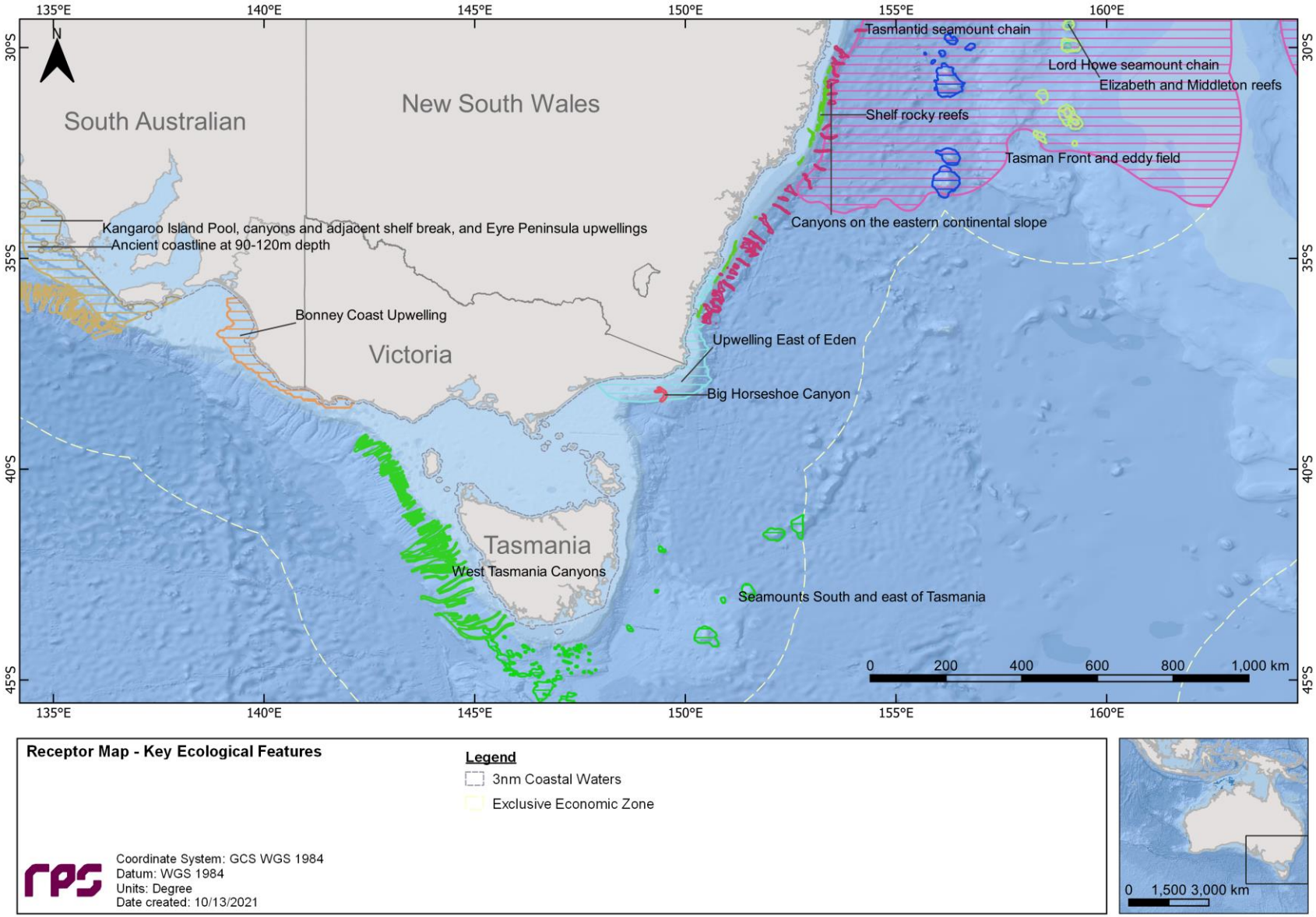


Figure 10.14 Receptor map for Key Ecological Features (KEF).

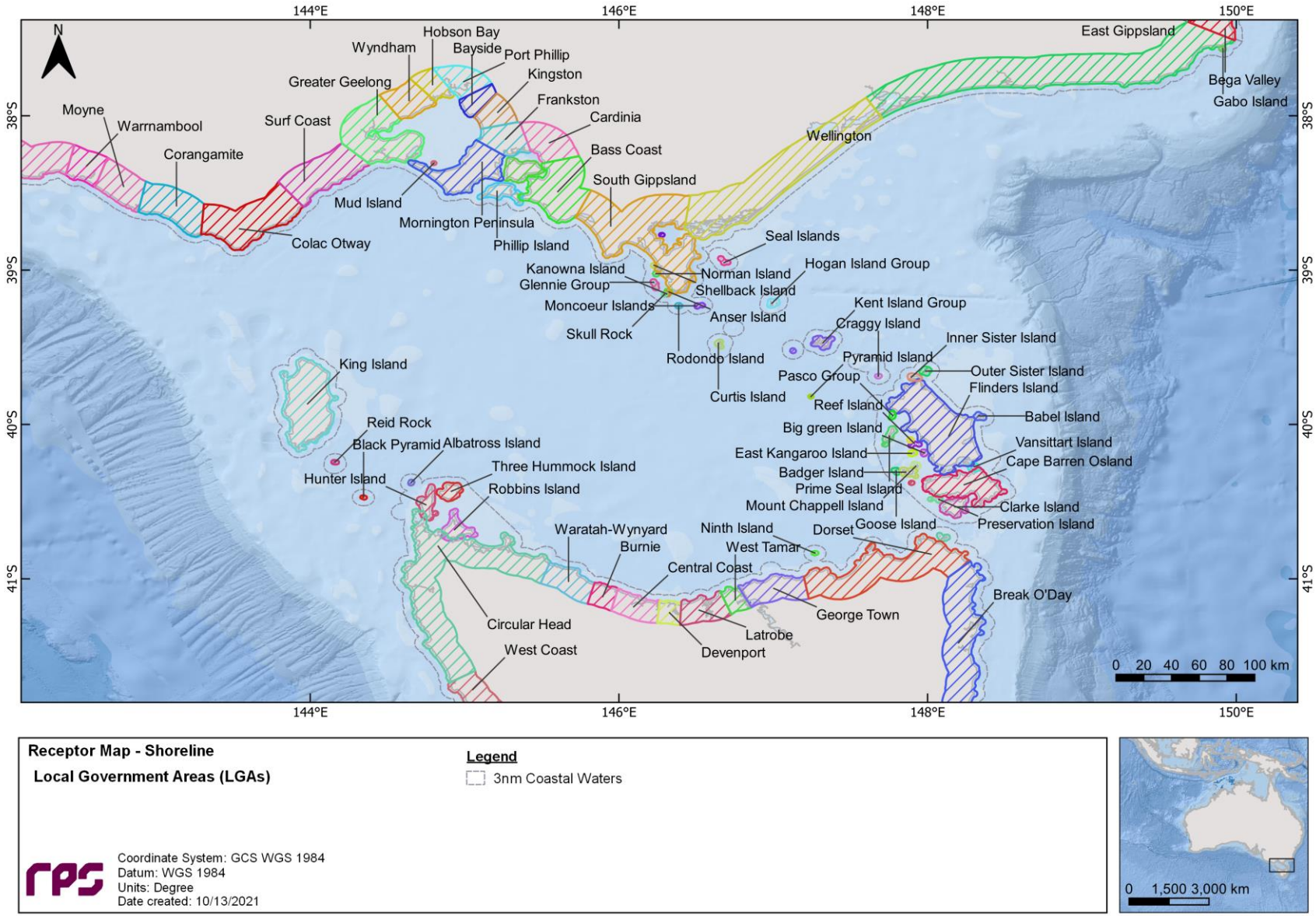


Figure 10.15 Receptor map for shorelines (1 of 4).

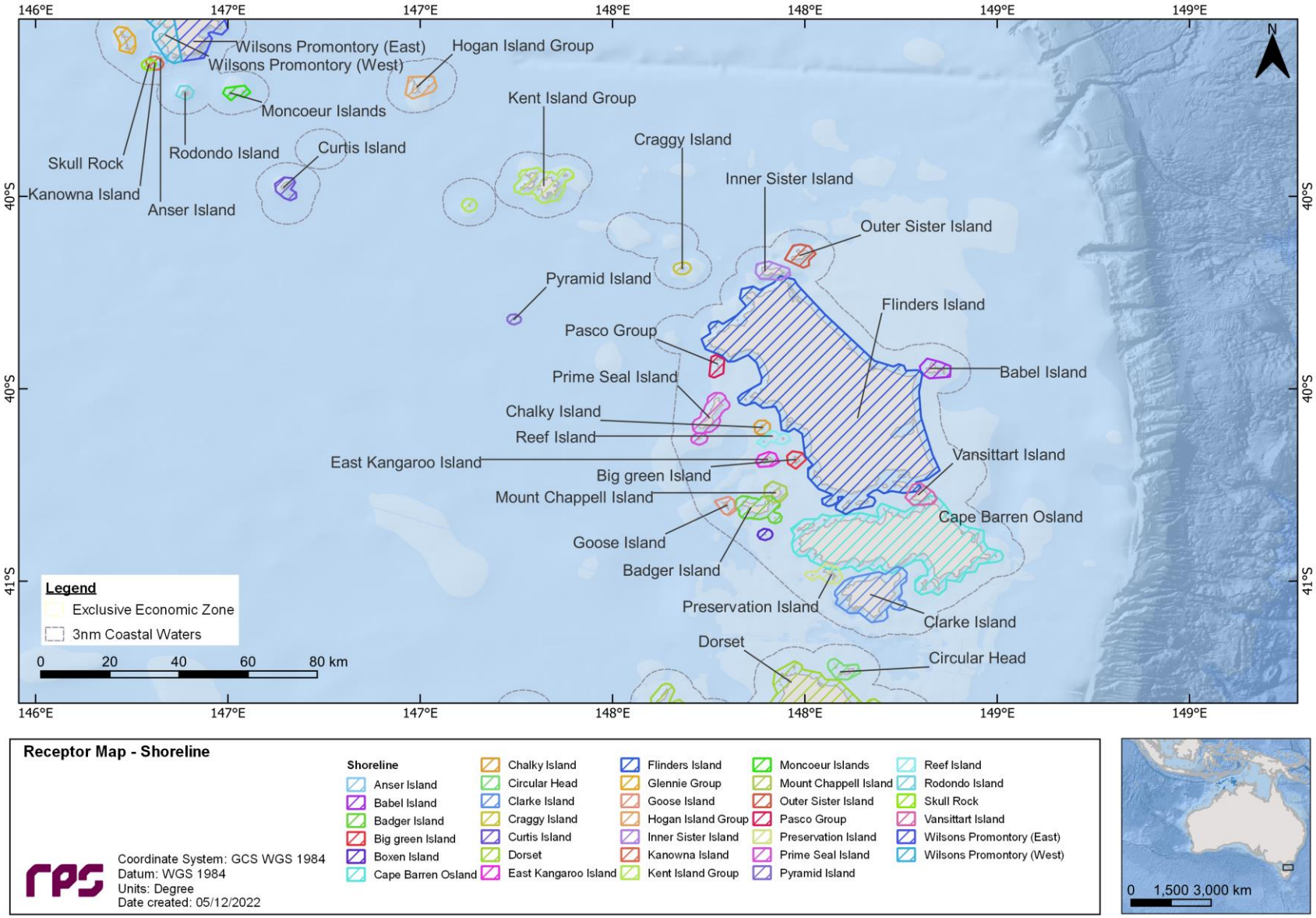


Figure 10.16 Receptor map for shorelines (2 of 4).

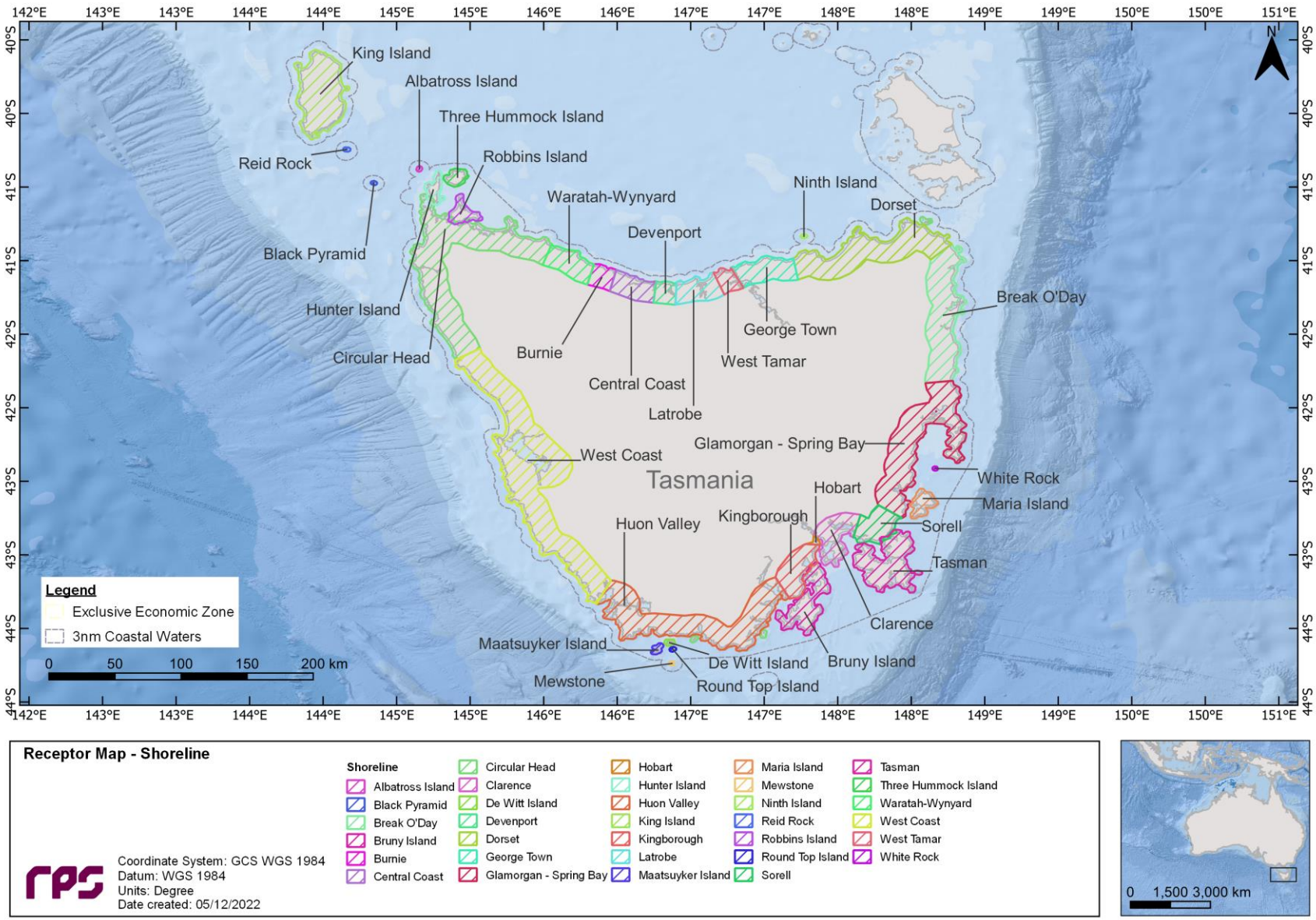


Figure 10.17 Receptor map for shorelines (3 of 4).

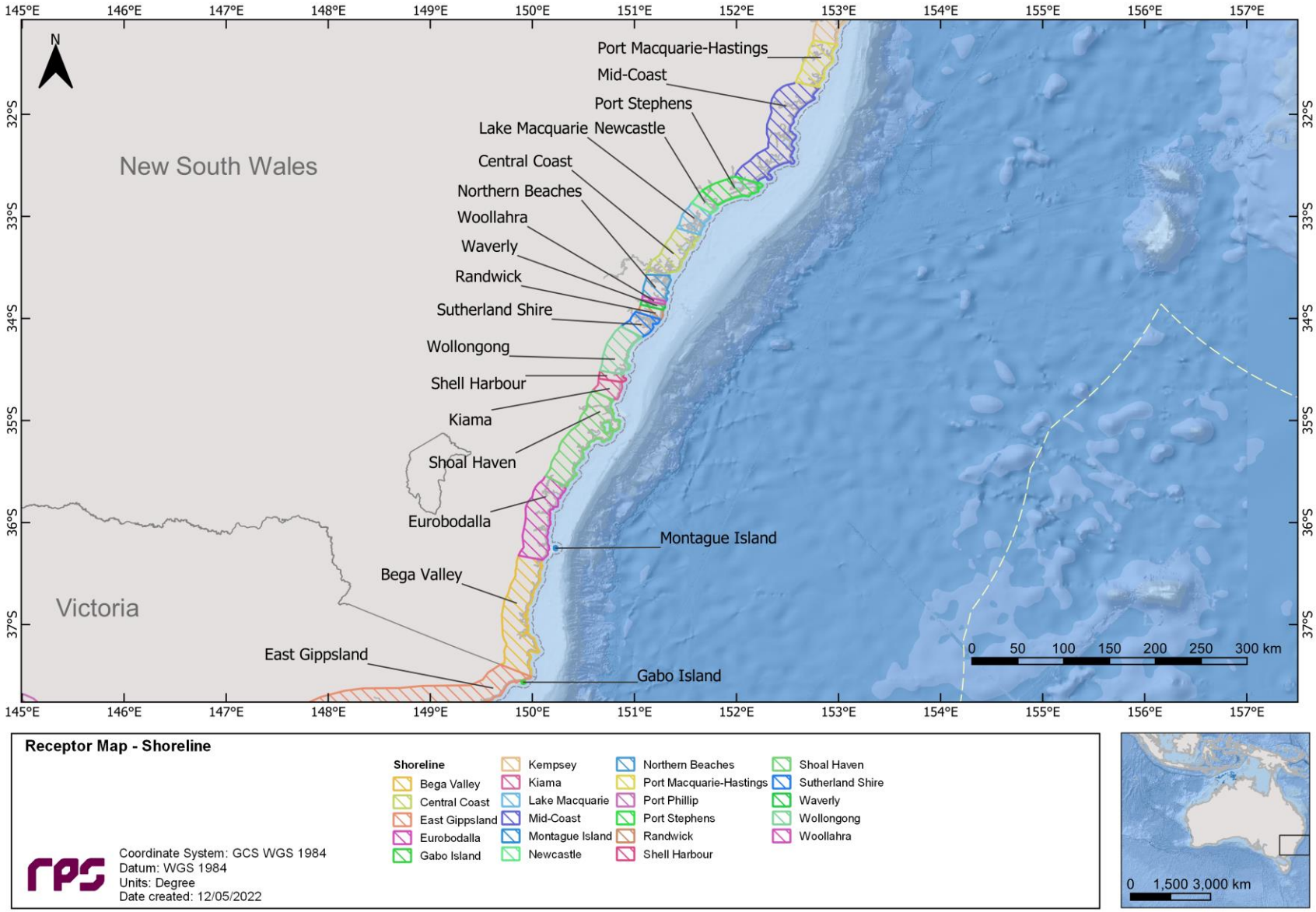


Figure 10.18 Receptor map for shorelines (4 of 4).

11 MODEL SETTINGS

Table 11.1 provides a summary of the spill modelling inputs and thresholds.

The potential risk of exposure to the surrounding waters and contact to shorelines was assessed for summer (October to March) and winter conditions (April to September).

The simulation length was carefully selected based on extensive sensitivity testing. During the sensitivity testing process, sample spill simulations were run for longer than intended durations. Upon completion of the spill simulations, the results were carefully assessed to examine the persistence of the hydrocarbon (i.e. whether the maximum evaporative loss has been achieved for the period modelled; and whether a substantial volume of hydrocarbons remain in the water column (if any)) in conjunction with the extent of floating oil exposure based on reporting thresholds. Once there was agreement between the two factors (i.e. the final fate of hydrocarbon is accounted for, and the full exposure area is identified) the simulation length was deemed appropriate.

Table 11.1 Summary of the of the oil spill modelling inputs and thresholds.

Parameter	Scenario 1 – Vessel collision	Scenario 2 – Subsea LOWC
Number of randomly selected spill start times and per season	100	
Model period	Summer (October to March) and winter conditions (April to September)	
Oil type	MDO	Condensate
Spill release rate	N/A	4,514 bbl/day (717 m^3/day)
Total Spill volume	280 m^3	347,584 bbl (55,256 m^3)
Release type	Surface	Subsea
Release duration	6 hours	77 days
Simulation length	30 days	107 days
Floating oil exposure thresholds (g/m^2)	1 (low exposure) 10 (moderate exposure) 50 (high exposure)	
Shoreline accumulation thresholds (g/m^2)	10 (low exposure) 100 (moderate exposure) 1,000 (high exposure)	
Dissolved hydrocarbon exposure thresholds (ppb)	10 (10 ppb x 1 hr, low exposure) 50 (50 ppb x 1 hr, moderate exposure) 400 (400 ppb x 1 hr, potential high exposure)	
Entrained hydrocarbon exposure thresholds (ppb)	10 (10 ppb x 1 hr, low exposure) 100 (100 ppb x 1 hr, high exposure)	

12 PRESENTATION AND INTERPRETATION OF MODEL RESULTS

The results from the modelling study are presented in a number of tables and figures, which aim to provide an understanding of the predicted sea-surface and water column (subsurface) exposure and shoreline accumulation (if predicted).

12.1 Stochastic Modelling

If readers are not fully familiar with how to interpret stochastic modelling outputs, please refer to the relevant NOPSEMA factsheet (NOPSEMA, 2018) before reading this report section.

Predictions for the probability of contact and time to contact by oil concentrations equalling or exceeding defined thresholds for floating and shoreline oil, entrained oil and dissolved hydrocarbons are provided in the following sections to summarise the stochastic results, which are calculated and presented as follows:

a. ***Areas of Exposure*** - encompasses the entire area that could be exposed and was derived from the seasonal stochastic modelling results (i.e., results from all replicate simulations across all seasons) based on the following thresholds:

   Low Threshold Exposure Area

   i. Floating oil – 1 g/m^2.
   ii. Shoreline oil accumulation – 10 g/m^2.
   iii. Dissolved aromatic hydrocarbon – 10 pb; and
   iv. Entrained hydrocarbons –10 ppb.

   Moderate Threshold Exposure Area

   i. Floating oil – 10 g/m^2.
   ii. Shoreline oil accumulation – 100 g/m^2.
   iii. Dissolved aromatic hydrocarbon – 50 pb; and

   High Threshold Exposure Area

   iv. Floating oil – 50 g/m^2.
   v. Shoreline oil accumulation – 1,000 g/m^2.
   vi. Dissolved aromatic hydrocarbon – 400 pb; and
   vii. Entrained hydrocarbons –100 ppb.

b. ***Seasonal Cross-sections of entrained and dissolved hydrocarbon concentrations*** - The predicted maximum entrained and dissolved hydrocarbon concentrations within the water column, along east-west and north-south transects in the vicinity of the release locations.

c. ***Predicted exposure*** zones – maps of floating oil exposure, shoreline oil accumulation, entrained oil and dissolved hydrocarbons exposure were generated based on the following thresholds:

   i. Floating oil – 1-10 g/m^2 (Low), 10-50 g/m^2 (Moderate) and ≥50 g/m^2 (High).
   ii. Shoreline oil accumulation – 10-100 g/m^2 (Low), 100-1,000 g/m^2 (Moderate) and ≥1,000 g/m^2 (High).
   iii. Entrained hydrocarbons – 10-100 ppb (Low) and ≥100 ppb (High).
   iv. Dissolved hydrocarbon – 10-50 ppb (Low), 50-400 ppb (Moderate) and ≥400 ppb (High).

d. ***The probability of oil exposure on the sea surface, in-water or shorelines*** – is calculated by dividing the number of spill simulations passing over a given grid cell at a given threshold, divided by the total number of simulations.

e. ***The minimum time before oil exposure on the sea surface, in-water or shorelines*** – is determined by ranking the elapsed time before sea surface exposure, entrained oil exposure or shoreline accumulation (at a given threshold) to a given location/grid cell for each of the spill simulations.

f. ***The maximum local accumulated concentration averaged over all replicate spills*** - the greatest concentration calculated for any point on the shoreline after averaging over all replicate simulations.

g. ***The maximum local accumulated concentration in the worst replicate spill*** - the greatest accumulation predicted for any point on the shoreline during any replicate simulation, and thus represents an extreme estimate.

h. ***The average volume of oil ashore*** – is determined by averaging the volume of oil ashore across all simulations predicted to make shoreline contact.

i. ***The maximum volume of oil ashore in the worst replicate spill*** – the greatest volume of oil predicted for any point on the shoreline during any replicate simulation, and thus represents an extreme estimate.

The mean and maximum shoreline concentrations indicate the concentrations forecast to potentially accumulate over time on any discrete part of a shoreline; calculated for individual portions of 1 km in length. Accumulated concentrations are calculated by summing the mass of oil that arrives at any concentration (including < threshold) over time at a model cell and subtracting any mass lost through evaporation and washing off, where relevant.

Note that it is possible that oil films arriving at concentrations that are less than the threshold may accumulate over the course of a spill event to result in concentrations that apparently exceed the threshold. Hence, the mean expected, and maximum concentrations of accumulated oil can exceed the threshold applied to the probability calculations for the arrival of floating oil even where no instantaneous exceedances above threshold are predicted. It is important to understand that the two parameters (floating concentration and shoreline concentration) are quite distinct, calculated in different ways and representative of alternative outcomes. The floating probability estimates, and the shoreline accumulative estimates should therefore be treated as independent estimators of different exposure outcomes, and not directly compared.

Readers should note that the contour maps presented in the stochastic modelling results, do not represent the predicted coverage of any one hydrocarbon spill or a depiction of a slick or plume at any instant in time. Rather, the contours are a composite of many theoretical slick paths, integrated over the full duration of the simulations relevant to each scenario. The stochastic modelling contour maps should be treated as indications of the probability of exposure at defined concentrations, for individual locations, at some point in time after the defined spill commences, given the trends and variations in metocean conditions that occur around the study area.

Locations with higher probability ratings were exposed during a greater number of spill simulations, indicating that the combination of the prevailing wind and current conditions are more likely to result in contact to these locations if the spill scenario were to occur in the future. The areas outside of the lowest-percentage contour indicate that contact will be less likely under the range of prevailing conditions for this region than areas falling within higher probability contours. It is important to note that the probabilities are derived from the samples of data used in the modelling. Therefore, locations that are not calculated to receive exposure at threshold concentrations or greater in any of the replicate simulations might possibly be contacted if very unusual conditions were to occur. Hence, we do not attribute a probability of nil to areas beyond the lowest probability contour.

12.2 Deterministic Modelling

While the stochastic modelling results provide an objective indication of all locations that may be exposed or contacted by oil above the reporting thresholds, the approach describes a larger potential area of influence than can be expected from any one single spill event. To understand the potential area that might be affected during an isolated (single) spill event, it is helpful to analyse the outcomes of individual deterministic cases in more detail for each scenario.

A series of maps have been presented for the deterministic simulations selected:

Maps of the predicted zones of floating oil exposure, in-water exposure (entrained and dissolved) and shoreline accumulation over the entire simulation; and

Weathering and fates graphs.

Additionally, a summary of the volumes for each oil phase and the volumes at the conclusion of the simulation.

13 MODELLING RESULTS: VESSEL COLLISION

The scenario investigated the potential exposure from a 280 m^3 surface release of MDO following a vessel collision. The oil was tracked for 30 days following the release to allow concentrations to decrease below the thresholds. The modelling assumed no mitigation efforts are undertaken to collect or otherwise affect the natural transport and weathering.

Section 13.1.1 presents the areas of exposure, Section 13.2 shows the seasonal (or stochastic) results, while Section 13.3 presents the results for the deterministic simulation.

For the stochastic results, the potential exposure and risk were separately calculated for each receptor and have been tabulated, except for the two receptors that the release location resides within (Twofold Shelf IMCRA and Upwelling East of Eden KEF).

13.1 Stochastic Analysis

13.1.1 Areas of Exposure

Figure 13.1 presents the areas of exposure based on the ‘low’, ‘moderate’ and ‘high’ thresholds derived from all 200 spill simulations.

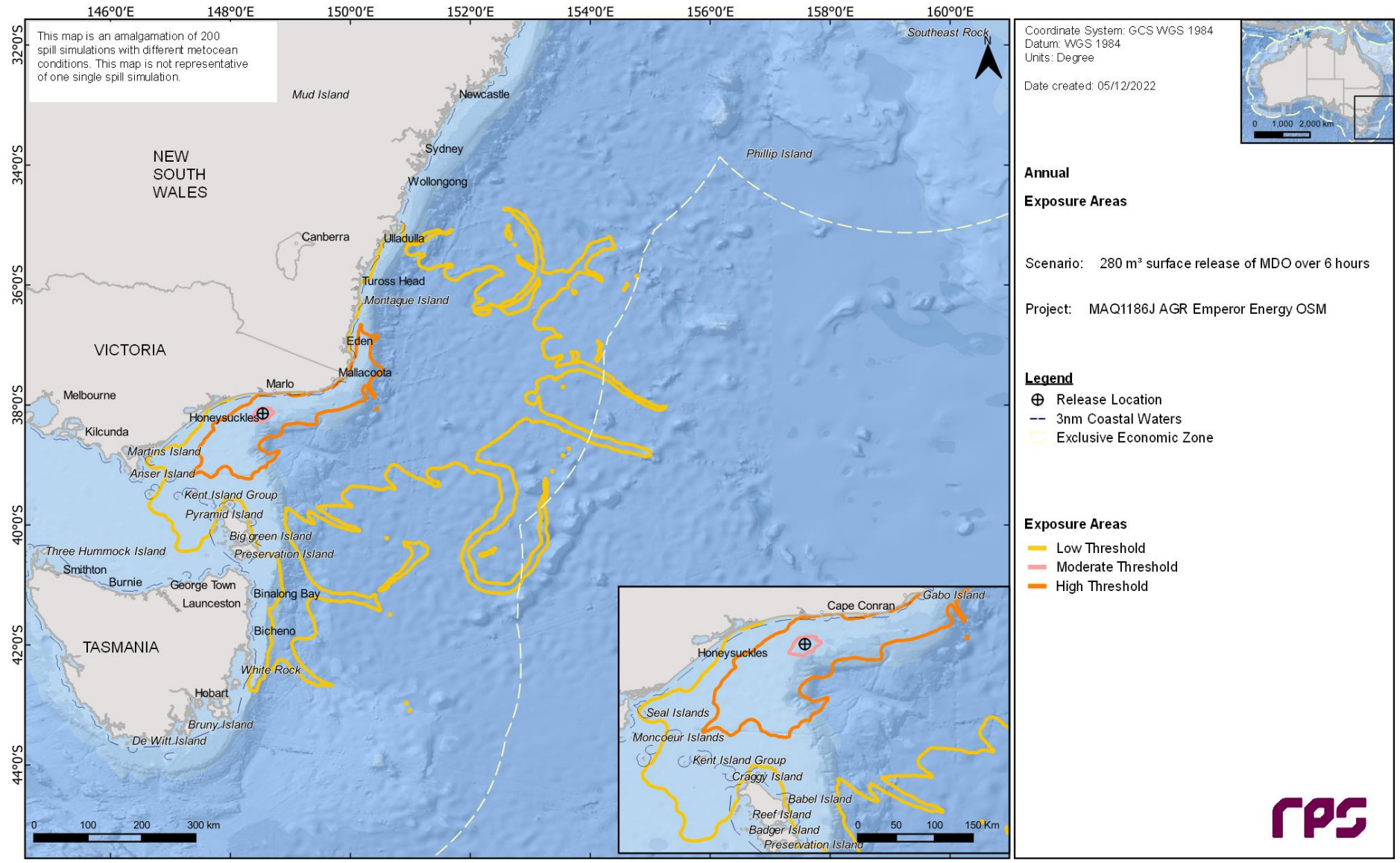


Figure 13.1 Predicted areas of exposure following a vessel collision, derived from all 200 spill simulations.

13.2 Stochastic Analysis

13.2.1 Floating Oil Exposure

Table 13.1 summarises the maximum distances from the release location to floating oil exposure thresholds. Floating oil concentrations exceeding 1 g/m^2 could extend up to 167.3 km from the release location due to a small, isolated patch which had resurfaced near the NSW boarder during a simulation under summer conditions. The distance reduces to 18.7 km as the threshold increases to 10 g/m^2 and 2.9 km as the threshold further increases to the 50 g/m^2.

There was no floating oil exposure predicted for any receptor at any threshold.

Figure 13.2 to Figure 13.3 illustrate the extent of floating oil exposure zones for each season.

Table 13.1 Maximum distances from the release location to floating oil exposure thresholds from a vessel collision for each season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Floating oil exposure thresholds		
		1 g/m^2	10 g/m^2	50 g/m^2
Summer	Maximum distance (km) from release location	167.3	18.7	-
	Maximum distance (km) from release location (99th percentile)	62.4	16.9	-
	Direction	ENE	WSW	-
Winter	Maximum distance (km) from release location	28	15.8	2.9
	Maximum distance (km) from release location (99th percentile)	26.3	15	2.9
	Direction	SSW	SW	NW

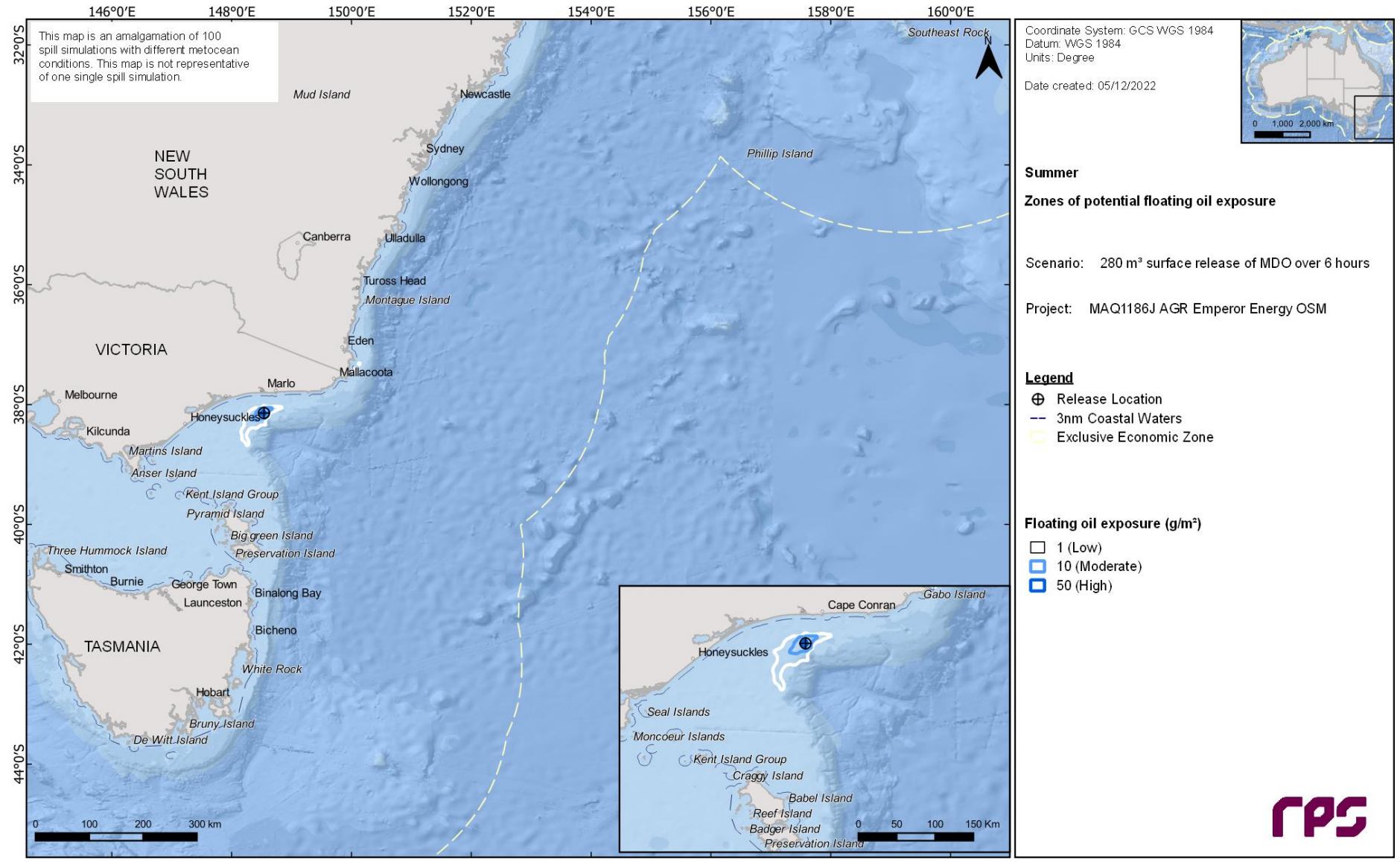


Figure 13.2 Zones of potential floating oil exposure from a vessel collision during summer conditions. The results were calculated from 100 spill simulations.

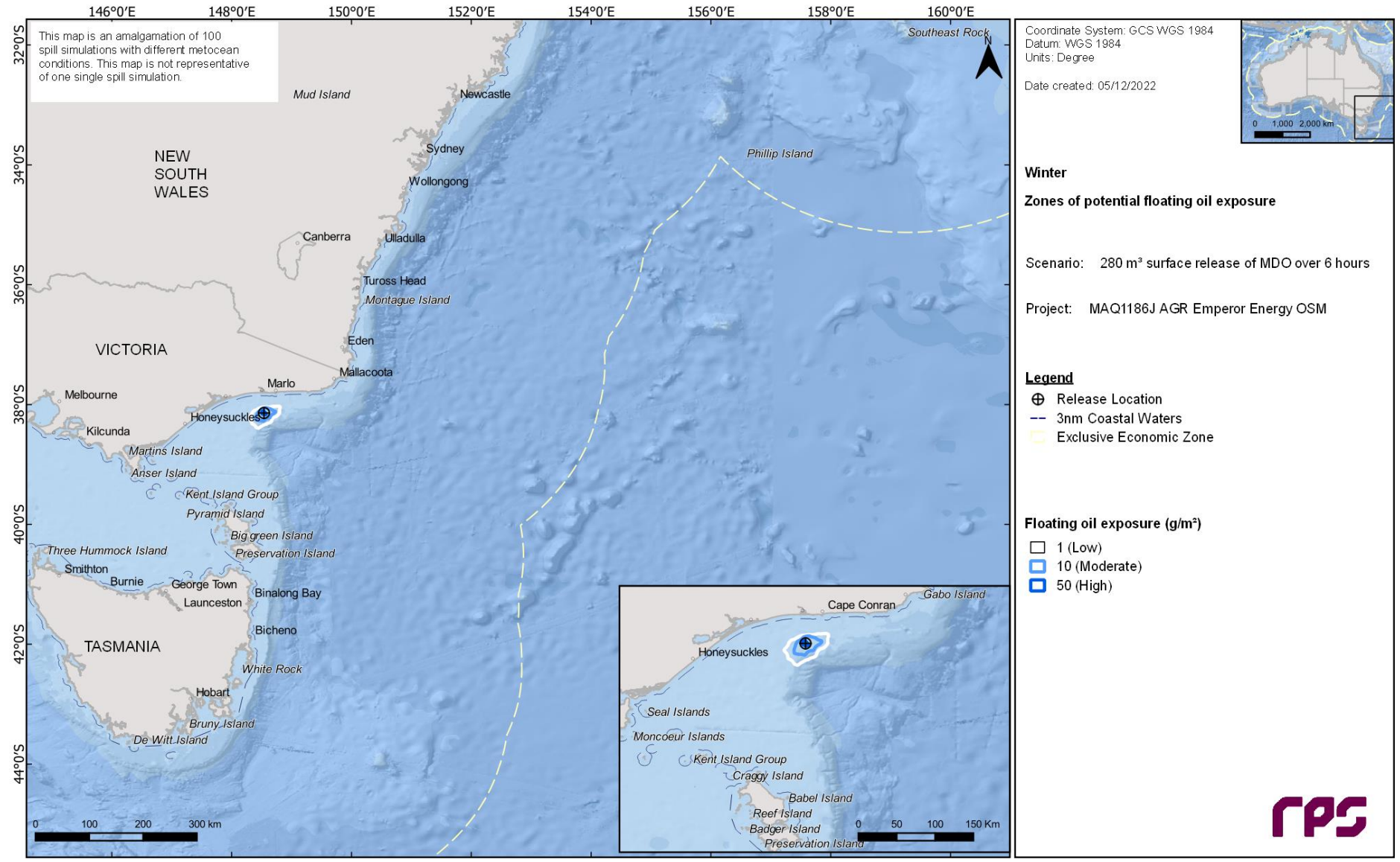


Figure 13.3 Zones of potential floating oil exposure from a vessel collision during winter conditions. The results were calculated from 100 spill simulations.

13.2.2 Shoreline Accumulation

Table 13.2 summarises the predicted oil accumulation on any shoreline during each season. The highest probability of oil accumulation at the 10 g/m^2 threshold was during winter at 12%. The maximum volume ashore was 9.1 m^3.

There was no accumulation predicted for the 1,000 g/m^2 threshold for summer and winter conditions.

Table 13.3 and Table 13.4 summarise the oil accumulation for shoreline sectors presented in Section 10 during each season. The highest probability of oil accumulation at the 10 g/m^2 threshold was forecast for the East Gippsland shoreline (7% during summer and winter conditions). The maximum volume of oil ashore was 9.1 m^3 along the East Gippsland shoreline.

The quickest time before oil had accumulated on shorelines at the 10 g/m^2 threshold was 3.25 days predicted for the East Gippsland coastline under summer conditions.

The maximum potential shoreline loading for each season are presented in Figure 13.4 and Figure 13.5.

Table 13.2 Summary of oil accumulation on any shoreline from a vessel collision during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the 10 g/m^2 threshold	11	12
Absolute minimum time before oil ashore (days) at or above the 10 g/m^2 threshold	3.3	3.6
Maximum volume of hydrocarbons ashore (m^3)	1.8	9.1
Average volume of hydrocarbons ashore (m^3)	0.7	2.1
Maximum length of the shoreline at **10 g/m^2** (km)	4	23
Average shoreline length (km) at **10 g/m^2** (km)	1.9	5.7
Maximum length of the shoreline at **100 g/m^2** (km)	-	1
Average shoreline length (km) at **100 g/m^2** (km)	-	1
Maximum length of the shoreline at **1,000 g/m^2** (km)	-	-
Average shoreline length (km) at **1,000 g/m^2** (km)	-	-

Table 13.3 Summary of oil accumulation for shoreline sectors from a vessel collision during summer conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%) at			Minimum time before shoreline accumulation (days) at			Load on shoreline (g/m²)		Volume on shoreline (m³)		Mean length of shoreline accumulation (km) at			Maximum length of shoreline accumulation (km) at		
	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	Mean	Peak	Mean	Peak	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²
Babel Island	1	-	-	14.08	-	-	13	13	0.2	0.2	0.9	-	-	0.9	-	-
Bega Valley	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
East Gippsland	7	-	-	3.25	-	-	< 1	45	0.5	1.8	1.8	-	-	3.6	-	-
Gabo Island	1	-	-	4.04	-	-	18	18	0.3	0.3	0.9	-	-	0.9	-	-
Kent Island Group	2	-	-	9.46	-	-	< 1	17	0.1	0.9	2.2	-	-	3.6	-	-
Shoal Haven	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 13.4 Summary of oil accumulation for shoreline sectors from a vessel collision during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%) at			Minimum time before shoreline accumulation (days) at			Load on shoreline (g/m²)		Volume on shoreline (m³)		Mean length of shoreline accumulation (km) at			Maximum length of shoreline accumulation (km) at		
	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	Mean	Peak	Mean	Peak	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²
Babel Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bega Valley	2	-	-	3.75	-	-	< 1	46	0.2	1.2	2.2	-	-	3.6	-	-
East Gippsland	7	1	-	3.58	5.17	-	3	351	1.7	9.1	6.7	0.9	-	20.7	0.9	-
Gabo Island	4	-	-	3.83	-	-	3	19	0.1	0.4	1.1	-	-	1.8	-	-
Kent Island Group	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shoal Haven	1	-	-	7.13	-	-	38	38	1.8	1.8	5.4	-	-	5.4	-	-

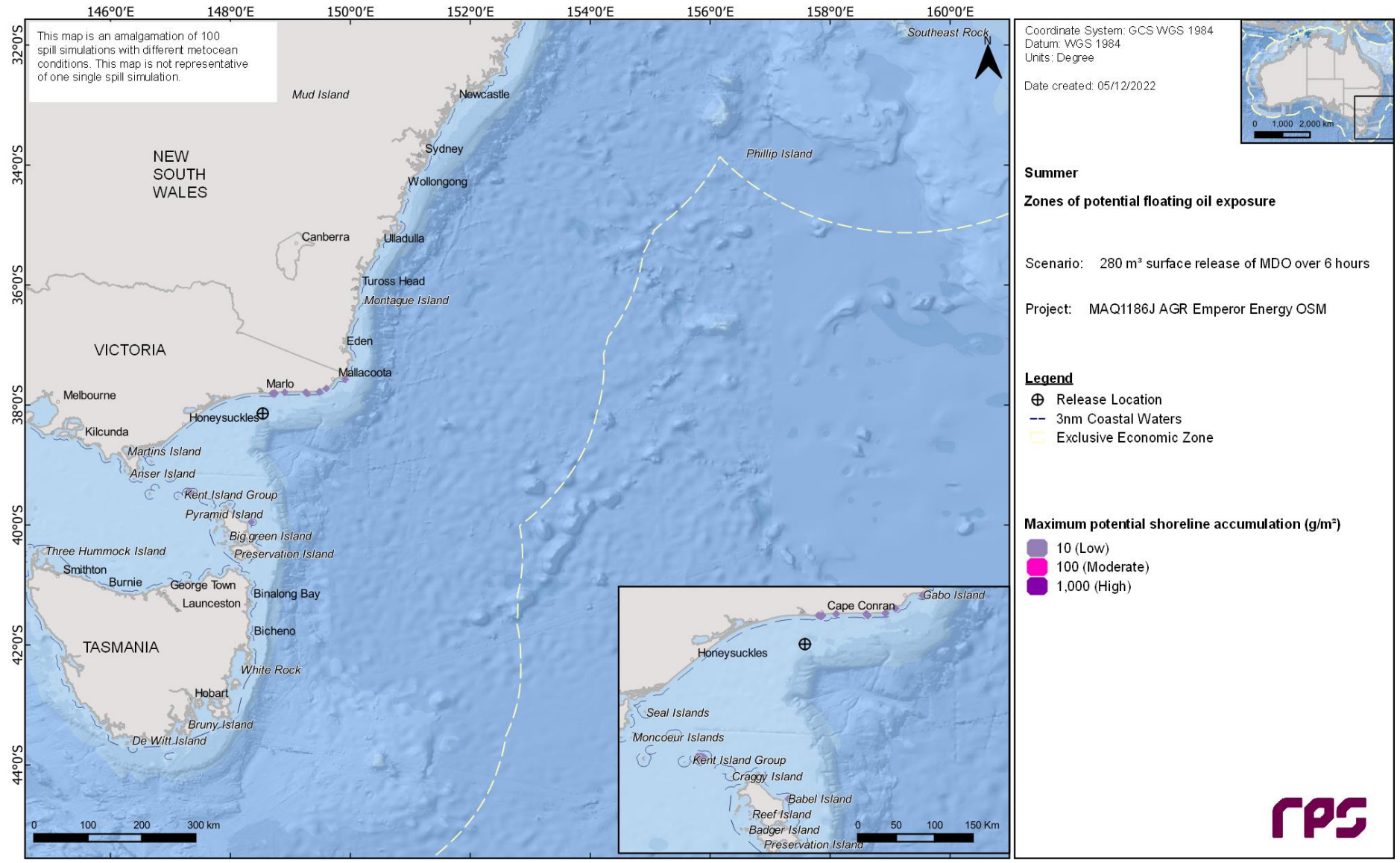


Figure 13.4 Maximum potential shoreline loading from a vessel collision during summer conditions. The results were calculated from 100 spill simulations.

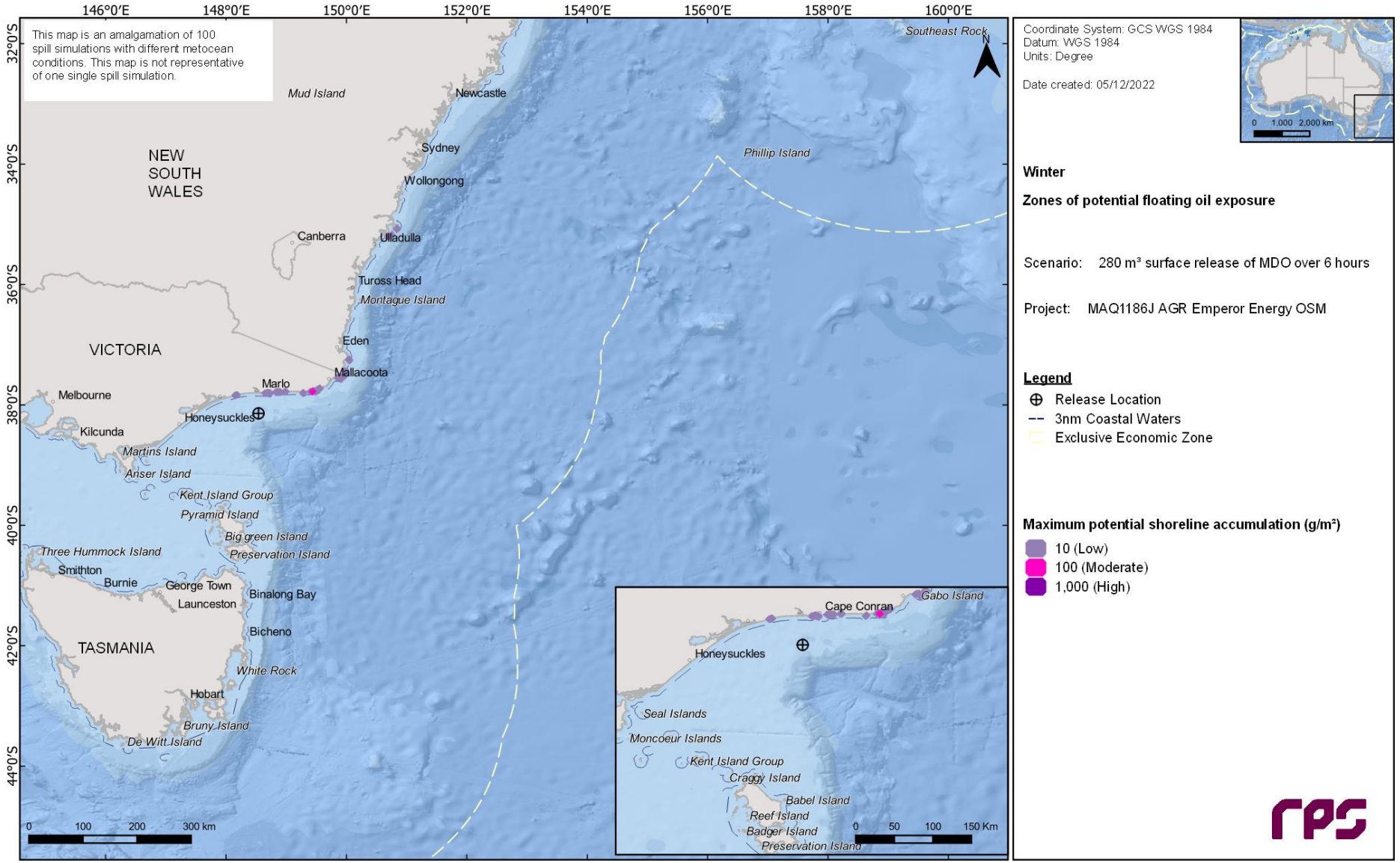


Figure 13.5 Maximum potential shoreline loading from a vessel collision during winter conditions. The results were calculated from 100 spill simulations.

13.2.3 In-water exposure

13.2.3.1 Dissolved Hydrocarbons

Table 13.5 summarises the maximum distances from the release location to dissolved hydrocarbons exposure thresholds in the 0 – 10 m depth layer. Concentrations exceeding 10 ppb may potentially occur 177.4 km from the release location with the distance reducing to 3.1 km as the exposure threshold increases to 50 ppb for winter conditions only. There was no dissolved hydrocarbon concentrations exceeding 400 ppb during summer and winter conditions.

Table 13.6 summarises the predicted exposure to receptors for each season. During summer months, exposure based on the 10 ppb threshold was only predicted for Victorian State waters (1% probability), occurring after 3.13 days. For winter conditions, a 1% probability of exposure was forecast for the New Zealand Star Bank and NSW State waters, after 2.50 days and 2.63 days, respectively.

The highest concentration was predicted at New Zealand Star Bank at 13 ppb. Hence, there was no exposure predicted for any receptor at the 50 ppb and 400 ppb thresholds.

Figure 13.6 and Figure 13.7 present the dissolved hydrocarbon exposure zones during summer and winter, respectively.

Cross-sectional transects (north-south and east-west) of the maximum dissolved hydrocarbons in the vicinity of the release site are presented in Figure 13.8 to Figure 13.11. The dissolved hydrocarbons above 10 ppb were shown to occur to a depth of 25 m.

Table 13.5 Maximum distances from the release location to dissolved hydrocarbon exposure thresholds from a vessel collision during each season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Dissolved hydrocarbon exposure thresholds		
		10 ppb	50 ppb	400 ppb
Summer	Maximum distance (km) from release location	151.8	-	-
	Maximum distance (km) from release location (99th percentile)	118.4	-	-
	Direction	ENE	N	-
Winter	Maximum distance (km) from release location	177.4	3.1	-
	Maximum distance (km) from release location (99th percentile)	126.4	3.1	-
	Direction	ENE	ENE	-

Table 13.6 **Summary of the dissolved hydrocarbon exposure to receptors from a vessel collision during each season. Results were calculated from 100 spill simulations per season.**

Receptors		Summer							Winter						
		Highest dissolved concentration (ppb)	Probability (%) dissolved hydrocarbon exposure at			Minimum time (days) before dissolved hydrocarbon exposure at			Highest dissolved concentration (ppb)	Probability (%) dissolved hydrocarbon exposure at			Minimum time (days) before dissolved hydrocarbon exposure at		
Type	Name		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb
RSB	New Zealand Star Bank	4	-	-	-	-	-	-	13	1	-	-	2.50	-	-
State Waters	New South Wales	6	-	-	-	3.58	-	-	12	1	-	-	2.63	-	-
	Victoria	11	1	-	-	3.13	-	-	-	-	-	-	-	-	-

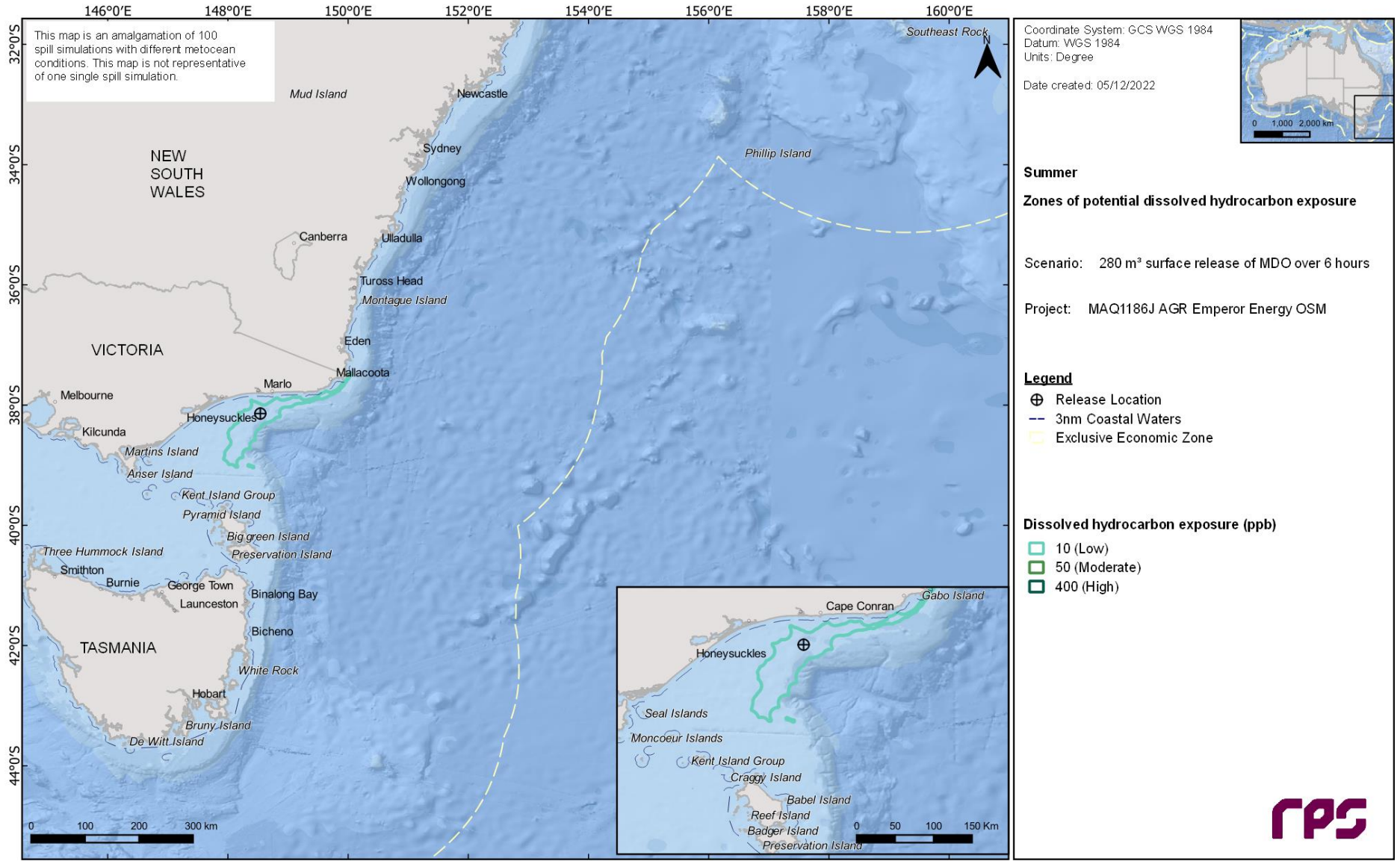


Figure 13.6 Predicted zones of dissolved hydrocarbon exposure from a vessel collision during summer conditions. The results were calculated from 100 spill simulations.

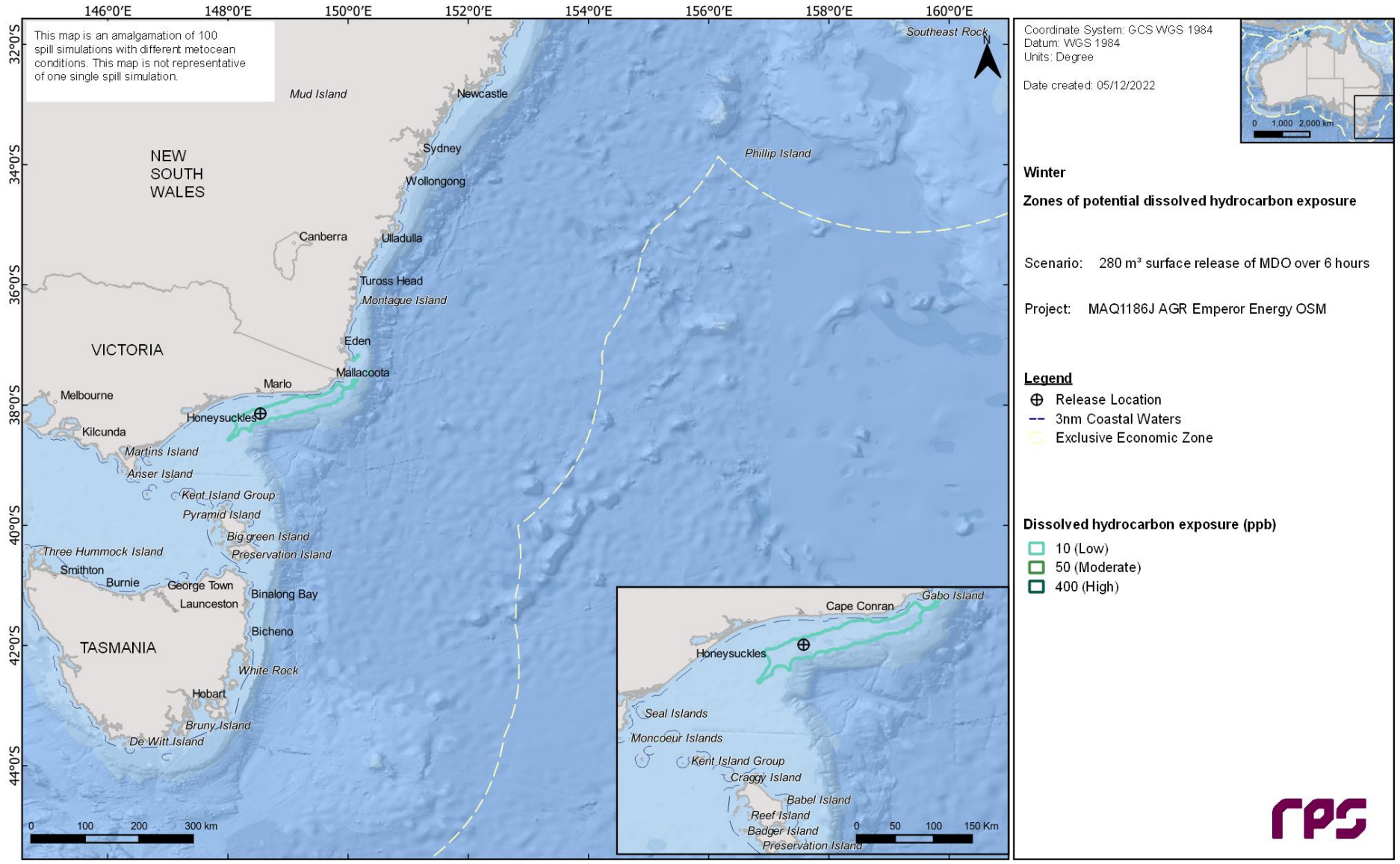


Figure 13.7 Predicted zones of dissolved hydrocarbon exposure from a vessel collision during winter conditions. The results were calculated from 100 spill simulations.

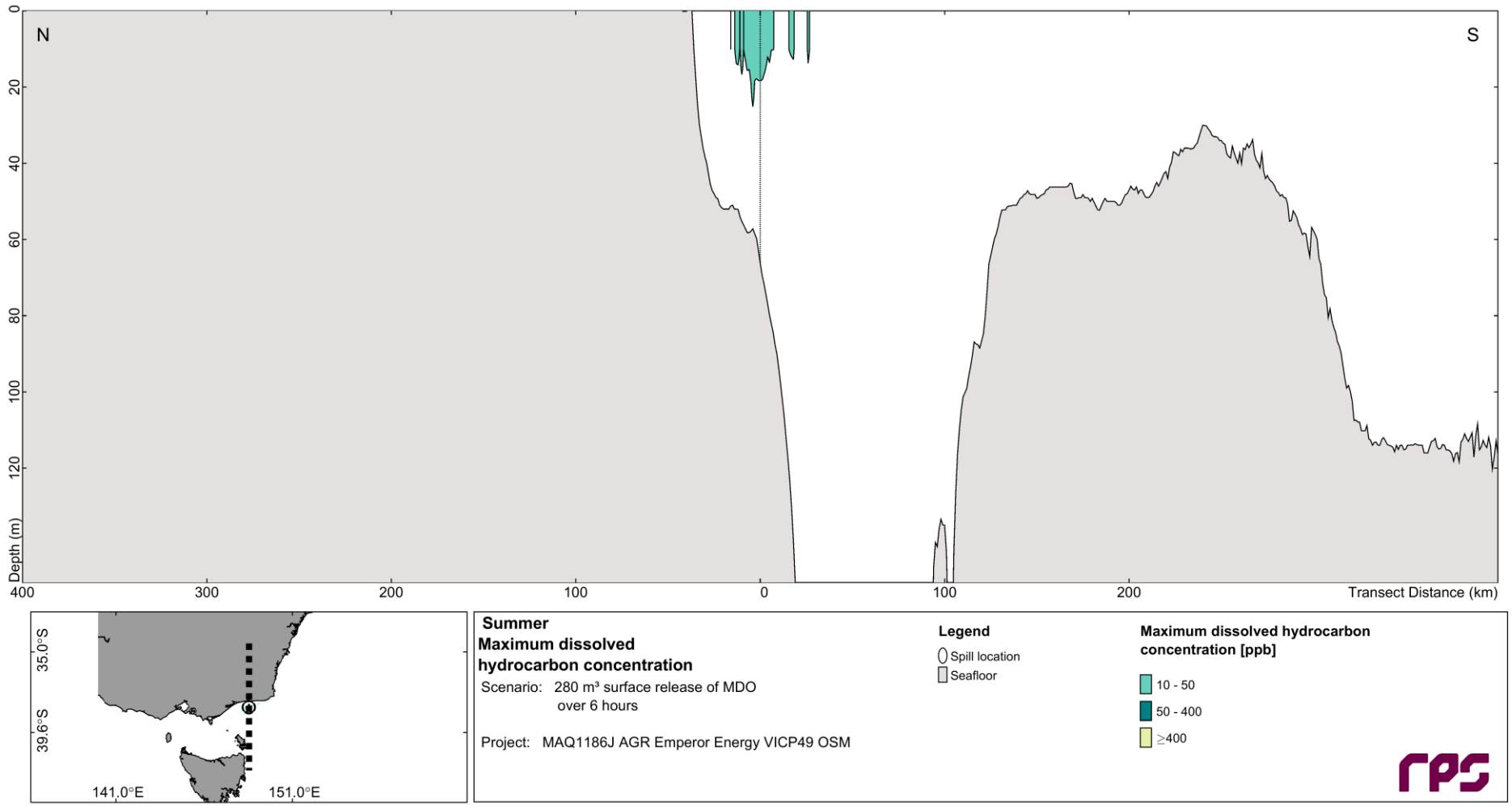


Figure 13.8 North-south cross-section transect of dissolved hydrocarbon concentrations from a vessel collision during summer conditions. The results were calculated from 100 spill simulations.

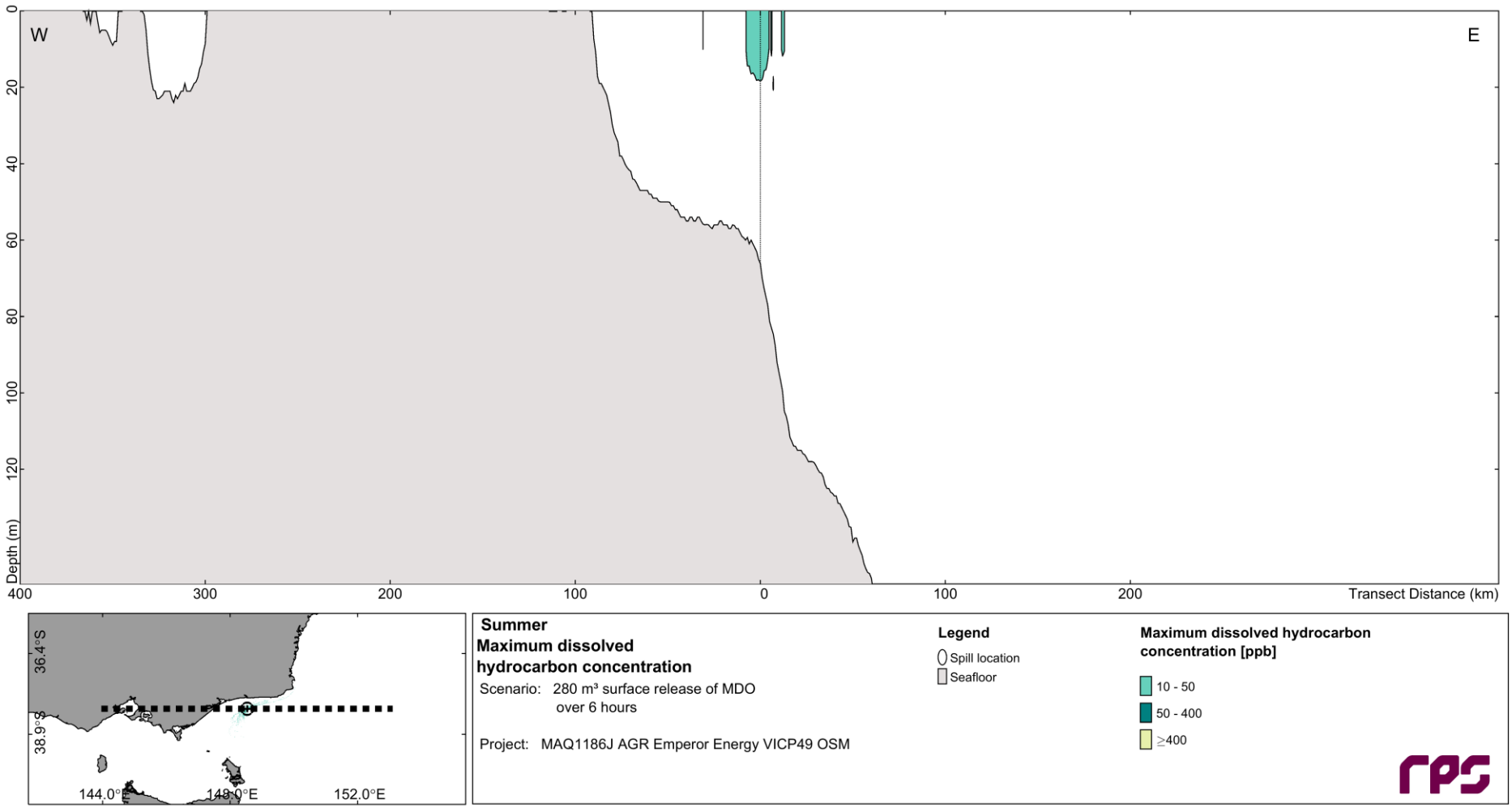


Figure 13.9 East-west cross-section transect of dissolved hydrocarbon concentrations from a vessel collision during summer conditions. The results were calculated from 100 spill simulations.

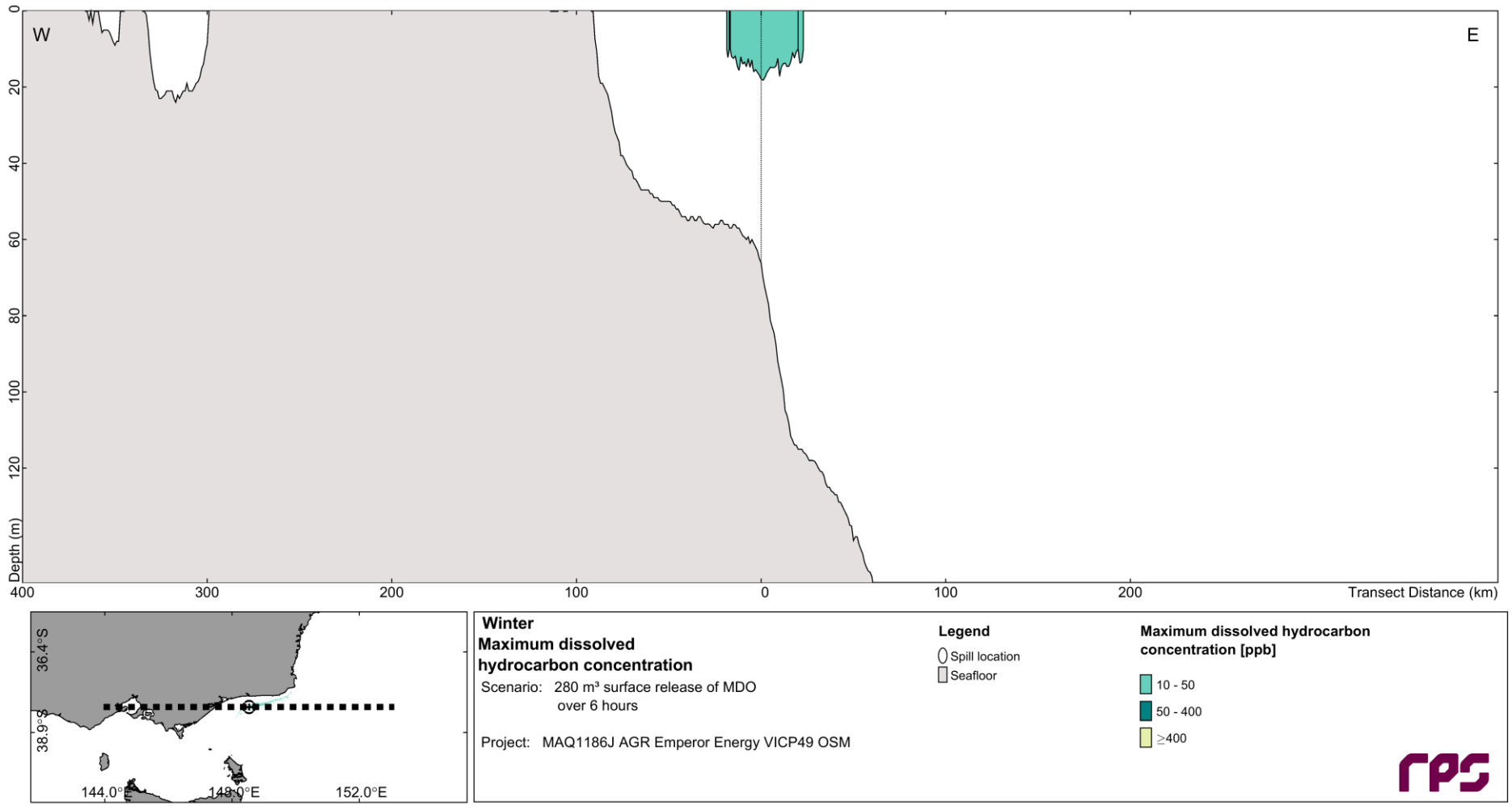


Figure 13.10 North-south cross-section transect of dissolved hydrocarbon concentrations from a vessel collision during winter conditions. The results were calculated from 100 spill simulations.

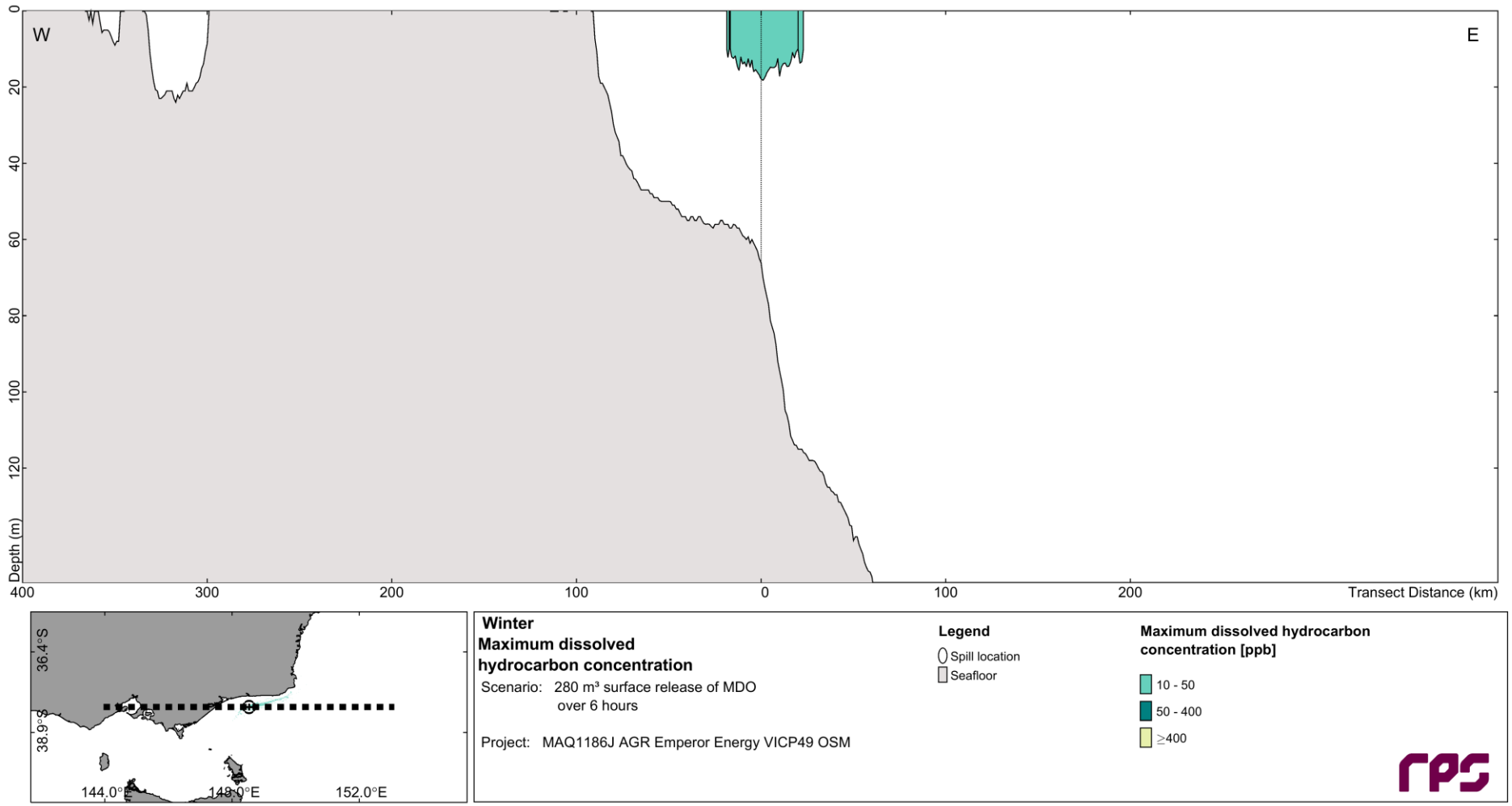


Figure 13.11 East-west cross-section transect of dissolved hydrocarbon concentrations from a vessel collision during winter conditions. The results were calculated from 100 spill simulations.

13.2.3.2 Entrained Hydrocarbons

Table 13.7 summarises the maximum distances from the release location to entrained hydrocarbon thresholds within the 0-10 m depth layer, for each season. Concentrations exceeding 10 ppb may potentially occur 610.9 km from the release location, with the distance reducing to 221.2 km as the threshold increases to 100 ppb.

Table 13.8 summarises the predicted exposure to receptors for each season. The probability of exposure was greatest at the New Zealand Star Bank (26% for summer and 39% for winter conditions) for concentrations equal to or greater than 10 ppb. The same receptor recorded the greatest probability of exposure for concentrations exceeding 100 ppb, 9% for summer and winter conditions. The quickest time before exposure at or above 10 ppb was 1.21 days and 0.88 days for the New Zealand Star Bank during summer and winter conditions, respectively.

The highest concentration of entrained hydrocarbons was predicted at the Big Horseshoe Canyon KEF at 496 ppb during winter.

Figure 13.12 and Figure 13.13 present the entrained hydrocarbon exposure zones during summer and winter, respectively.

Cross-sectional transects (north-south and east-west) of the maximum entrained hydrocarbons in the vicinity of the release site for each season, are presented in Figure 13.14 to Figure 13.17. The entrained hydrocarbons above 10 ppb were shown to occur to a depth of 25 m.

Table 13.7 Maximum distances from the release location to entrained hydrocarbon exposure thresholds in the 0-10 m depth layer from a vessel collision during each season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Entrained hydrocarbon exposure thresholds	
		10 ppb	100 ppb
Summer	Maximum distance (km) from release location	588.5	191.2
	Maximum distance (km) from release location (99th percentile)	490.2	171.4
	Direction	E	ENE
Winter	Maximum distance (km) from release location	610.9	221.2
	Maximum distance (km) from release location (99th percentile)	542.8	205.5
	Direction	ENE	NE

Table 13.8 Summary of the entrained hydrocarbon exposure to receptors from a vessel collision during each season. Results were calculated from 100 spill simulations per season.

Receptors		Summer					Winter				
		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at	
Type	Name		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb
AMP	Beagle	95	12	-	5.42	-	2	-	-	-	-
	East Gippsland	106	7	1	3.13	3.25	126	11	1	2.96	3.17
	Flinders	37	4	-	8.83	-	10	-	-	-	-
	Freycinet	24	3	-	13.54	-	6	-	-	-	-
	Jervis	1	-	-	-	-	13	1	-	11.92	-
IMCRA	Batemans Shelf	47	2	-	7.25	-	104	16	1	3.00	3.08
	Central Bass Strait	29	5	-	10.71	-	-	-	-	-	-
	Flinders	88	8	-	6.29	-	27	3	-	-	-
	Freycinet	13	1	-	20.92	-	1	-	-	-	-
KEF	Big Horseshoe Canyon	122	13	2	3.25	3.88	496	22	3	1.33	1.50
	Canyons on the eastern continental slope	56	3	-	7.21	-	59	3	-	4.63	-
	Seamounts South and east of Tasmania	11	1	-	14.21	-	2	-	-	-	-
	Shelf rocky reefs	2	-	-	-	-	47	4	-	3.92	-
MNP	Cape Howe	219	14	1	1.75	2.17	201	25	2	1.92	2.63
	Point Hicks	317	21	5	1.54	1.58	188	19	2	2.00	2.54

Receptors		Summer					Winter				
		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at	
Type	Name		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb
MP	Batemans	2	-	-	-	-	75	4	-	3.96	-
	Jervis Bay	-	-	-	-	-	26	1	-	6.42	-
MS	Beware Reef	173	4	1	3.42	3.54	61	3	-	2.63	-
NP	Kent Group	68	11	-	6.08	-	2	-	-	-	-
RSB	Beware Reef	175	5	1	3.42	3.54	61	3	-	2.63	-
	Endeavour Reef	16	3	-	10.38	-	1	0	-	-	-
	New Zealand Star Bank	339	26	9	1.21	1.33	324	39	9	0.88	1.71
	Wakitipu Rock	30	6	-	9.38	-	1	-	-	-	-
	Warrego Rock	15	3	-	12.00	-	-	-	-	-	-
	Wright Rock	17	5	-	10.38	-	1	-	-	-	-
Nearshore waters	Babel Island	21	1	-	10.67	-	1	-	-	-	-
	Bega Valley	73	6	-	2.33	-	131	11	2	2.29	2.75
	Cape Barren Osland	14	1	-	16.50	-	-	-	-	-	-
	Craggy Island	10	1	-	16.46	-	-	-	-	-	-
	East Gippsland	138	13	1	2.25	3.42	206	12	2	2.46	2.75
	Eurobodalla	1	-	-	-	-	14	1	-	1-	-
	Flinders Island	11	1	-	20.96	-	-	-	-	-	-

Receptors		Summer					Winter				
		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at	
Type	Name		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb
	Gabo Island	183	9	1	3.71	3.83	111	14	1	2.54	2.63
	Hogan Island Group	22	2	-	10.71	-	1	-	-	-	-
	Inner Sister Island	10	1	-	21.17	-	-	-	-	-	-
	Kent Island Group	79	9	-	6.29	-	2	-	-	-	-
	Montague Island	2	-	-	-	-	47	2	-	4.17	-
	Pyramid Island	37	7	-	8.38	-	1	-	-	-	-
	Seal Islands	14	1	-	16.88	-	-	-	-	-	-
	Shoal Haven	-	0	-	-	-	26	1	-	6.46	-
	Wellington	10	1	-	13.71	-	2	-	-	-	-
State waters	New South Wales	217	11	1	2.21	2.25	194	21	1	1.96	2.29
	Tasmania	84	11	-	5.83	-	3	-	-	-	-
	Victoria	429	23	6	1.50	1.54	244	25	4	1.75	2.08

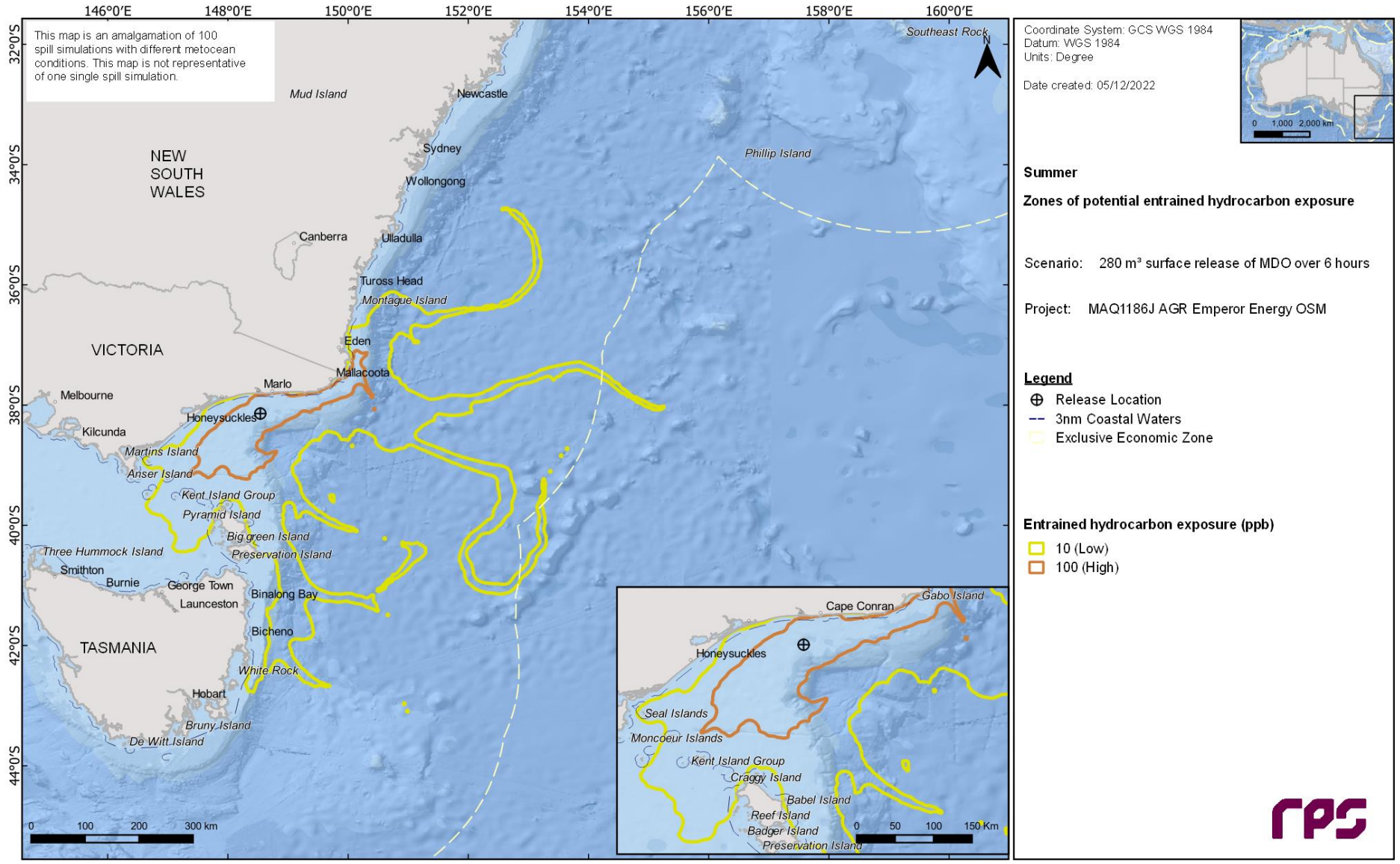


Figure 13.12 Predicted zones of entrained hydrocarbon exposure from a vessel collision during summer conditions. The results were calculated from 100 spill simulations.

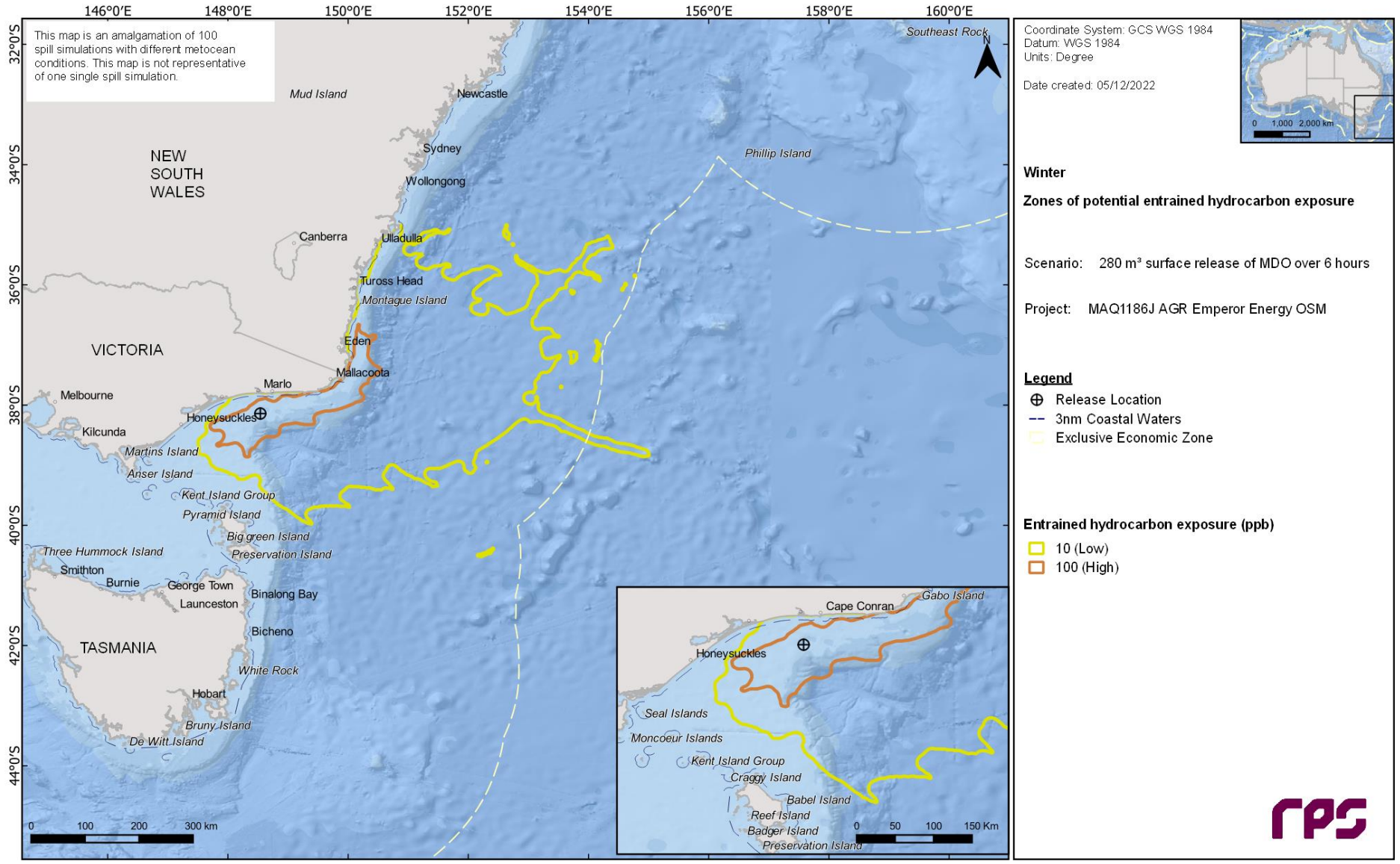


Figure 13.13 Predicted zones of entrained hydrocarbon exposure from a vessel collision during winter conditions. The results were calculated from 100 spill simulations.

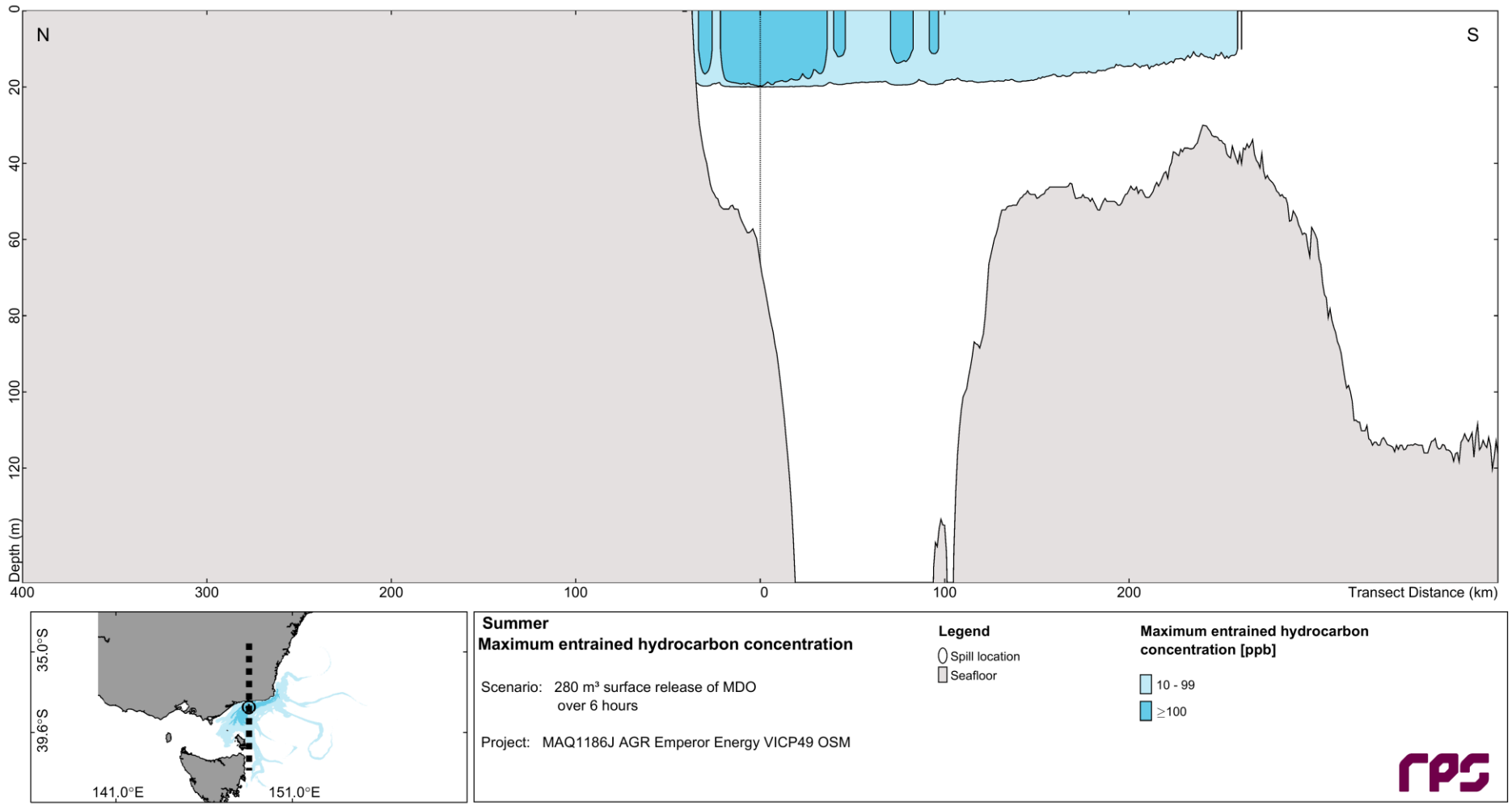


Figure 13.14 North-south cross-section transect of entrained hydrocarbon concentrations from a vessel collision during summer conditions. The results were calculated from 100 spill simulations.

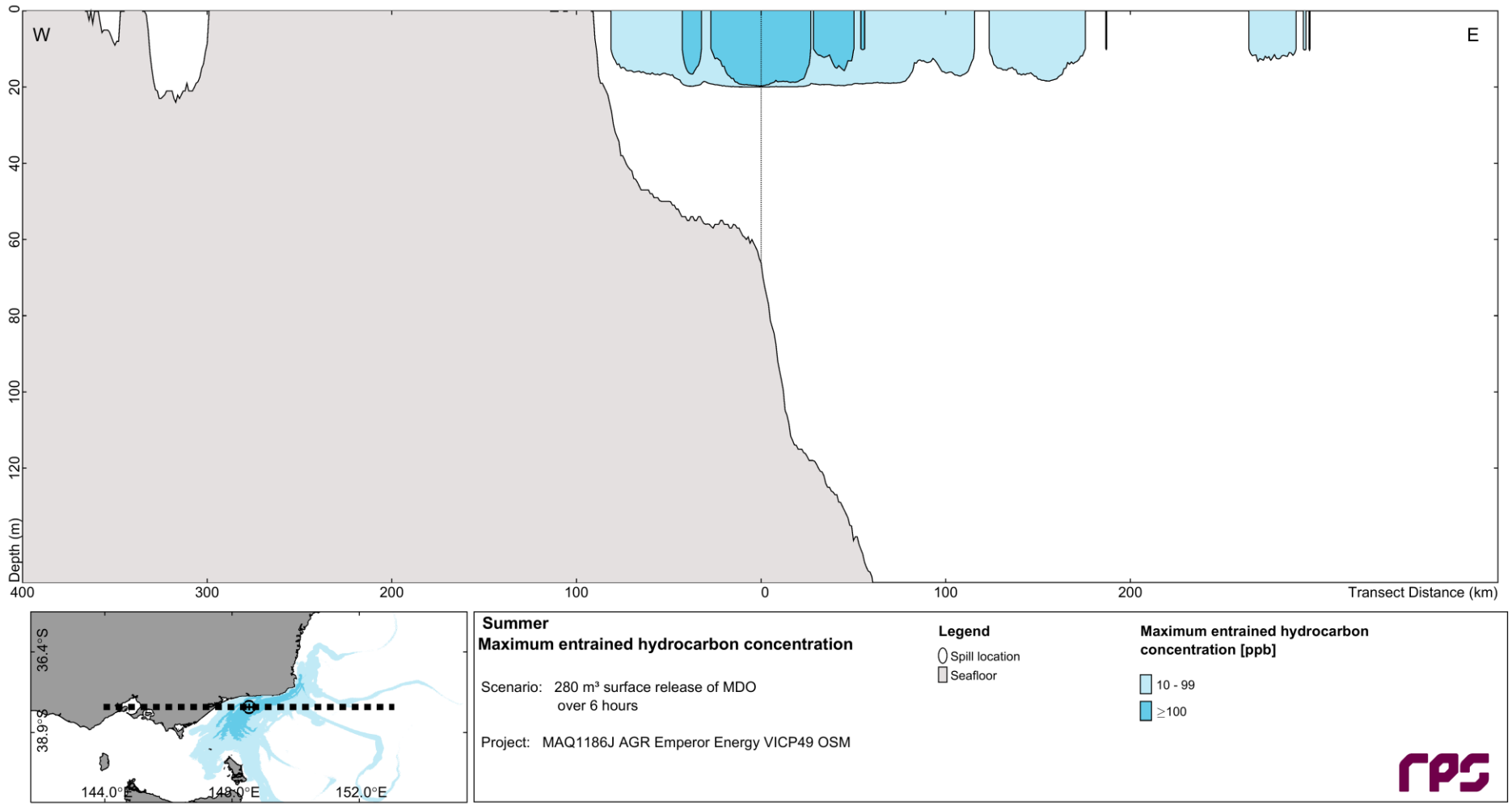


Figure 13.15 East-west cross-section transect of entrained hydrocarbon concentrations from a vessel collision during summer conditions. The results were calculated from 100 spill simulations.

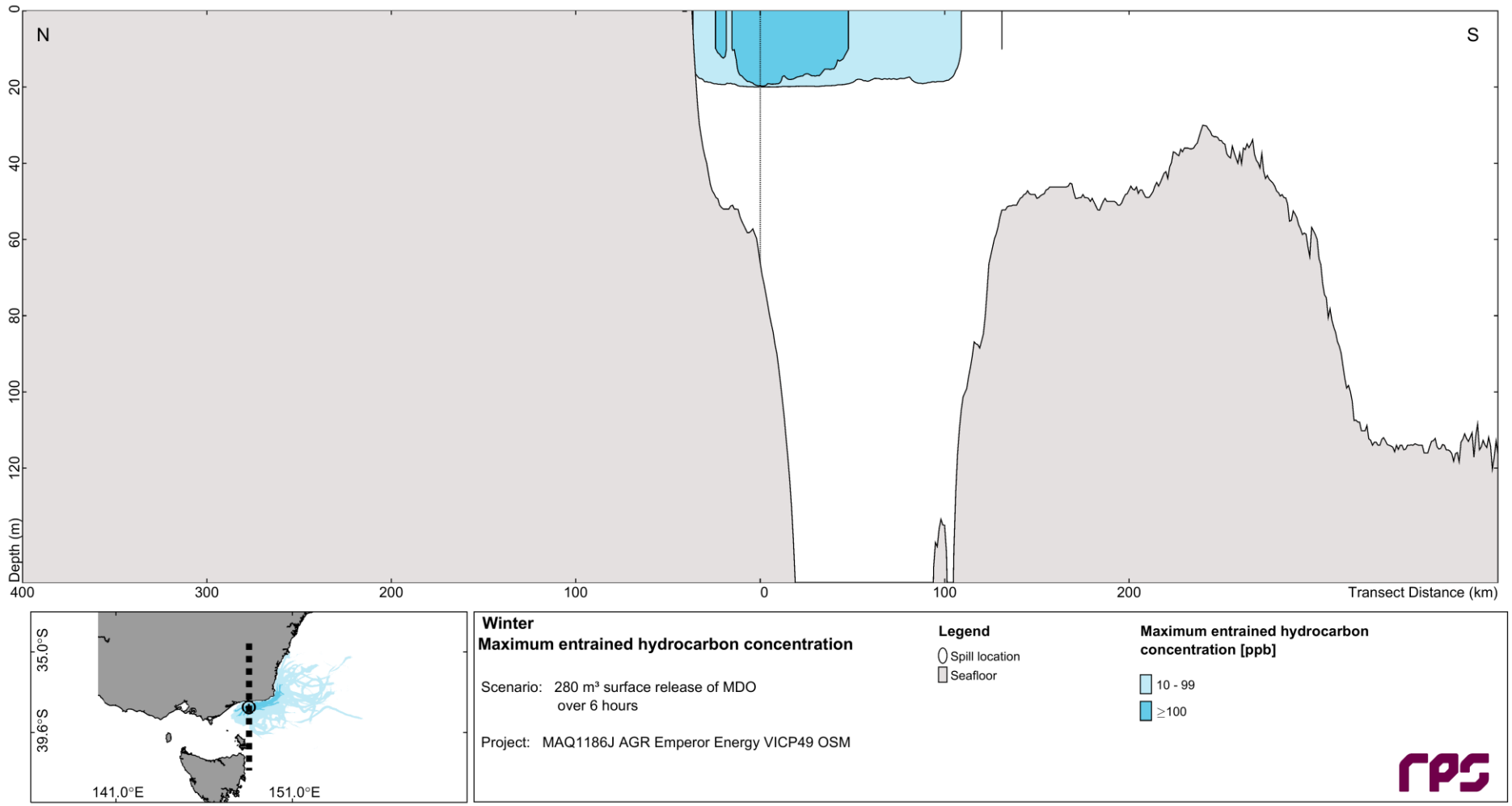


Figure 13.16 North-south cross-section transect of entrained hydrocarbon concentrations from a vessel collision during winter conditions. The results were calculated from 100 spill simulations.

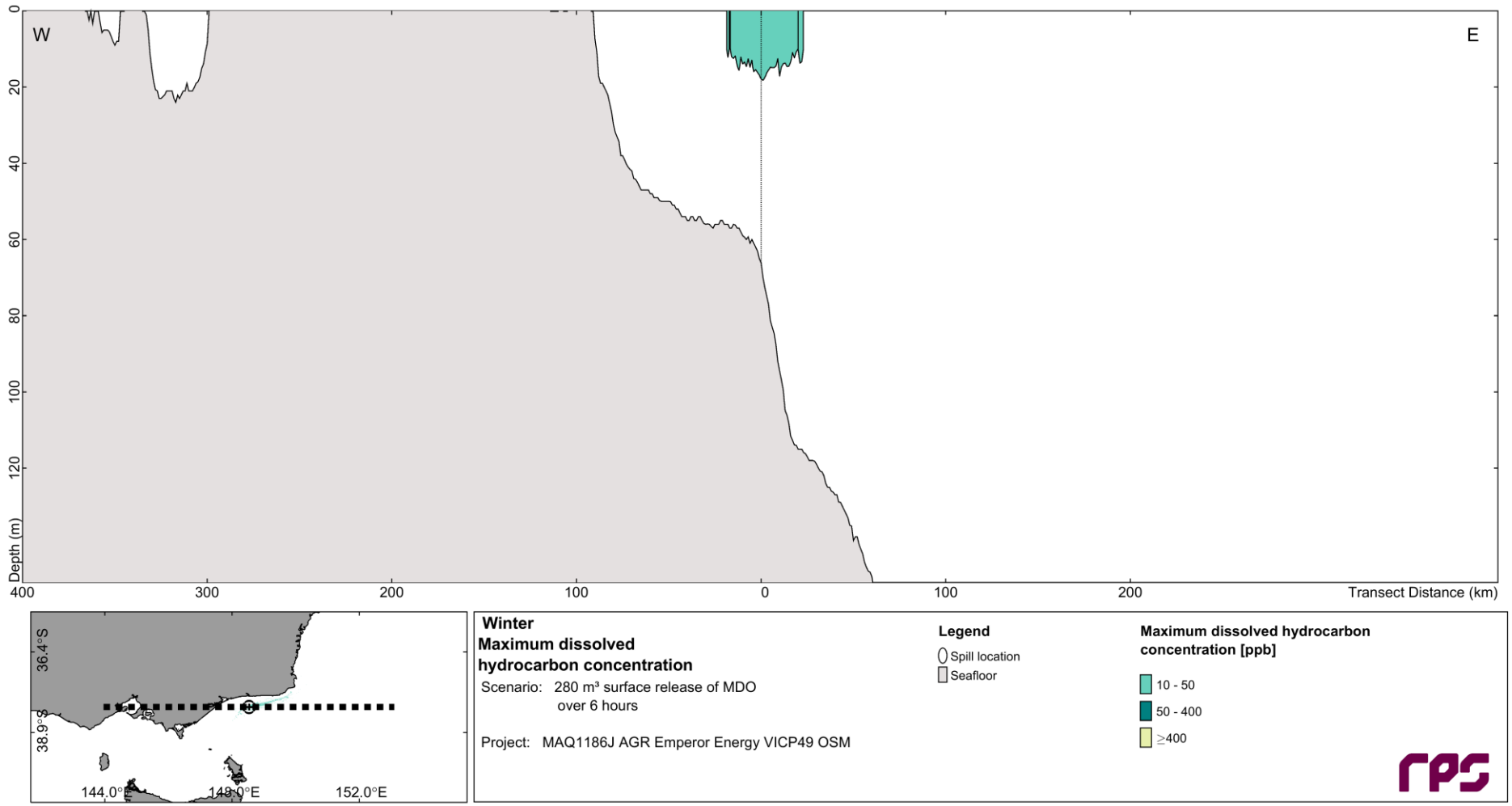


Figure 13.17 East-west cross-section transect of entrained hydrocarbon concentrations from a vessel collision during winter conditions. The results were calculated from 100 spill simulations.

13.3 Deterministic Analysis

The simulation that resulted in the largest volume of hydrocarbons ashore of 9.1 m^3 was identified as run number 35 and commenced during winter conditions, 5 pm 8th May 2018.

Figure 13.18 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (30 days). Initial shoreline accumulation occurred on day 8.

The extent of the predicted entrained hydrocarbon exposure zones in the 0–10 m depth layer over the entire 30 day simulation is presented in Figure 13.19. There was no dissolved hydrocarbon concentrations above 10 ppb.

Figure 13.20 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-30), approximately 142.7 m^3 (~51%) was lost to the atmosphere through evaporation. Approximately, 75.9 m^3 (~27%) of the released volume decayed, while approximately 56.8 m^3 (~20%) was predicted to remain within the water column and approximately 4.2 m^3 (~1%) was present on the shorelines.

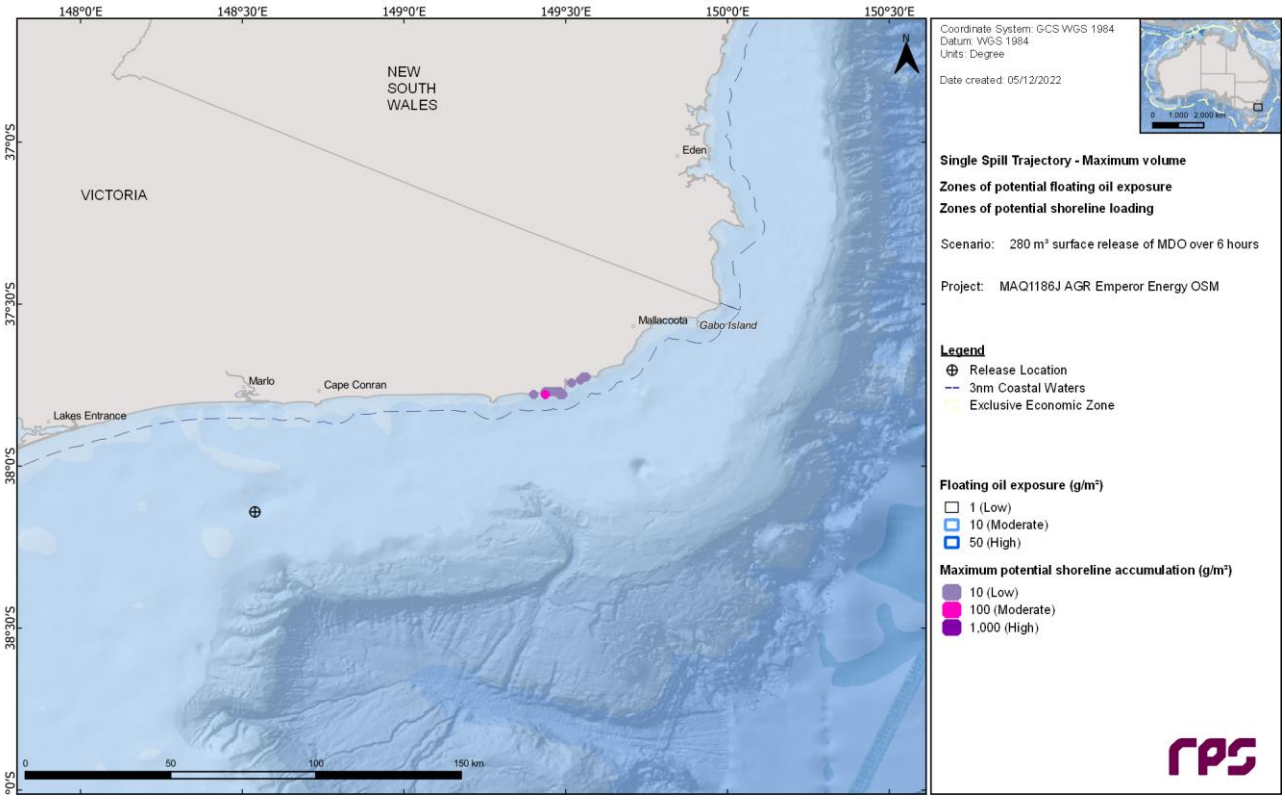


Figure 13.18 Predicted extent of the floating oil exposure and shoreline loading over the entire 30 days for the simulation that led to the largest volume of oil ashore from a vessel collision.

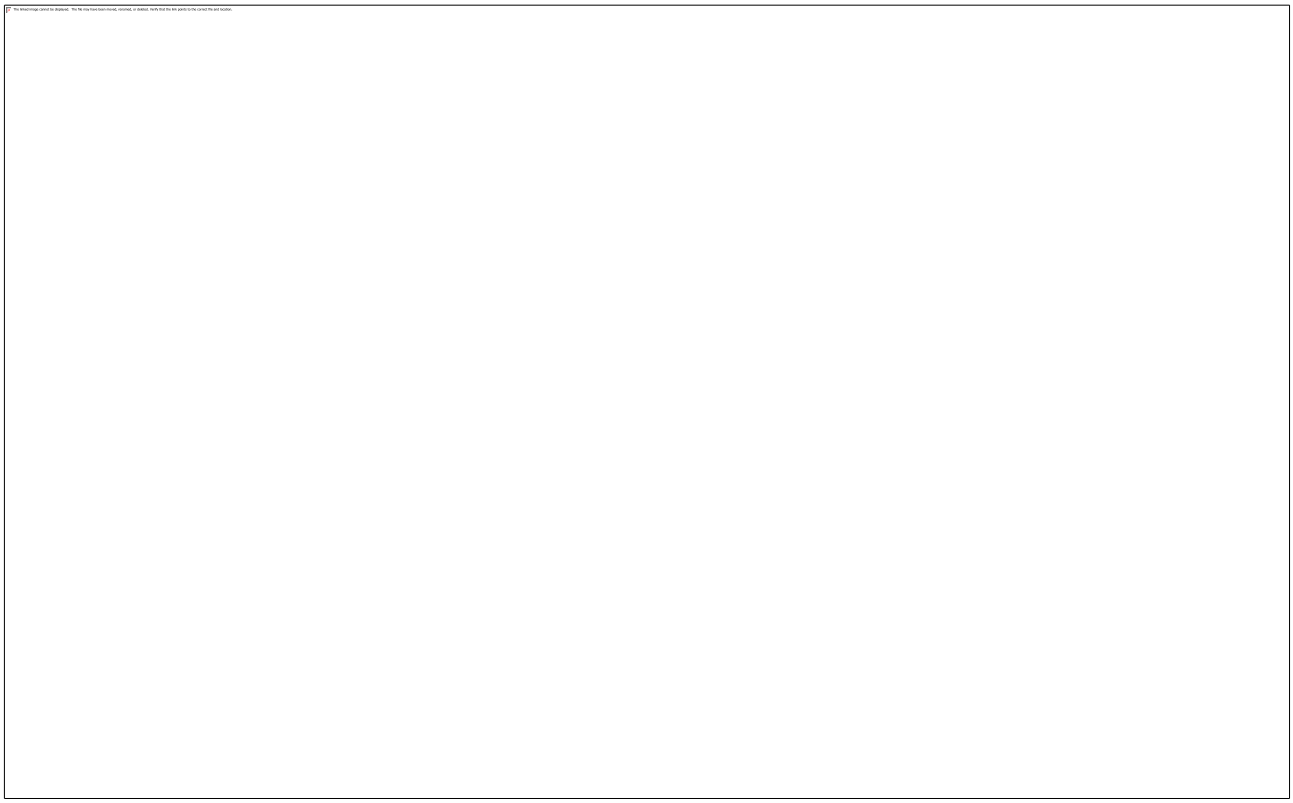


Figure 13.19 Predicted extent of the entrained hydrocarbons exposure over the entire 30 days for the simulation that led to the largest volume of oil ashore from a vessel collision.

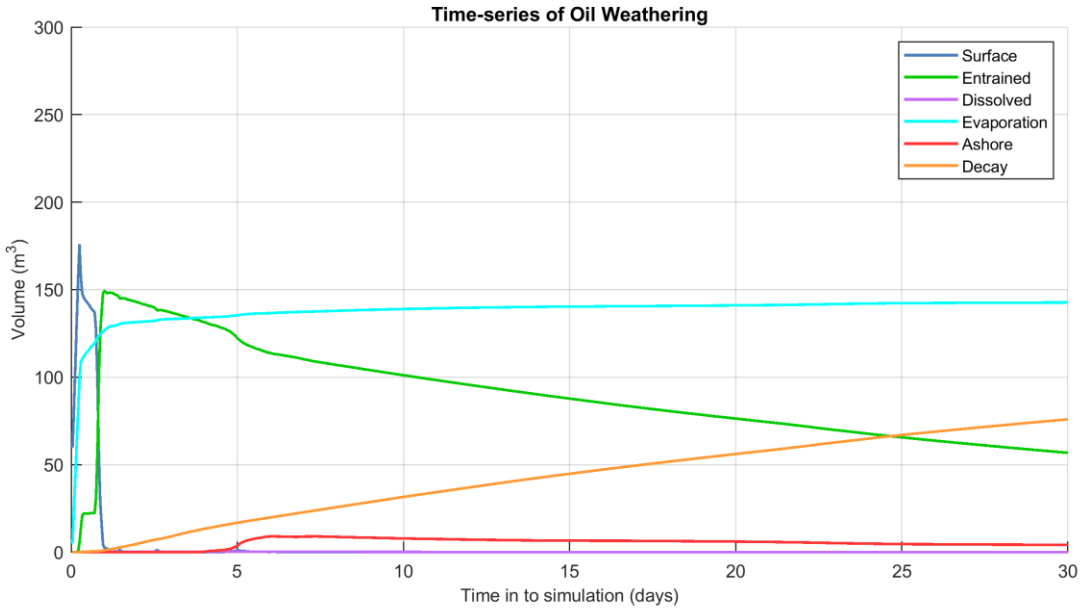


Figure 13.20 Predicted weathering and fates for the simulation that led to the largest volume of oil ashore from a vessel collision.

14 MODELLING RESULTS: SUBSEA LOWC

The scenario investigated the potential exposure from a 347,584 bbl (or 55,256 m^3) subsea release of condensate over 77 days (4,51 bbl/day or 717 m^3/day) following a LOWC. The condensate was tracked for an additional 30 days following the release to allow concentrations to decrease below the thresholds. The modelling assumed no mitigation efforts are undertaken to collect or otherwise affect the natural transport and weathering.

Section 14.1.1 presents the predicted areas of exposure, Section 14.2 shows the seasonal (or stochastic) results, while Section 14.3 presents the results for the deterministic simulation.

For the stochastic results, the potential exposure and risk were separately calculated for each receptor and have been tabulated, except for the two receptors that the release location resides within (Twofold Shelf IMCRA and Upwelling East of Eden KEF).

14.1 Stochastic Analysis

14.1.1 Areas of Exposure

Figure 14.1 presents the areas of exposure based on the ‘low’, ‘moderate’ and ‘high’ thresholds are derived from all 200 spill simulations.

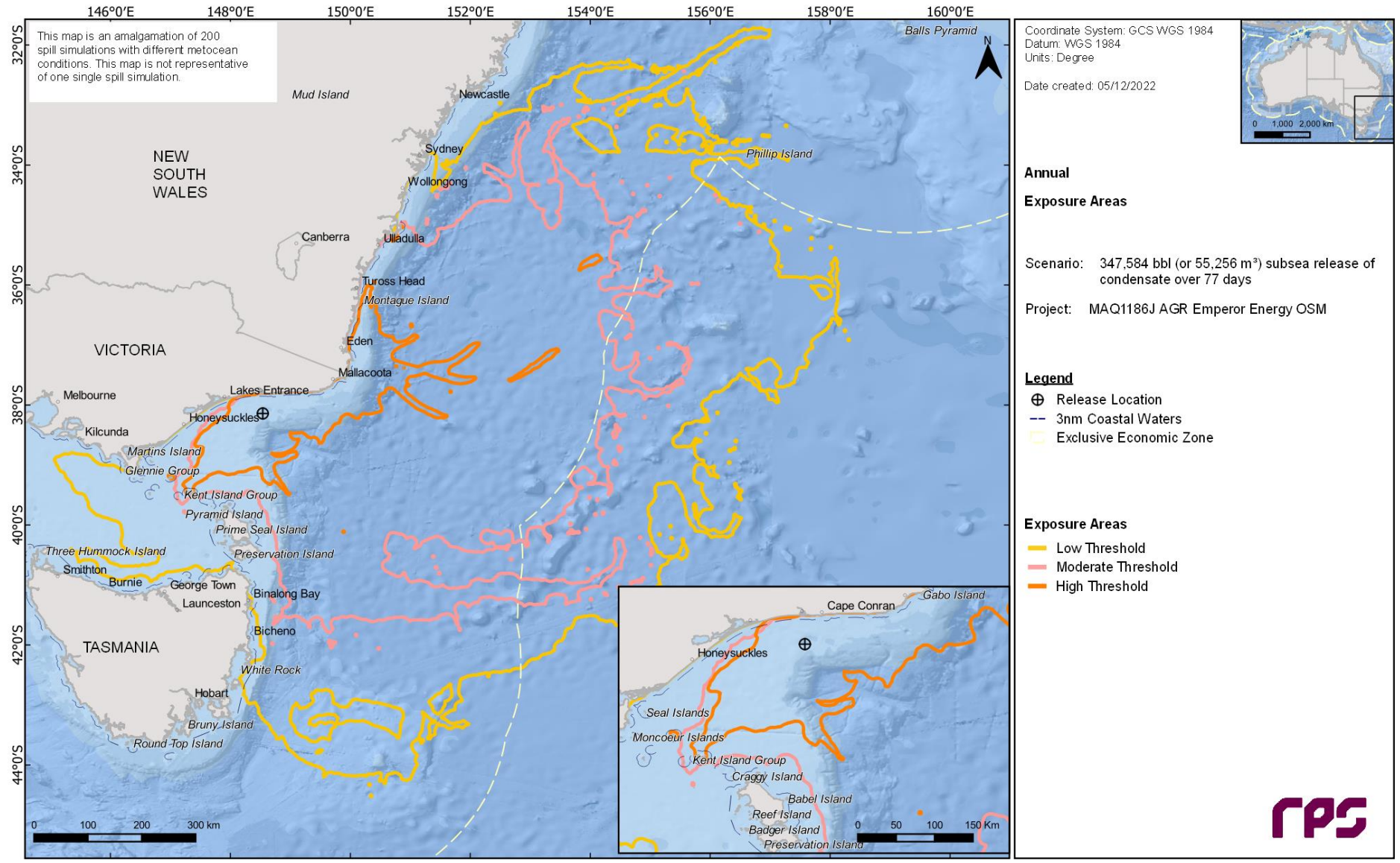


Figure 14.1 Predicted areas of exposure following a subsea LOWC, derived from all 200 spill simulations.

14.2 Stochastic Analysis

14.2.1 Floating Oil Exposure

Table 14.1 summarises the maximum distances from the release location to floating oil exposure thresholds. Floating oil concentrations exceeding 1 g/m^2 could extend up to 202.2 km from the release location. The distance reduces to 18.3 km as the threshold increases to 10 g/m^2 and 0.4 km as the threshold further increases to the 50 g/m^2.

Table 14.2 presents the predicted floating oil exposure to receptors for each season. The highest probabilities of exposure at concentrations ≥1 g/m^2 was forecast for Victorian State waters for summer (9%) and winter (23%). There was no exposure predicted to any of the receptors as the threshold increases to 10 g/m^2.

The quickest time for exposure at the 1 g/m^2 threshold was predicted at Victorian State waters during summer conditions 3.42 days after the commencement of the spill.

Figure 14.2 to Figure 14.3 illustrate the extent of floating oil exposure zones for each season.

Table 14.1 Maximum distances from the release location to floating oil exposure thresholds from a subsea LOWC for each season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Floating oil exposure thresholds		
		1 g/m^2	10 g/m^2	50 g/m^2
Summer	Maximum distance (km) from release location	176.1	18.3	-
	Maximum distance (km) from release location (99th percentile)	90.7	17.2	-
	Direction	ENE	WSW	-
Winter	Maximum distance (km) from release location	202.2	15.1	0.4
	Maximum distance (km) from release location (99th percentile)	89.5	14.3	0.4
	Direction	NE	SW	WNW

Table 14.2 Summary of the floating oil exposure to receptors from a subsea LOWC during each season. Results were calculated from 100 spill simulations per season.

Receptors		Summer						Winter					
		Probability (%) floating oil exposure at			Minimum time (days) before floating oil exposure at			Probability (%) floating oil exposure at			Minimum time (days) before floating oil exposure at		
Type	Name	1 g/m^2	10 g/m^2	50 g/m^2	1 g/m^2	10 g/m^2	50 g/m^2	1 g/m^2	10 g/m^2	50 g/m^2	1 g/m^2	10 g/m^2	50 g/m^2
MNP	Cape Howe	-	-	-	-	-	-	6	-	-	20.96	-	-
	Point Hicks	1	-	-	58.83	-	-	1	-	-	5.83	-	-
Nearshore waters	East Gippsland	9	-	-	3.42	-	-	18	-	-	5.83	-	-
	Gabo Island	-	-	-	-	-	-	3	-	-	20.42	-	-
State Waters	New South Wales	-	-	-	-	-	-	1	-	-	63.58	-	-
	Victoria	9	-	-	3.42	-	-	23	-	-	5.83	-	-

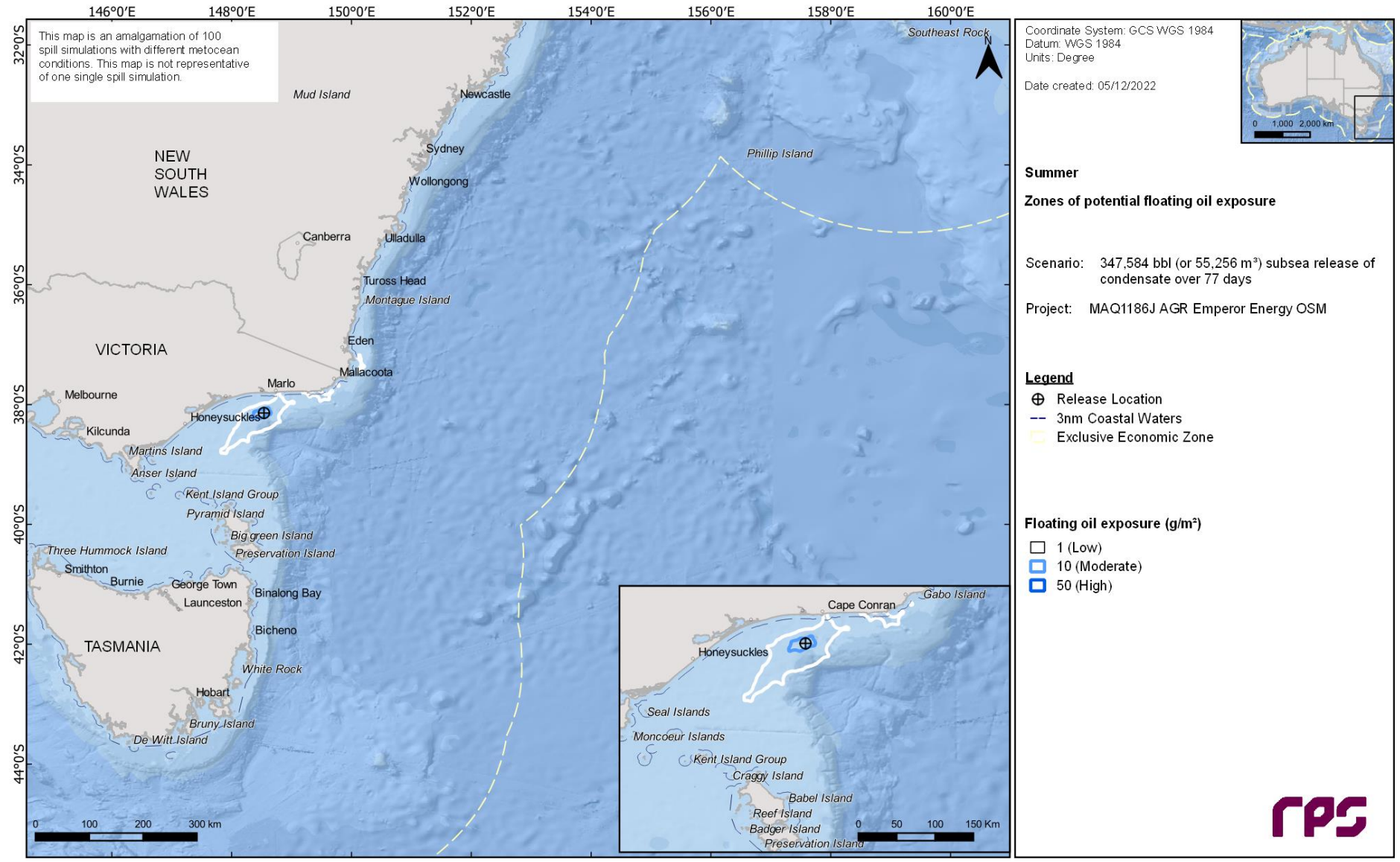


Figure 14.2 Zones of potential floating oil exposure from a subsea LOWC during summer conditions. The results were calculated from 100 spill simulations.

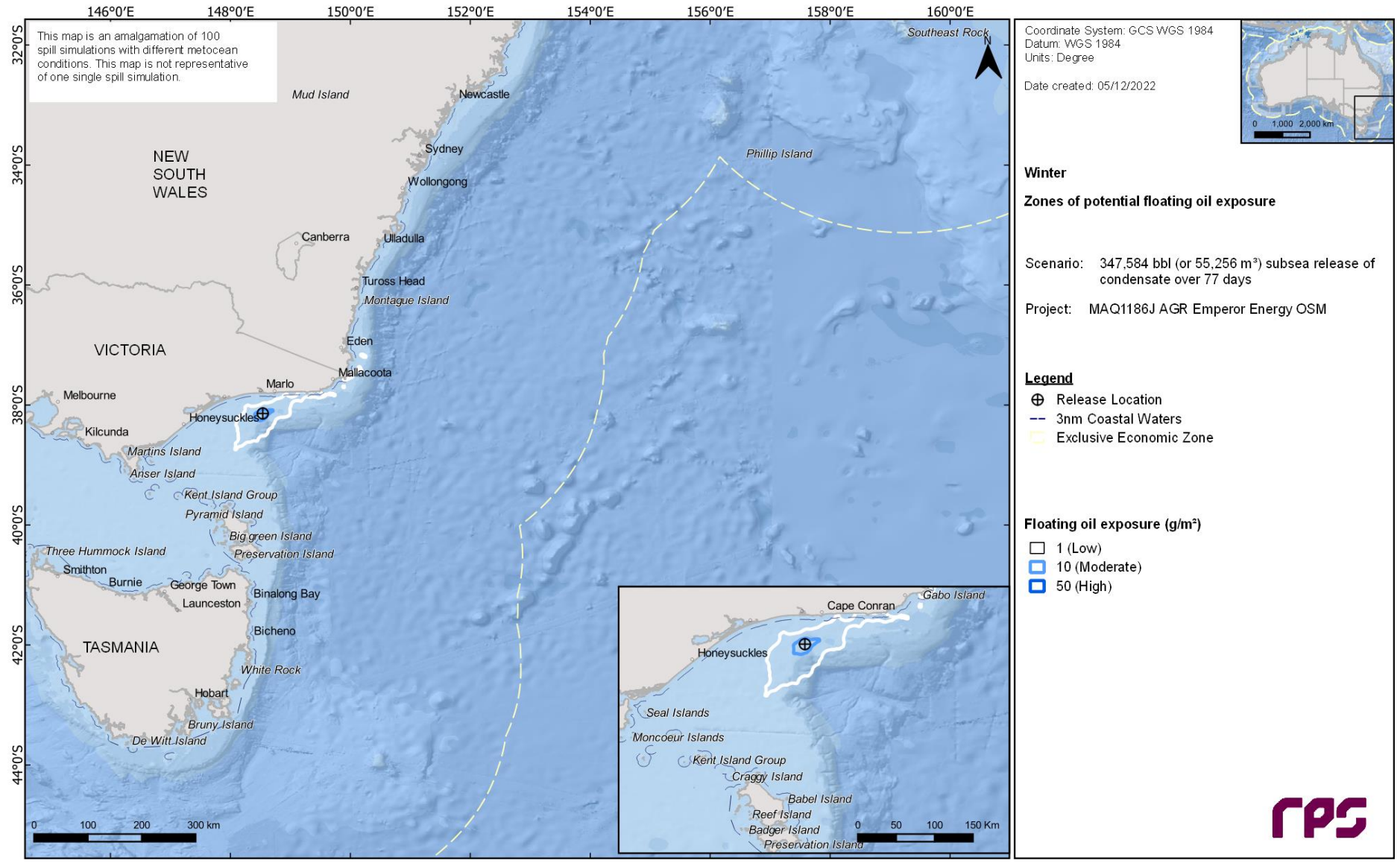


Figure 14.3 Zones of potential floating oil exposure from a subsea LOWC during winter conditions. The results were calculated from 100 spill simulations.

14.2.2 Shoreline Accumulation

Table 14.3 summarises the predicted oil accumulation on any shoreline during each season. The highest probability of accumulation at the 10 g/m^2 threshold was during winter at 98% and the minimum time before the condensate had reached the shorelines at or above the 10 g/m^2 threshold was 2.92 days. The maximum volume ashore was 28.1 m^3.

Table 14.4 and Table 14.5 summarise the accumulation on shoreline sectors during each season. The highest probability of accumulation at the 10 g/m^2 threshold was forecast for the East Gippsland coastline (75% during summer and 90% for winter conditions). The maximum volume of condensate ashore was also forecast for the East Gippsland shoreline at 17 m^3 and 28 m^3 during summer and winter conditions, respectively.

The quickest time before condensate had accumulated at the 10 g/m^2 threshold was 2.9 days during winter conditions at the Bega Valley shoreline.

The maximum potential shoreline loading for each season are presented in Figure 14.4 and Figure 14.5.

Table 14.3 Summary of accumulation on any shoreline from a subsea LOWC during each season. Results were calculated from 100 spill simulations per season.

Shoreline Statistics	Summer	Winter
Probability of accumulation on any shoreline (%) at or above the 10 g/m^2 threshold	89	98
Absolute minimum time before oil ashore (days) at or above the 10 g/m^2 threshold	3.13	2.92
Maximum volume of hydrocarbons ashore (m^3)	17.1	28.1
Average volume of hydrocarbons ashore (m^3)	2.9	5.2
Maximum length of the shoreline at **10 g/m^2** (km)	48	79
Average shoreline length (km) at **10 g/m^2** (km)	9.1	15.9
Maximum length of the shoreline at **100 g/m^2** (km)	4	7
Average shoreline length (km) at **100 g/m^2** (km)	2.3	2.5
Maximum length of the shoreline at **1,000 g/m^2** (km)	-	-
Average shoreline length (km) at **1,000 g/m^2** (km)	-	-

Table 14.4 **Summary of accumulation for shoreline sectors from a subsea LOWC during summer conditions. Results were calculated from 100 spill simulations per season.**

Shoreline sector	Maximum probability of shoreline accumulation (%) at			Minimum time before shoreline accumulation (days) at			Load on shoreline (g/m^2)		Volume on shoreline (m^3)		Mean length of shoreline accumulation (km) at			Maximum length of shoreline accumulation (km) at		
	≥ 10 g/m^2	≥ 100 g/m^2	≥ 1,000 g/m^2	≥ 10 g/m^2	≥ 100 g/m^2	≥ 1,000 g/m^2	Mean	Peak	Mean	Peak	≥ 10 g/m^2	≥ 100 g/m^2	≥ 1,000 g/m^2	≥ 10 g/m^2	≥ 100 g/m^2	≥ 1,000 g/m^2
Babel Island	2	-	-	31.17	-	-	1	41	< 0.1	0.6	0.9	-	-	0.9	-	-
Bega Valley	38	-	-	5.63	-	-	2	64	0.6	3.2	3.7	-	-	9.9	-	-
Curtis Island	1	-	-	13.17	-	-	10	10	0.2	0.2	0.9	-	-	0.9	-	-
East Gippsland	75	12	-	3.13	30	-	3	391	2.2	17	6	2.1	-	40.4	3.6	-
Eurobodalla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flinders Island	2	-	-	30.29	-	-	< 1	26	< 0.1	3.4	13	-	-	14.4	-	-
Gabo Island	32	-	-	6.88	-	-	5	47	0.2	1	1.7	-	-	2.7	-	-
Hogan Island Group	1	-	-	34.75	-	-	12	12	0.4	0.4	1.8	-	-	1.8	-	-
Kent Island Group	22	-	-	9.96	-	-	2	35	0.2	1.4	1.9	-	-	4.5	-	-
Montague Island	3	-	-	22.25	-	-	2	32	< 0.1	1	4.2	-	-	4.5	-	-
Shoal Haven	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 14.5 Summary of oil accumulation for shoreline sectors from a subsea LOWC during winter conditions. Results were calculated from 100 spill simulations per season.

Shoreline sector	Maximum probability of shoreline accumulation (%) at			Minimum time before shoreline accumulation (days) at			Load on shoreline (g/m^2)		Volume on shoreline (m^3)		Mean length of shoreline accumulation (km) at			Maximum length of shoreline accumulation (km) at		
	≥ 10 g/m^2	≥ 100 g/m^2	≥ 1,000 g/m^2	≥ 10 g/m^2	≥ 100 g/m^2	≥ 1,000 g/m^2	Mean	Peak	Mean	Peak	≥ 10 g/m^2	≥ 100 g/m^2	≥ 1,000 g/m^2	≥ 10 g/m^2	≥ 100 g/m^2	≥ 1,000 g/m^2
Babel Island	3	-	-	53.88	-	-	3	37	< 0.1	0.8	1.2	-	-	1.8	-	-
Bega Valley	69	5	-	2.92	3.42	-	4	153	0.9	3.8	3.4	1.3	-	13.5	1.8	-
Curtis Island	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
East Gippsland	89	18	-	3	6.25	-	6	444	3.9	28	10.9	1.9	-	68.3	3.6	-
Eurobodalla	3	-	-	31.83	-	-	< 1	20	< 0.1	1	0.9	-	-	0.9	-	-
Flinders Island	3	-	-	53.96	-	-	2	32	0.1	3.4	11.7	-	-	13.5	-	-
Gabo Island	55	3	-	4	20.42	-	13	335	0.6	6.9	2.1	1.8	-	5.4	1.8	-
Hogan Island Group	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kent Island Group	7	-	-	50.29	-	-	2	25	< 0.1	0.9	1.8	-	-	2.7	-	-
Montague Island	9	1	-	26	52	-	4	103	0.1	1.7	1.8	0.9	-	2.7	0.9	-
Shoal Haven	3	-	-	13.75	-	-	< 1	25	< 0.1	2.5	3.9	-	-	7.2	-	-

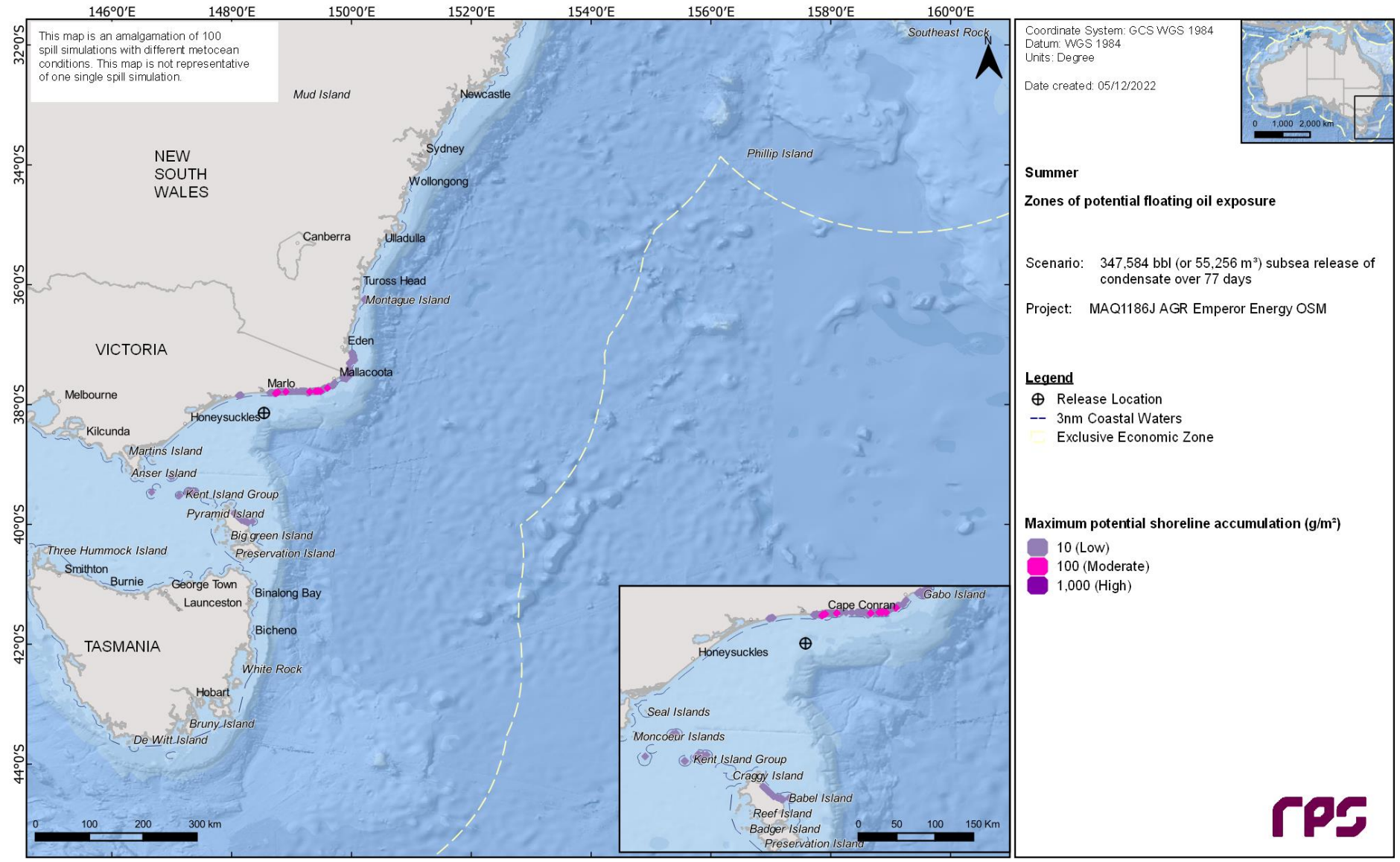


Figure 14.4 Maximum potential shoreline loading from a subsea LOWC during summer conditions. The results were calculated from 100 spill simulations.

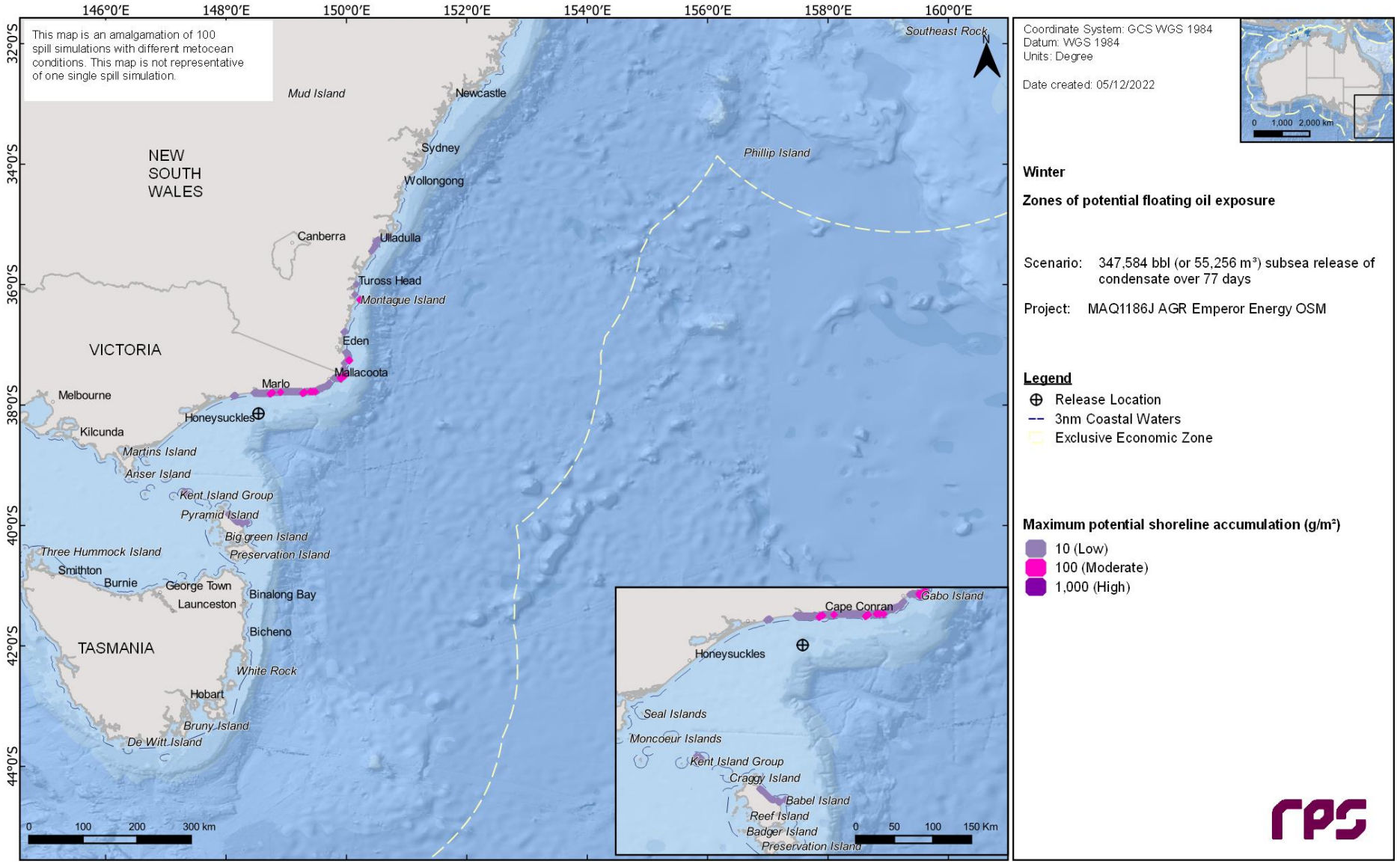


Figure 14.5 Maximum potential shoreline loading from a subsea LOWC during winter conditions. The results were calculated from 100 spill simulations.

14.2.3 In-water exposure

14.2.3.1 Dissolved Hydrocarbons

Table 14.6 summarises the maximum distances from the release location to dissolved hydrocarbons exposure thresholds in the 0 – 10 m depth layer. Concentrations exceeding 10 ppb may potentially occur 1,039.1 km from the release location with the distance reducing to 898.8 km and 186.7 km as the exposure threshold increases to 50 ppb and 400 ppb, respectively.

Table 14.7 summarises the predicted exposure to receptors for each season.

The probability of exposure for concentrations at or above 10 ppb was highest at the New Zealand Star Bank (100% during summer and winter conditions). The highest concentration was predicted at Cape Howe MNP at 394 ppb during winter conditions.

There was no exposure predicted for any receptor at concentrations above 400 ppb.

Figure 14.6 and Figure 14.7 present the dissolved hydrocarbon exposure zones during summer and winter, respectively.

Cross-sectional transects (north-south and east-west) of the maximum dissolved hydrocarbons in the vicinity of the release site are presented in Figure 14.8 to Figure 14.11. The dissolved hydrocarbons above 10 ppb were shown to occur to a depth of 75 m.

Table 14.6 Maximum distances from the release location to dissolved hydrocarbon exposure thresholds from a subsea LOWC during each season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Dissolved hydrocarbon exposure thresholds		
		10 ppb	50 ppb	400 ppb
Summer	Maximum distance (km) from release location	992.3	765.6	186.7
	Maximum distance (km) from release location (99th percentile)	746.7	584.9	186.7
	Direction	NE	ENE	ENE
Winter	Maximum distance (km) from release location	1,039.1	898.8	177.9
	Maximum distance (km) from release location (99th percentile)	718.6	555.5	177.9
	Direction	NE	NE	ENE

Table 14.7 Summary of the dissolved hydrocarbon exposure to receptors from a subsea LOWC during each season. Results were calculated from 100 spill simulations per season.

Receptors		Summer							Winter						
		Highest dissolved concentration (ppb)	Probability (%) of dissolved hydrocarbon exposure at			Minimum time (days) before dissolved hydrocarbon exposure at			Highest dissolved concentration (ppb)	Probability (%) of dissolved hydrocarbon exposure at			Minimum time (days) before dissolved hydrocarbon exposure at		
Type	Name		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb
AMP	Beagle	163	52	4	-	5.83	6.96	-	57	9	1	-	11.67	11.79	-
	Central Eastern	14	1	-	-	86.00	-	-	37	1	-	-	26.42	-	-
	East Gippsland	330	29	5	-	6.63	7.21	-	324	61	10	-	4.50	8.58	-
	Flinders	187	9	2	-	9.17	11.38	-	159	13	2	-	7.71	7.83	-
	Freycinet	166	5	1	-	20.71	34.63	-	166	3	1	-	17.38	28.08	-
	Hunter	19	1	-	-	82.54	-	-	3	-	-	-	-	-	-
	Jervis	36	2	-	-	37.96	40.88	-	77	6	1	-	10.63	18.50	-
CA	Marriott Reef	12	1	-	-	87.88	-	-	1	-	-	-	-	-	-
	Unnamed (Badger Corner)	23	1	-	-	23.92	-	-	-	-	-	-	-	-	-
IMCRA	Batemans Shelf	390	46	13	-	7.33	8.63	33.50	387	84	21	-	2.71	3.50	-
	Boags	38	2	-	-	22.29	-	-	1	-	-	-	-	-	-
	Central Bass Strait	59	9	1	-	13.42	25.63	-	11	1	-	-	83.17	-	-
	Flinders	205	31	3	-	6.33	7.54	-	180	29	5	-	14.04	76.42	-
	Freycinet	77	5	1	-	14.21	47.42	-	23	2	-	-	36.46	-	-
	Hawkesbury Shelf	14	1	0	-	64.54	-	-	42	1	-	-	19.67	-	-
KEF	Big Horseshoe Canyon	292	77	19	-	5.17	7.96	-	323	91	40	-	1.42	1.46	-

Receptors		Summer							Winter						
		Highest dissolved concentration (ppb)	Probability (%) of dissolved hydrocarbon exposure at			Minimum time (days) before dissolved hydrocarbon exposure at			Highest dissolved concentration (ppb)	Probability (%) of dissolved hydrocarbon exposure at			Minimum time (days) before dissolved hydrocarbon exposure at		
Type	Name		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb
	Canyons on the eastern continental slope	338	19	5	-	23.54	26.33	-	149	32	3	-	7.92	8.00	-
	Seamounts South and east of Tasmania	73	4	1	-	25.71	40.29	-	70	2	1	-	18.42	63.79	-
	Shelf rocky reefs	108	16	2	-	24.21	24.79	-	241	46	7	-	8.04	8.33	-
	Tasman Front and eddy field	40	1	-	-	56.13	83.79	-	80	2	1	-	12.96	20.96	-
	Tasmantid seamount chain	14	1	-	-	93.04	-	-	5	-	-	-	102.38	-	-
MNP	Cape Howe	347	93	46	-	3.71	4.38	-	394	100	60	-	1.71	2.46	-
	Point Hicks	220	94	47	-	1.79	2.54	-	204	97	48	-	1.92	3.71	-
	Wilsons Promontory	21	2	-	-	13.50	-	-	-	-	-	-	-	-	-
MP	Batemans	126	14	3	-	15.58	20.88	-	295	49	8	-	5.42	10.63	-
	Jervis Bay	10	1	-	-	94.46	-	-	89	4	1	-	25.33	75.04	-
MS	Beware Reef	90	28	8	-	5.67	27.67	-	78	26	5	-	4.38	21.75	-
NP	Kent Group	152	43	6	-	6.33	8.58	-	52	5	1	-	14.75	76.42	-
NPC	Booderee	2	-	-	-	-	-	-	16	1	-	-	75.42	-	-
RSB	Beware Reef	90	29	8	-	5.67	27.67	-	78	26	5	-	4.38	21.75	-
	Cutter Rock	18	4	-	-	12.42	-	-	-	-	-	-	-	-	-
	Endeavour Reef	42	17	-	-	12.17	42.50	-	9	-	-	-	-	-	-

Receptors		Summer							Winter						
		Highest dissolved concentration (ppb)	Probability (%) of dissolved hydrocarbon exposure at			Minimum time (days) before dissolved hydrocarbon exposure at			Highest dissolved concentration (ppb)	Probability (%) of dissolved hydrocarbon exposure at			Minimum time (days) before dissolved hydrocarbon exposure at		
Type	Name		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb
	New Zealand Star Bank	284	100	70	-	1.92	1.96	-	330	100	76	-	1.21	1.29	-
	Wakitipu Rock	35	11	-	-	9.96	-	-	23	2	-	-	63.04	-	-
	Warrego Rock	26	6	-	-	19.63	-	-	5	-	-	-	-	-	-
	Wright Rock	71	21	1	-	11.75	40.63	-	15	1	-	-	63.79	-	-
Nearshore Waters	Babel Island	19	2	-	-	43.67	-	-	2	-	-	-	-	-	-
	Bega Valley	243	80	27	-	4.71	6.54	-	226	93	34	-	2.00	5.42	-
	Break O'Day	77	2	1	-	49.92	51.29	-	-	-	-	-	-	-	-
	Cape Barren Osland	115	2	1	-	22.42	70.33	-	13	1	-	-	71.25	-	-
	Circular Head	12	2	-	-	57.67	-	-	-	-	-	-	-	-	-
	Clarke Island	177	1	1	-	70.33	70.33	-	-	-	-	-	-	-	-
	Craggy Island	44	14	-	-	12.50	-	-	21	1	-	-	82.67	-	-
	Curtis Island	38	7	-	-	7.54	58.46	-	7	-	-	-	-	-	-
	Dorset	17	2	-	-	51.96	-	-	-	-	-	-	-	-	-
	East Gippsland	287	81	28	-	2.42	4.58	-	260	96	37	-	2.08	3.50	-
	Eurobodalla	70	5	1	-	15.71	53.42	-	112	28	4	-	8.46	11.21	-
	Flinders Island	39	4	-	-	22.38	82.79	-	3	-	-	-	-	-	-
	Gabo Island	175	85	31	-	4.54	5.08	-	195	92	27	-	2.04	8.04	-
	Hogan Island Group	153	20	3	-	7.13	7.54	-	7	-	-	-	14.04	-	-
	Inner Sister Island	37	5	-	-	22.42	-	-	4	-	-	-	-	-	-

Receptors		Summer							Winter						
		Highest dissolved concentration (ppb)	Probability (%) of dissolved hydrocarbon exposure at			Minimum time (days) before dissolved hydrocarbon exposure at			Highest dissolved concentration (ppb)	Probability (%) of dissolved hydrocarbon exposure at			Minimum time (days) before dissolved hydrocarbon exposure at		
Type	Name		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb
	Kent Island Group	175	40	6	-	6.33	8.33	-	52	4	1	-	16.96	76.42	-
	Kiama	2	-	-	-	-	-	-	11	1	-	-	29.58	-	-
	Moncoeur Islands	36	2	-	-	13.50	-	-	1	-	-	-	-	-	-
	Montague Island	98	8	2	-	16.92	21.29	-	138	41	7	-	5.42	15.92	-
	Outer Sister Island	33	7	-	-	17.17	-	-	8	-	-	-	-	-	-
	Pasco Group	13	1	-	-	23.29	-	-	3	-	-	-	-	-	-
	Prime Seal Island	20	1	-	-	33.25	-	-	2	-	-	-	-	-	-
	Pyramid Island	33	15	-	-	14.00	-	-	36	2	-	-	62.33	-	-
	Rodondo Island	37	1	-	-	49.04	-	-	-	-	-	-	-	-	-
	Seal Islands	34	2	-	-	27.54	-	-	1	-	-	-	-	-	-
	Shell Harbour	3	-	-	-	-	-	-	14	1	-	-	29.71	-	-
	Shoal Haven	31	1	-	-	85.75	-	-	174	4	2	-	19.71	29.92	-
	South Gippsland	14	2	-	-	26.13	-	-	-	-	-	-	-	-	-
	Vansittart Island	18	1	-	-	23.79	-	-	1	-	-	-	-	-	-
State Waters	New South Wales	374	90	46	-	3.54	4.54	-	333	100	51	-	1.88	2.42	-
	Tasmania	177	43	6	-	6.33	7.50	-	56	5	1	-	12.79	61.04	-
	Victoria	381	97	60	-	1.71	2.17	-	394	100	65	-	1.58	2.46	-

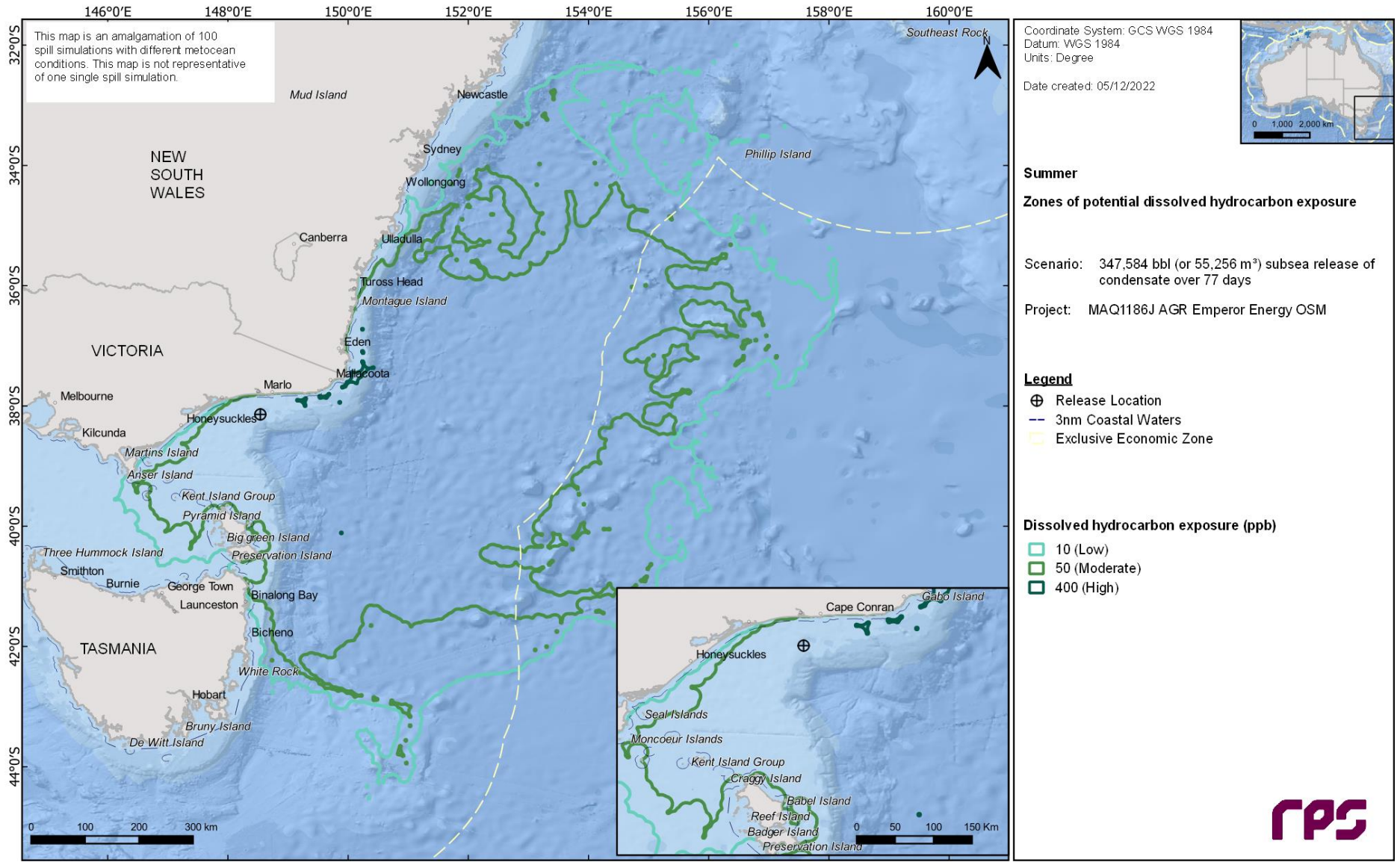


Figure 14.6 Predicted zones of dissolved hydrocarbon exposure from a subsea LOWC during summer conditions. The results were calculated from 100 spill simulations.

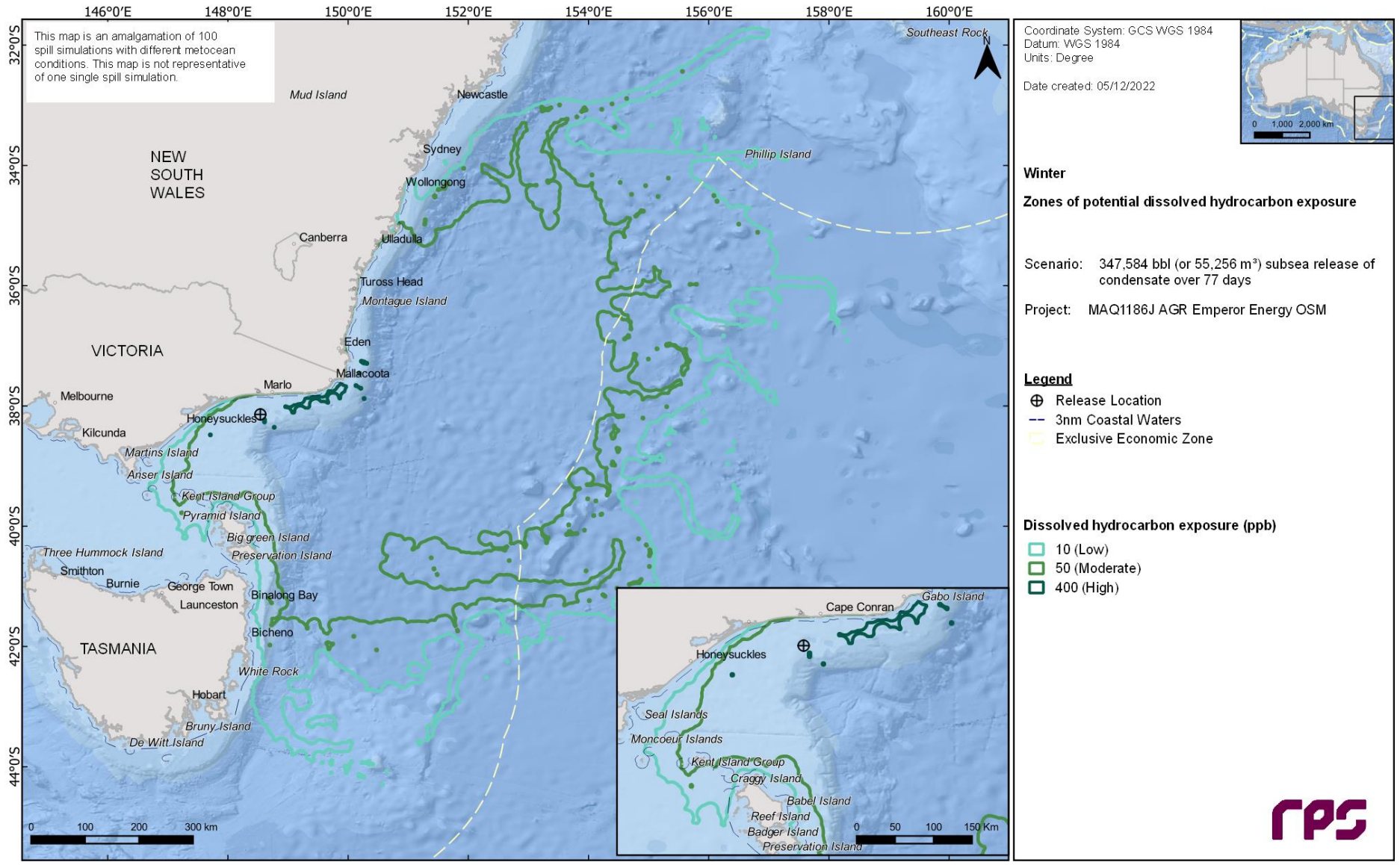


Figure 14.7 Predicted zones of dissolved hydrocarbon exposure from a subsea LOWC during winter conditions. The results were calculated from 100 spill simulations.

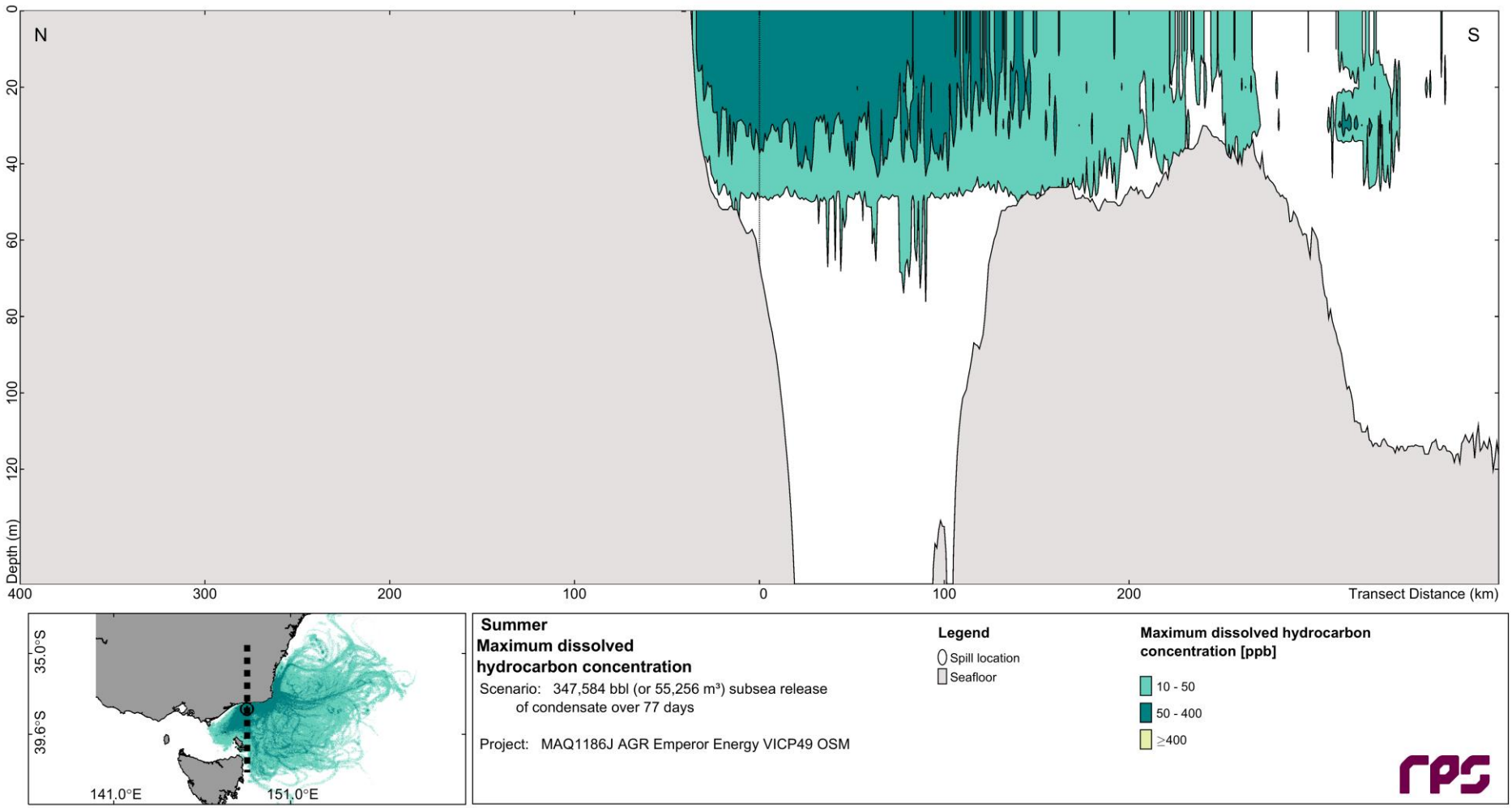


Figure 14.8 North-south cross-section transect of dissolved hydrocarbon concentrations from a subsea LOWC during summer conditions. The results were calculated from 100 spill simulations.

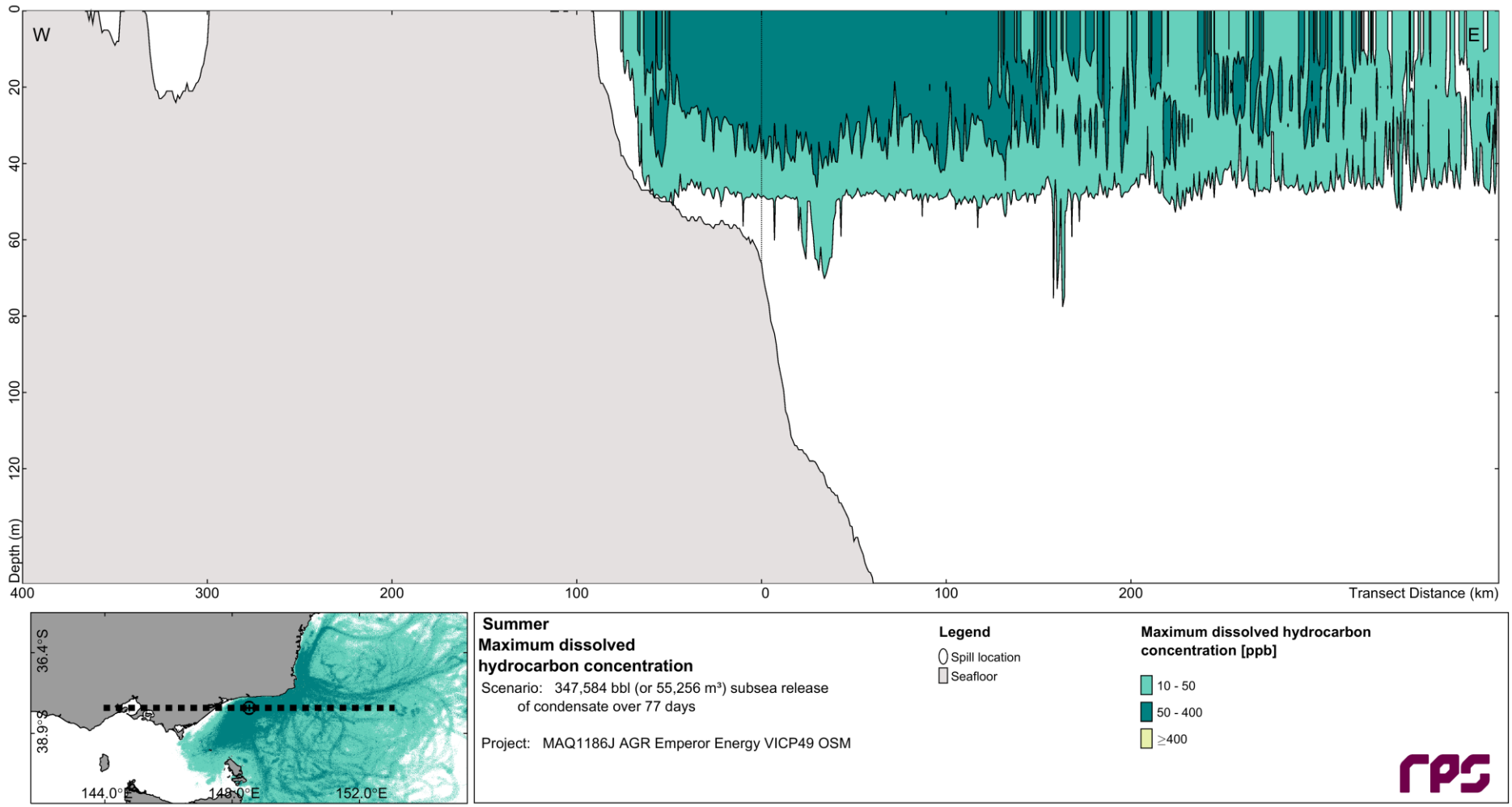


Figure 14.9 East-west cross-section transect of dissolved hydrocarbon concentrations from a subsea LOWC during summer conditions. The results were calculated from 100 spill simulations.

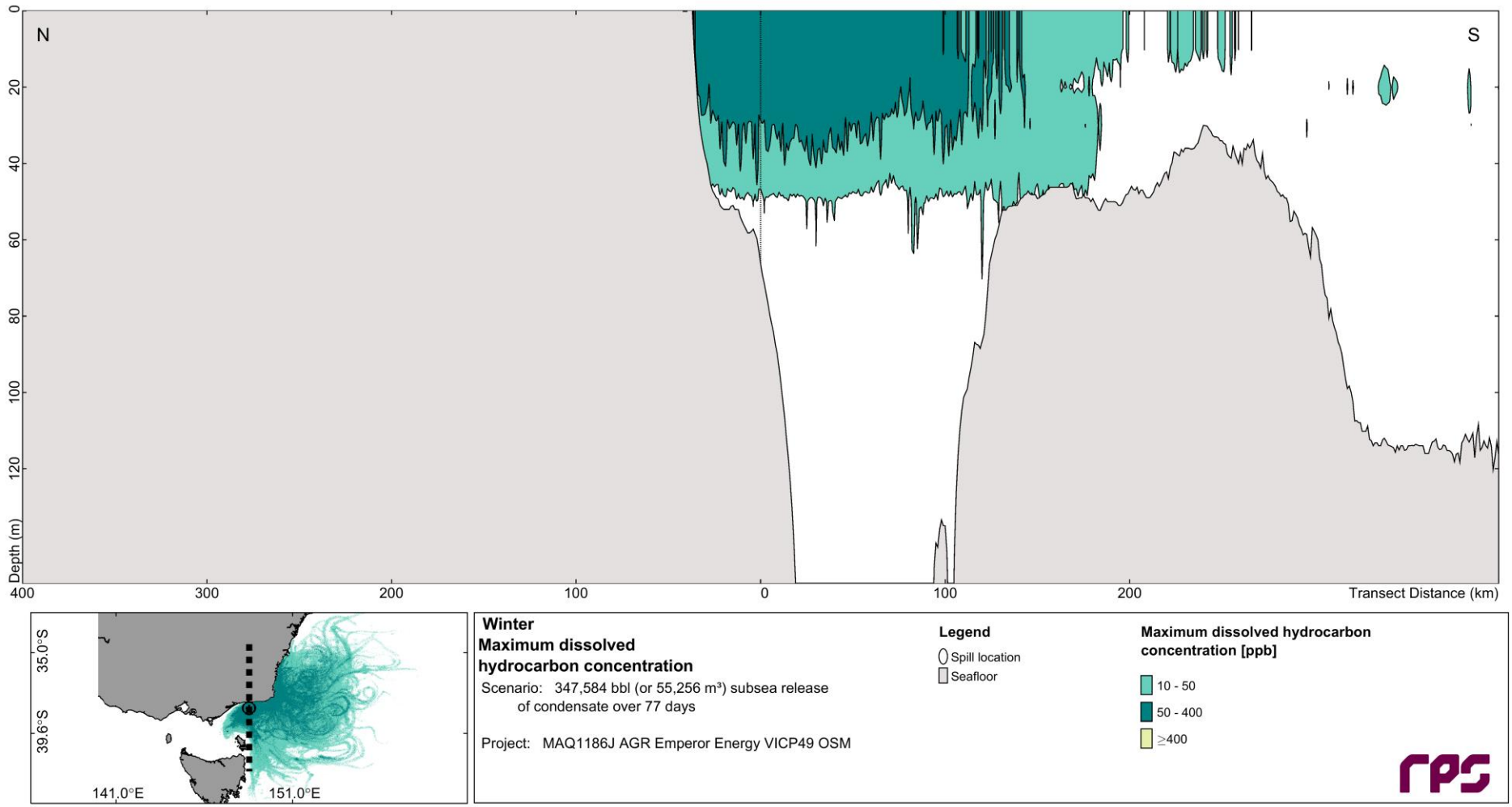


Figure 14.10 North-south cross-section transect of dissolved hydrocarbon concentrations from a subsea LOWC during winter conditions. The results were calculated from 100 spill simulations.

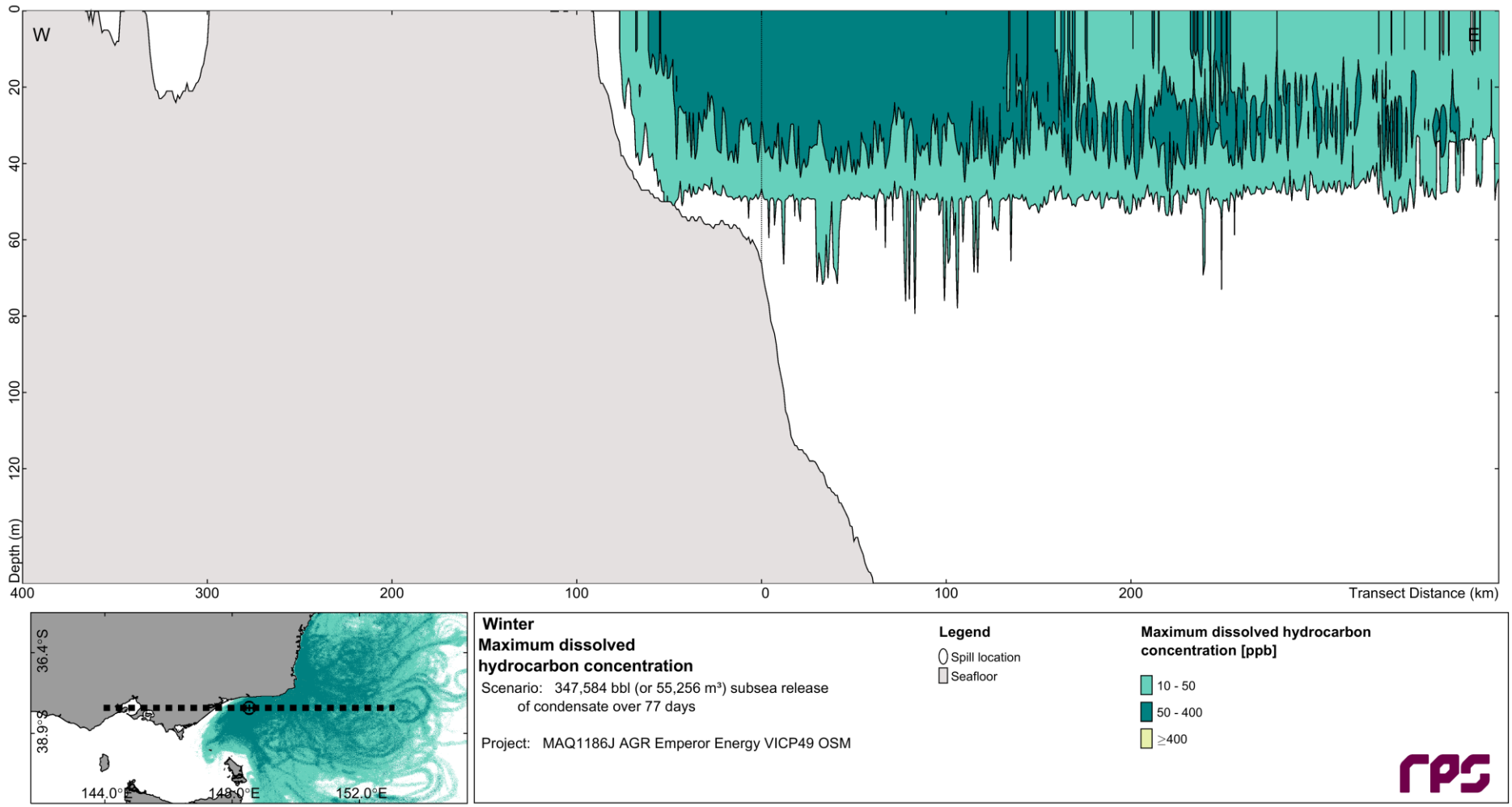


Figure 14.11 East-west cross-section transect of dissolved hydrocarbon concentrations from a subsea LOWC during winter conditions. The results were calculated from 100 spill simulations.

14.2.3.2 Entrained Hydrocarbons

Table 14.8 summarises the maximum distances from the release location to entrained hydrocarbon thresholds within the 0-10 m depth layer, for each season. Concentrations exceeding 10 ppb may potentially occur 917.2 km from the release location, with the distance reducing to 578.3 km as the threshold increases to 100 ppb.

Table 14.9 summarises the predicted exposure to receptors for each season. New Zealand Star Bank and Victorian State waters recorded probabilities of 100% for entrained hydrocarbon exposure at or above 10 ppb for both summer and winter conditions. New Zealand Star Bank recorded the highest probability for concentrations exceeding 100 ppb at 78% for summer and 72% under winter conditions. The quickest time for exposure at or above 10 ppb to any receptor was 0.79 days and 1.63 days for the New Zealand Star Bank during summer and winter conditions, respectively.

The highest concentration of entrained hydrocarbons was predicted at the Big Horseshoe Canyon KEF as 518 ppb.

Figure 14.12 and Figure 14.13 present the entrained hydrocarbon exposure zones during summer and winter, respectively.

Cross-sectional transects (north-south and east-west) of the maximum entrained hydrocarbons in the vicinity of the release site for each season, are presented in Figure 14.14 to Figure 14.17. The entrained hydrocarbons above 10 ppb were shown to occur to a depth of 25 m.

Table 14.8 Maximum distances from the release location to entrained hydrocarbon exposure thresholds in the 0-10 m depth layer from a subsea LOWC during each season. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Entrained hydrocarbon exposure thresholds	
		10 ppb	100 ppb
Summer	Maximum distance (km) from release location	917.2	448.7
	Maximum distance (km) from release location (99th percentile)	757.6	314.6
	Direction	NE	ENE
Winter	Maximum distance (km) from release location	870.4	578.3
	Maximum distance (km) from release location (99th percentile)	745.8	446.4
	Direction	ENE	ENE

Table 14.9 **Summary of the entrained hydrocarbon exposure to receptors from a subsea LOWC during each season. Results were calculated from 100 spill simulations per season.**

Receptors		Summer					Winter				
		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at	
Type	Name		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb
AMP	Beagle	127	78	4	5.21	25.79	67	23	-	12.04	-
	Central Eastern	13	2	-	66.21	-	10	1	-	21.42	-
	East Gippsland	163	76	6	6.38	7.13	130	98	8	4.17	11.75
	Flinders	85	26	-	10.54	-	80	39	-	7.42	-
	Freycinet	42	9	-	20.75	-	33	8	-	22.79	-
	Hunter	13	1	-	82.58	-	5	-	-	-	-
	Jervis	18	7	-	44.46	-	62	7	-	9.67	-
AQR	Towra Point	9	-	-	-	-	22	3	-	30.29	-
CA	Arthur Bay	16	5	-	38.88	-	8	-	-	-	-
	Marriott Reef	23	6	-	33.50	-	6	-	-	-	-
IMCRA	Batemans Shelf	200	63	19	6.88	8.58	140	89	11	2.88	22.04
	Boags	14	4	-	33.83	-	11	1	-	69.83	-
	Bruny	11	1	-	43.42	-	2	-	-	-	-
	Central Bass Strait	44	49	-	12.29	-	35	6	-	51.71	-
	Central Victoria	14	5	-	29.08	-	-	-	-	-	-
	Flinders	91	65	-	6.42	20.58	89	55	-	14.25	-
	Freycinet	31	16	-	13.83	-	23	10	-	26.00	-
	Hawkesbury Shelf	18	2	-	78.33	-	32	5	-	26.63	-
	Victorian Embayments	13	7	-	-	-	5	-	-	-	-

Receptors		Summer					Winter				
		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at	
Type	Name		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb
KEF	Big Horseshoe Canyon	518	95	27	5.00	17.92	298	98	64	1.42	1.42
	Canyons on the eastern continental slope	103	37	1	15.21	67.83	102	61	1	7.58	49.25
	Seamounts South and east of Tasmania	17	6	-	26.54	-	19	6	-	47.92	-
	Shelf rocky reefs	141	34	7	15.46	18.17	88	60	-	8.04	-
MNP	Ninety Mile Beach	21	7	-	41.71	-	10	1	-	75.25	-
	Point Hicks	332	95	74	1.63	2.08	366	100	43	1.63	3.58
	Wilsons Promontory	45	8	-	11.88	-	2	-	-	61.33	-
MP	Batemans	137	40	10	15.67	18.46	81	50	-	8.17	-
	Jervis Bay	15	2	-	88.04	-	101	7	1	13.17	62.46
MS	Beware Reef	221	58	11	5.25	27.42	129	53	7	2.25	22.13
NP	Kent Group	134	74	9	6.17	20.58	48	21	-	17.75	-
NPC	Booderee	6	-	-	-	-	21	4	-	24.25	-
NPS4	Nooramunga Marine and Coastal Park	13	7	-	47.54	-	5	-	-	-	-
Ramsar	Corner Inlet	13	7	-	-	-	5	-	-	-	-
RSB	Beware Reef	239	60	11	5.25	27.42	136	53	7	2.25	22.13
	Cutter Rock	30	17	-	11.92	-	10	1	-	76.67	-
	Endeavour Reef	46	59	-	11.33	-	31	14	-	46.83	-

Receptors		Summer					Winter				
		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at	
Type	Name		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb
	New Zealand Star Bank	328	100	78	1.63	1.92	433	100	72	0.79	2.17
	Wakitipu Rock	44	58	-	9.67	-	35	12	-	47.71	-
	Warrego Rock	41	52	-	16.83	-	21	12	-	48.29	-
	Wright Rock	46	60	-	1-	-	31	14	-	46.63	-
Nearshore Waters	Anser Island	12	5	-	26.21	-	-	-	-	-	-
	Babel Island	50	23	-	17.00	-	52	10	-	49.21	-
	Badger Island	16	11	-	40.04	-	15	2	-	69.63	-
	Bega Valley	171	98	28	4.50	6.96	168	98	18	1.88	13.63
	Big green Island	21	10	-	37.13	-	11	2	-	71.38	-
	Boxen Island	14	8	-	44.04	-	15	2	-	69.79	-
	Break O'Day	13	3	-	65.71	-	5	-	-	-	-
	Cape Barren Osland	39	12	-	15.54	-	17	6	-	49.13	-
	Chalky Island	24	7	-	32.33	-	11	1	-	71.38	-
	Clarke Island	22	4	-	16.08	-	10	1	-	8-	-
	Craggy Island	41	50	-	11.96	-	26	13	-	47.58	-
	Curtis Island	78	32	-	7.38	-	12	3	-	61.42	-
	East Gippsland	286	98	33	1.83	4.38	276	99	33	1.83	4.58
	East Kangaroo Island	21	9	-	32.96	-	12	2	-	70.42	-
	Eurobodalla	57	32	-	16.67	-	39	37	-	15.46	-
	Flinders Island	56	30	-	17.04	-	59	9	-	48.88	-
	Gabo Island	238	98	37	2.79	10.42	238	99	21	1.67	12.63

Receptors		Summer					Winter				
		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at	
Type	Name		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb
	Glamorgan - Spring Bay	13	5	-	39.58	-	1	-	-	-	-
	Glennie Group	11	1	-	72.67	-	-	-	-	-	-
	Goose Island	16	10	-	30.71	-	12	2	-	69.29	-
	Hogan Island Group	132	53	6	6.67	20.67	36	7	-	14.25	-
	Inner Sister Island	49	43	-	17.33	-	53	11	-	48.63	-
	Kanowna Island	16	7	-	27.67	-	-	-	-	-	-
	Kent Island Group	134	74	9	6.42	20.58	44	21	-	45.67	-
	Kiama	7	-	-	-	-	21	3	-	29.96	-
	Moncoeur Islands	47	15	-	11.88	-	12	2	-	61.33	-
	Montague Island	121	37	5	16.17	21.58	61	45	-	9.63	-
	Mount Chappell Island	17	11	-	38.00	-	13	2	-	70.96	-
	Northern Beaches	4	0	-	-	-	12	3	-	30.96	-
	Outer Sister Island	45	37	-	17.00	-	46	9	-	47.75	-
	Pasco Group	32	22	-	23.83	-	10	-	-	-	-
	Preservation Island	12	3	-	45.79	-	12	2	-	70.08	-
	Prime Seal Island	33	20	-	23.75	-	11	2	-	70.13	-
	Pyramid Island	51	56	-	9.25	-	39	5	-	48.79	-

Receptors		Summer					Winter				
		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at		Highest entrained concentration (ppb)	Probability (%) entrained hydrocarbon exposure at		Minimum time (days) before entrained hydrocarbon exposure at	
Type	Name		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb
	Randwick	11	1	-	81.29	-	29	3	-	30.13	-
	Reef Island	21	8	-	32.50	-	11	2	-	70.79	-
	Rodondo Island	47	9	-	12.21	-	3	-	-	-	-
	Seal Islands	37	15	-	13.79	-	11	1	-	76.08	-
	Shell Harbour	8	-	-	-	-	23	3	-	30.25	-
	Shoal Haven	15	2	-	80.54	-	98	10	-	12.63	-
	Skull Rock	14	7	-	27.75	-	-	-	-	-	-
	South Gippsland	36	8	-	12.50	-	3	-	-	-	-
	Sutherland Shire	17	1	-	79.29	-	31	5	-	27.04	-
	Vansittart Island	17	7	-	35.46	-	13	3	-	59.79	-
	Waverly	3	-	-	-	-	23	3	-	30.46	-
	Wellington	16	9	-	18.33	-	14	5	-	53.63	-
	Wollongong	13	1	-	83.88	-	16	5	-	3-	-
	Woollahra	3	-	-	-	-	16	3	-	30.67	-
State Waters	New South Wales	318	98	43	3.42	6.46	295	100	39	1.75	5.50
	Tasmania	134	74	9	6.17	20.58	59	21	-	13.25	-
	Victoria	419	100	78	1.58	2.04	431	100	53	1.13	2.04

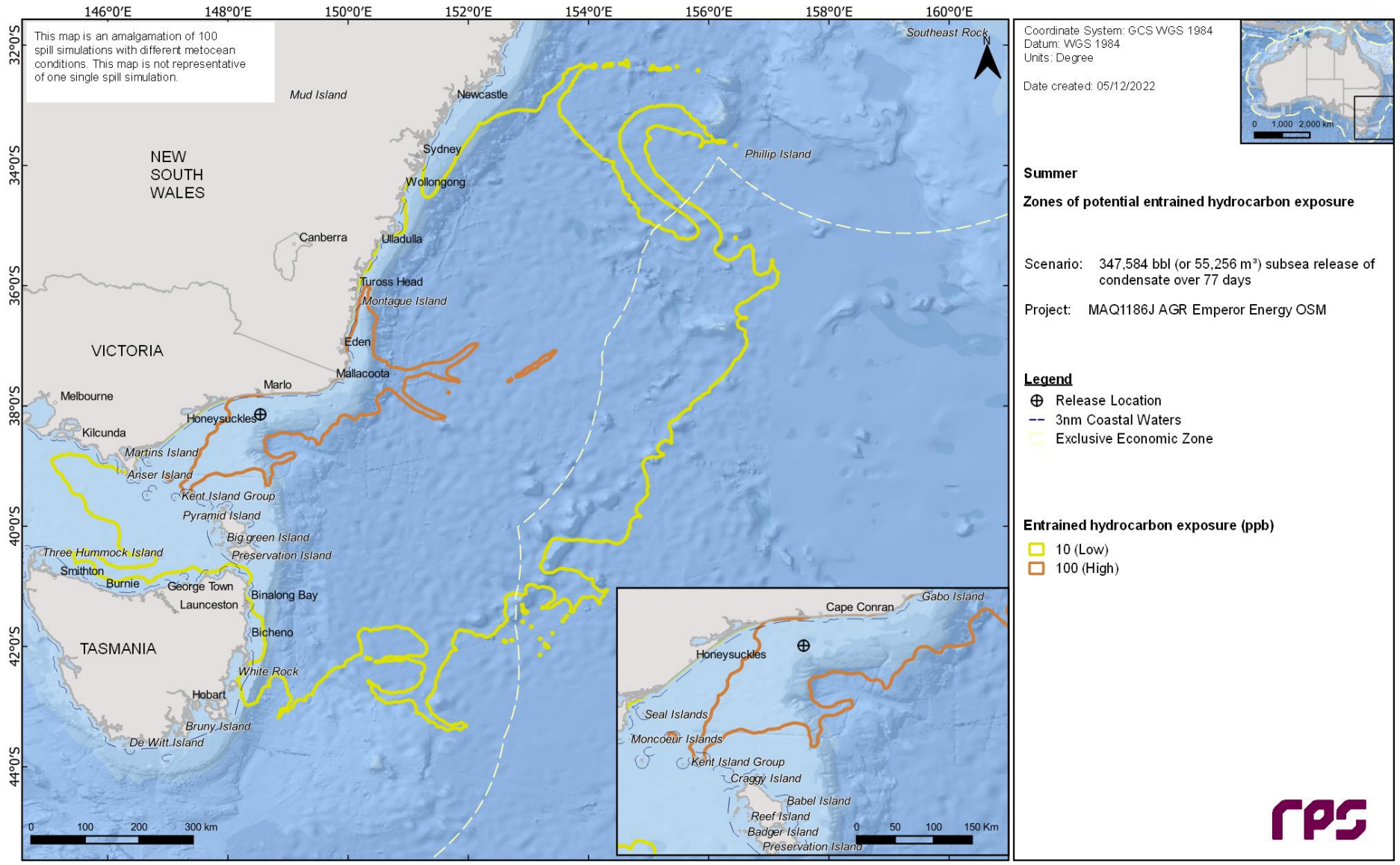


Figure 14.12 Predicted zones of entrained hydrocarbon exposure from a subsea LOWC during summer conditions. The results were calculated from 100 spill simulations.

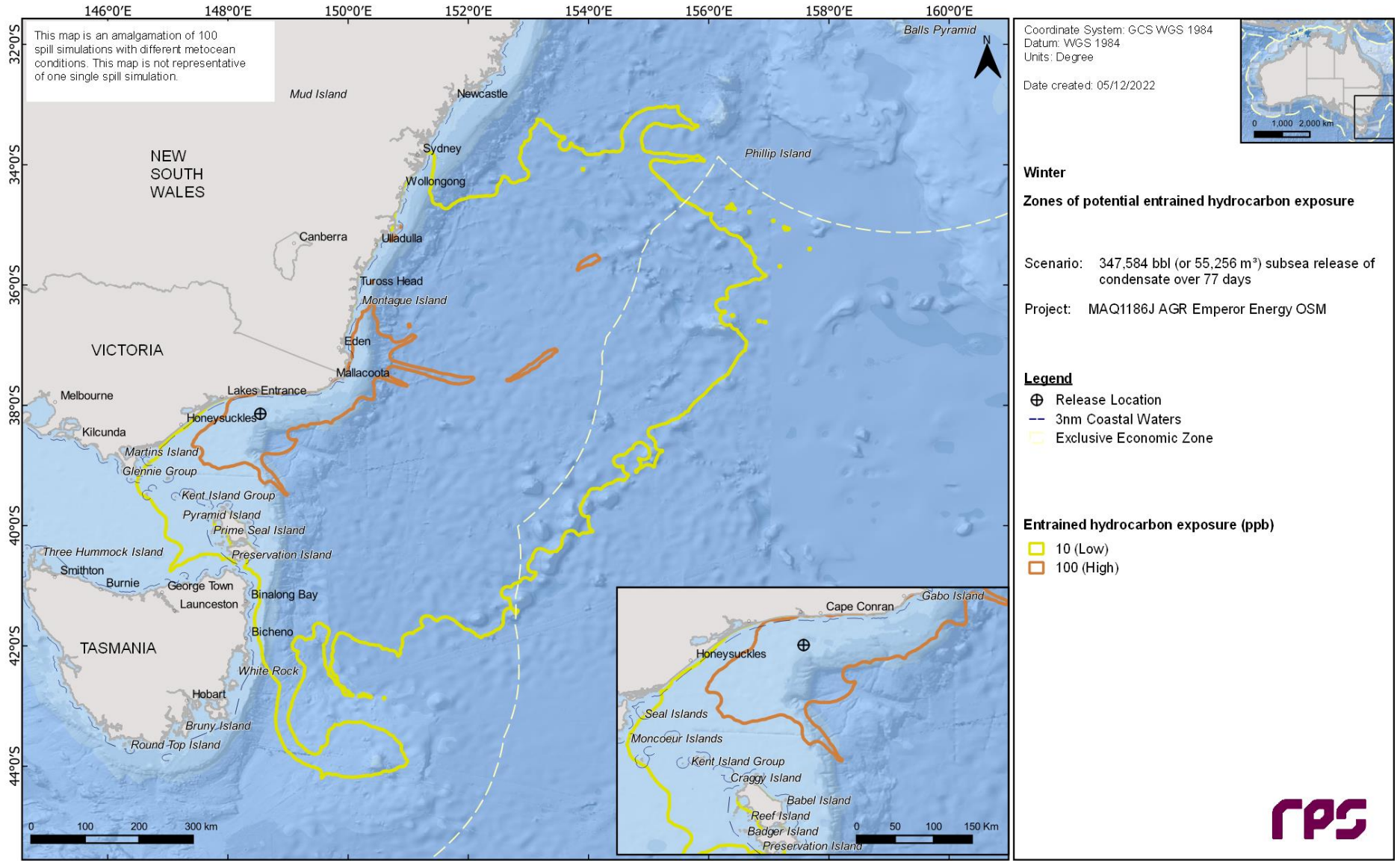


Figure 14.13 Predicted zones of entrained hydrocarbon exposure from a subsea LOWC during winter conditions. The results were calculated from 100 spill simulations.

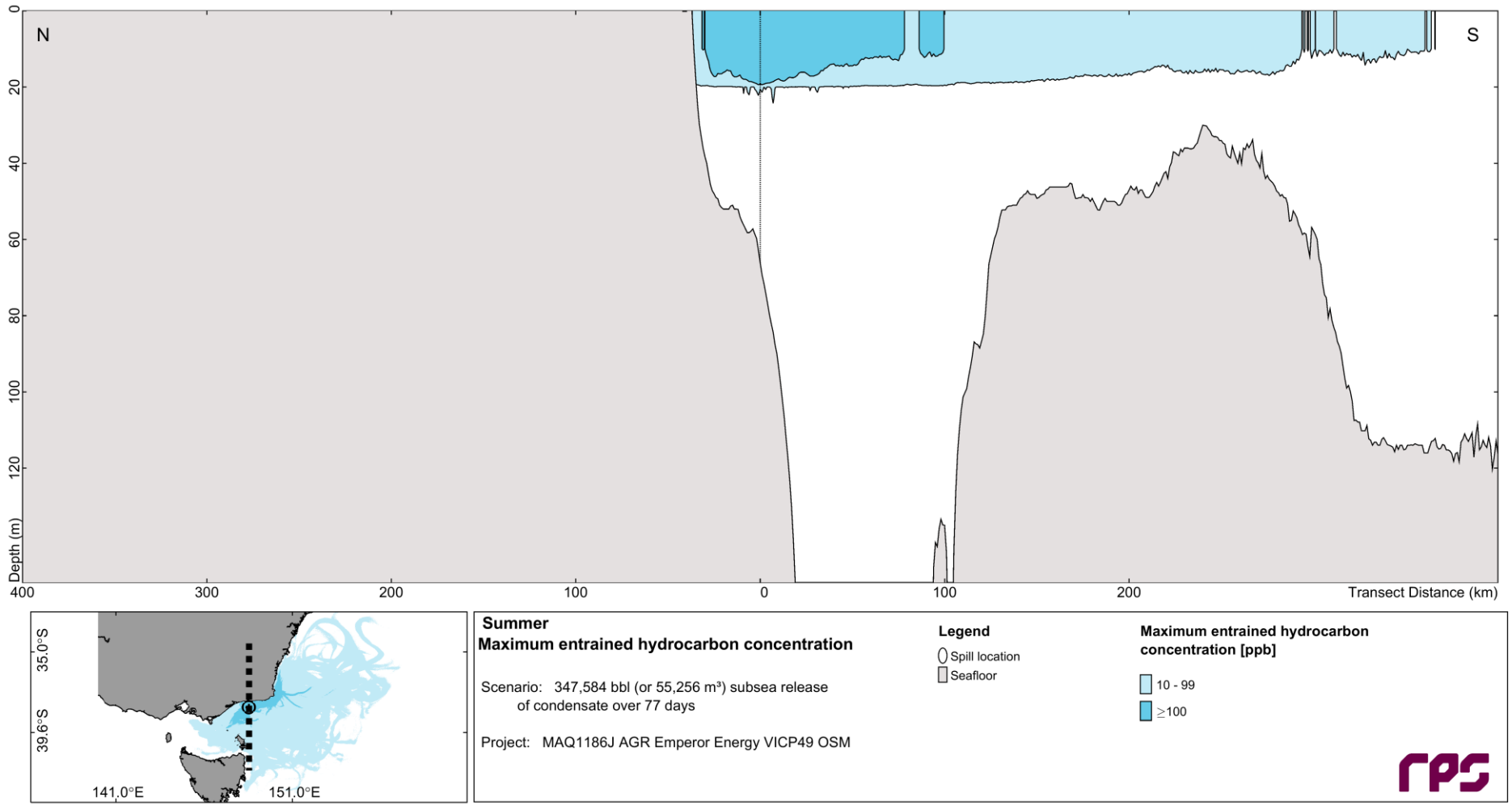


Figure 14.14 North-south cross-section transect of entrained hydrocarbon concentrations from a subsea LOWC during summer conditions. The results were calculated from 100 spill simulations.

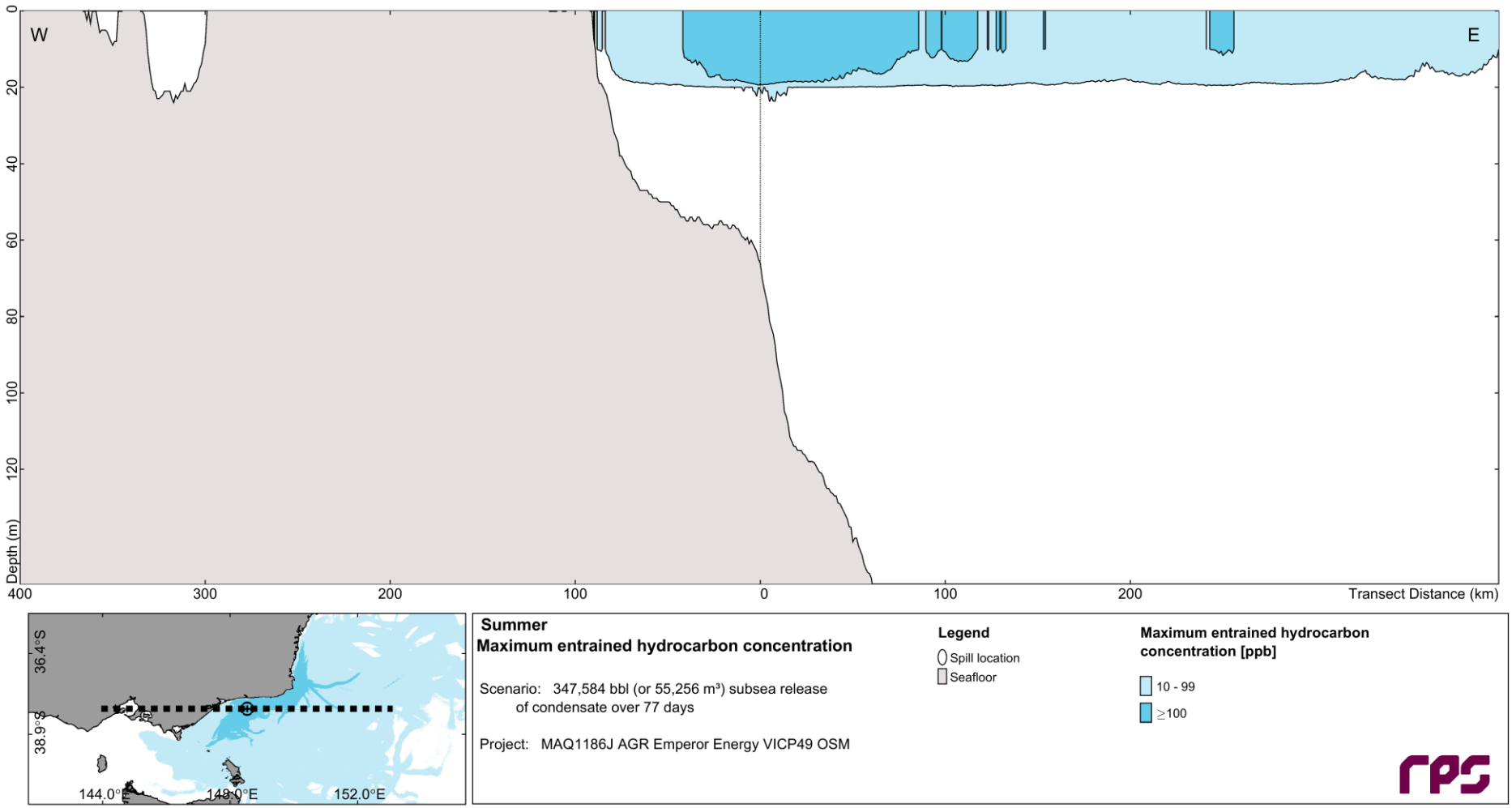


Figure 14.15 East-west cross-section transect of entrained hydrocarbon concentrations from a subsea LOWC during summer conditions. The results were calculated from 100 spill simulations.

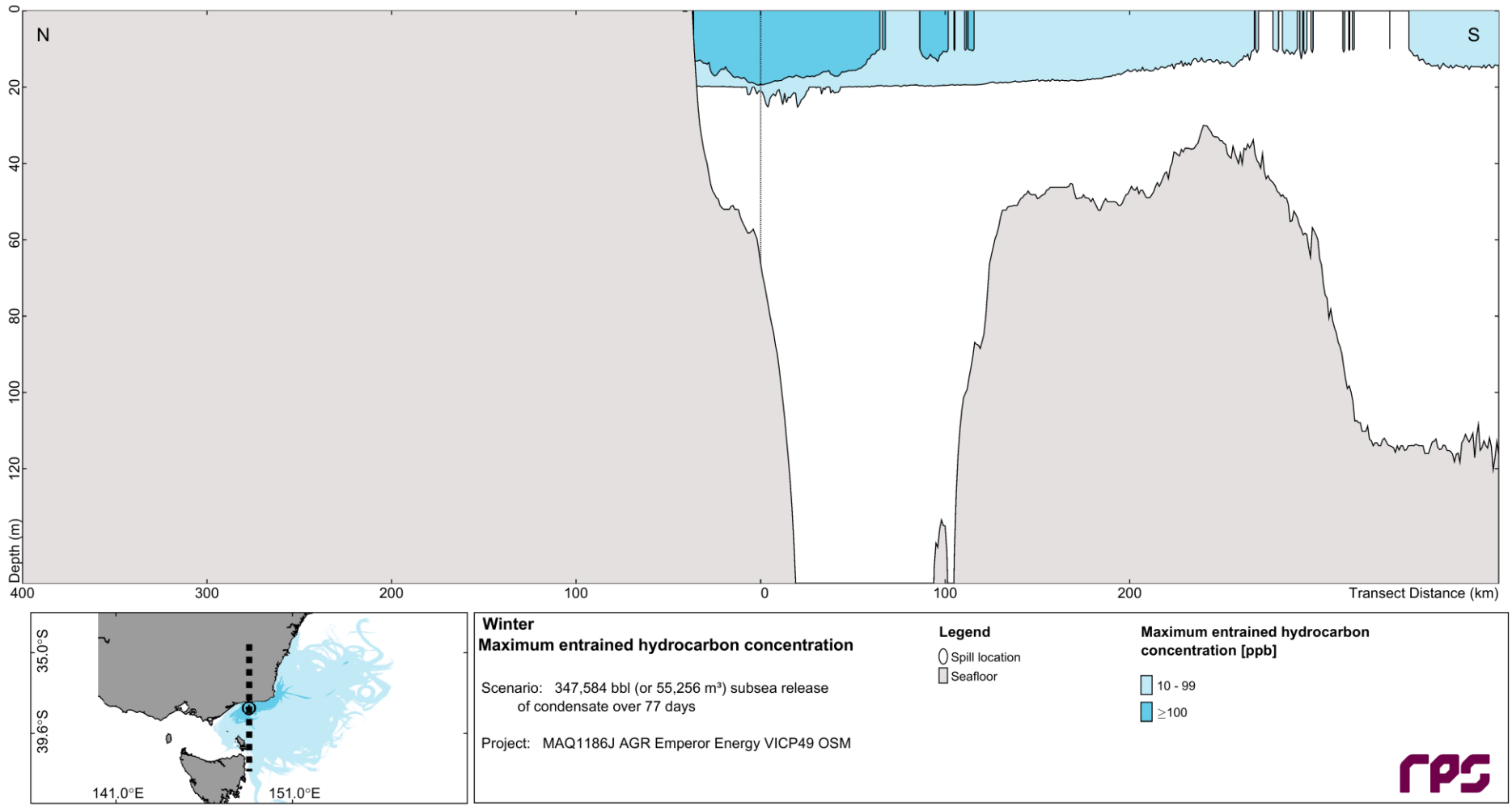


Figure 14.16 North-south cross-section transect of entrained hydrocarbon concentrations from a subsea LOWC during winter conditions. The results were calculated from 100 spill simulations.

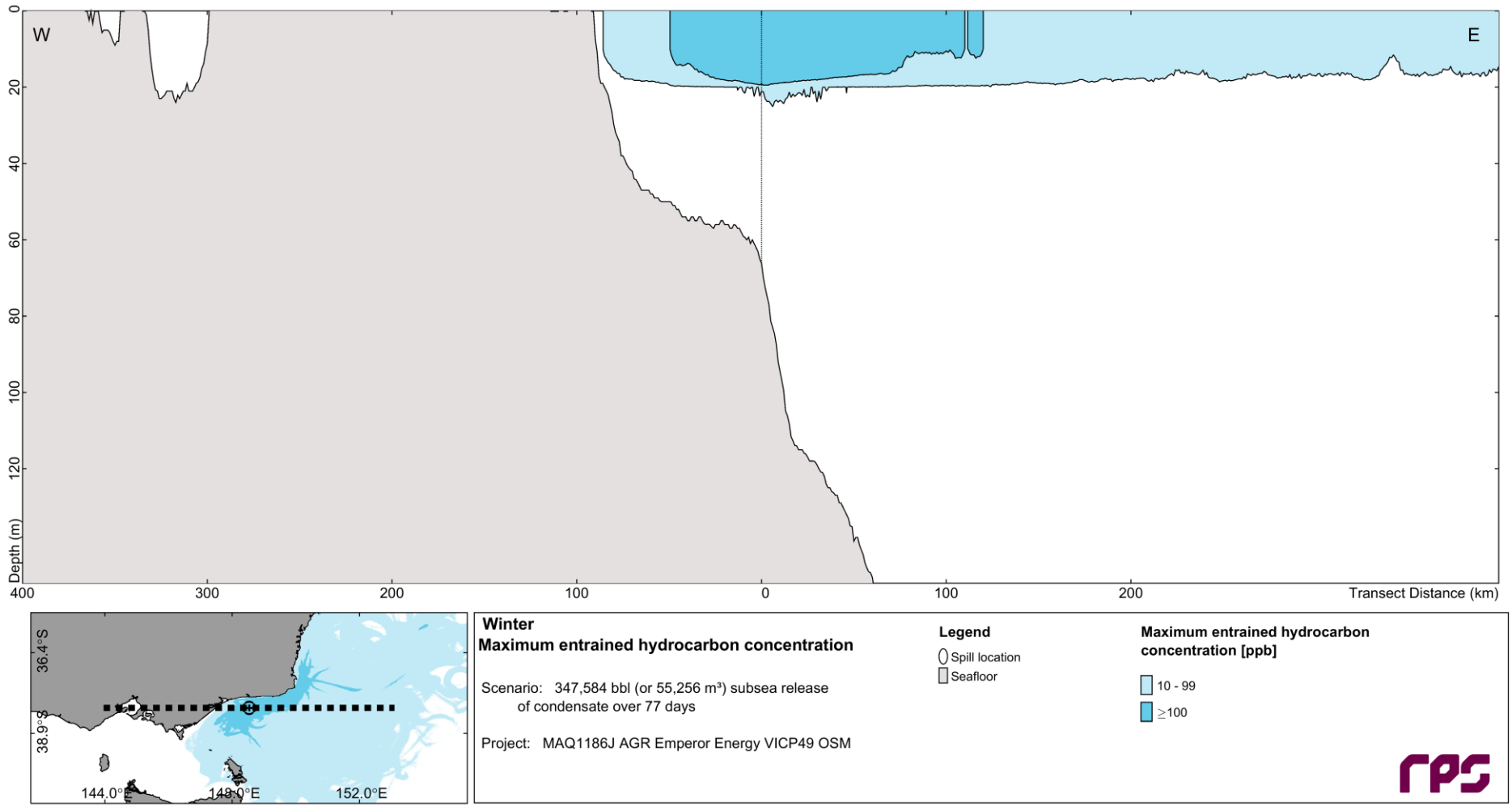


Figure 14.17 East-west cross-section transect of entrained hydrocarbon concentrations from a subsea LOWC during winter conditions. The results were calculated from 100 spill simulations.

14.3 Deterministic Analysis

The simulation that resulted in the largest volume of hydrocarbons ashore of 28.1 m^3 was identified as run number 54 and commenced during winter conditions, 10 pm 3rd June 2013.

Figure 14.18 presents the extent of the predicted floating oil exposure zones on the sea surface (swept area) and the shoreline loading over the entire simulation (107 days). Initial shoreline accumulation occurred on day 11.

The extent of the predicted entrained and dissolved hydrocarbon exposure zones in the 0–10 m depth layer over the entire 120 day simulation are presented in Figure 14.19and Figure 14.20, respectively.

Figure 14.21 presents the fates and weathering for the corresponding simulation. At the conclusion of the simulation (day-107), approximately 47,554 m^3 (~86%) was lost to the atmosphere through evaporation. Approximately, 6,866 m^3 (~12%) of the released volume decayed, while approximately 834 m^3 (~2%) was predicted to remain within the water column and less than 1 m^3 (<1%) was present on the shorelines.

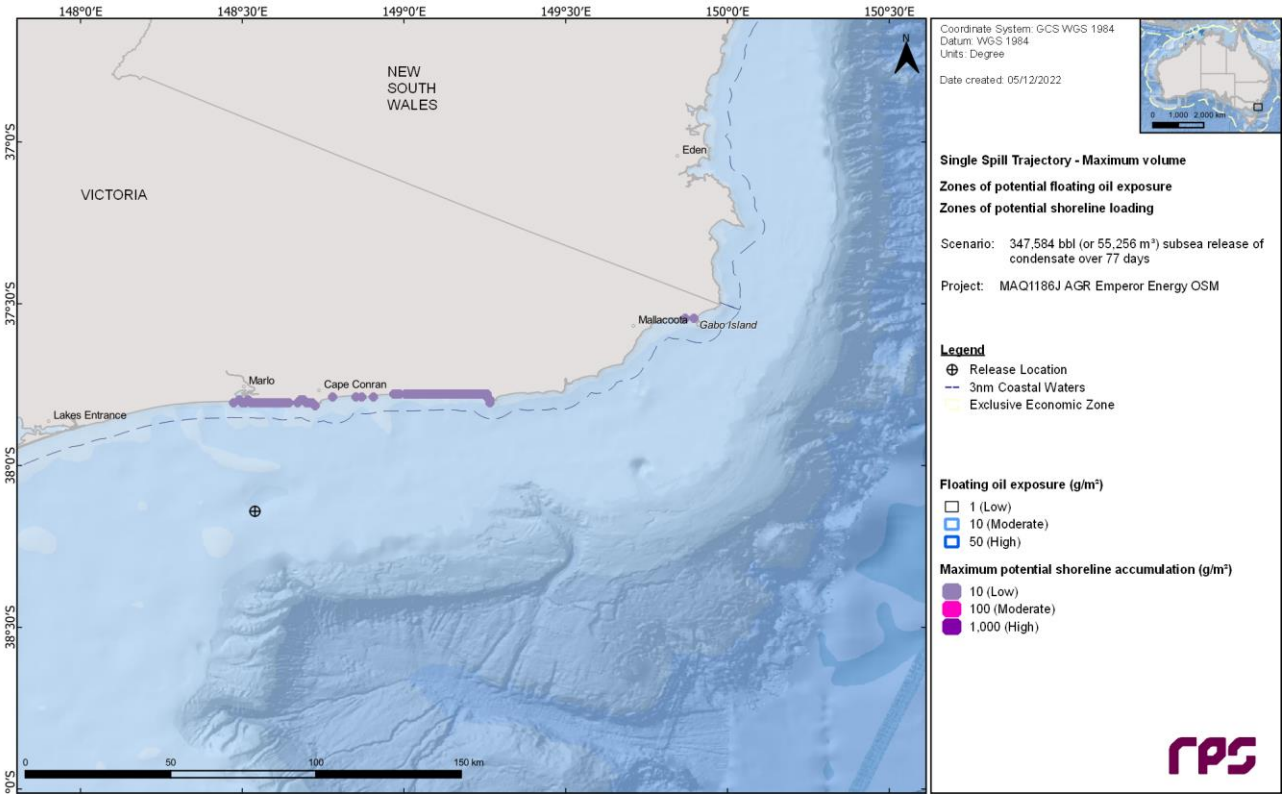


Figure 14.18 Predicted extent of the floating oil exposure and shoreline loading over the entire 107 days of the simulation that led to the largest volume of oil ashore from a subsea LOWC.

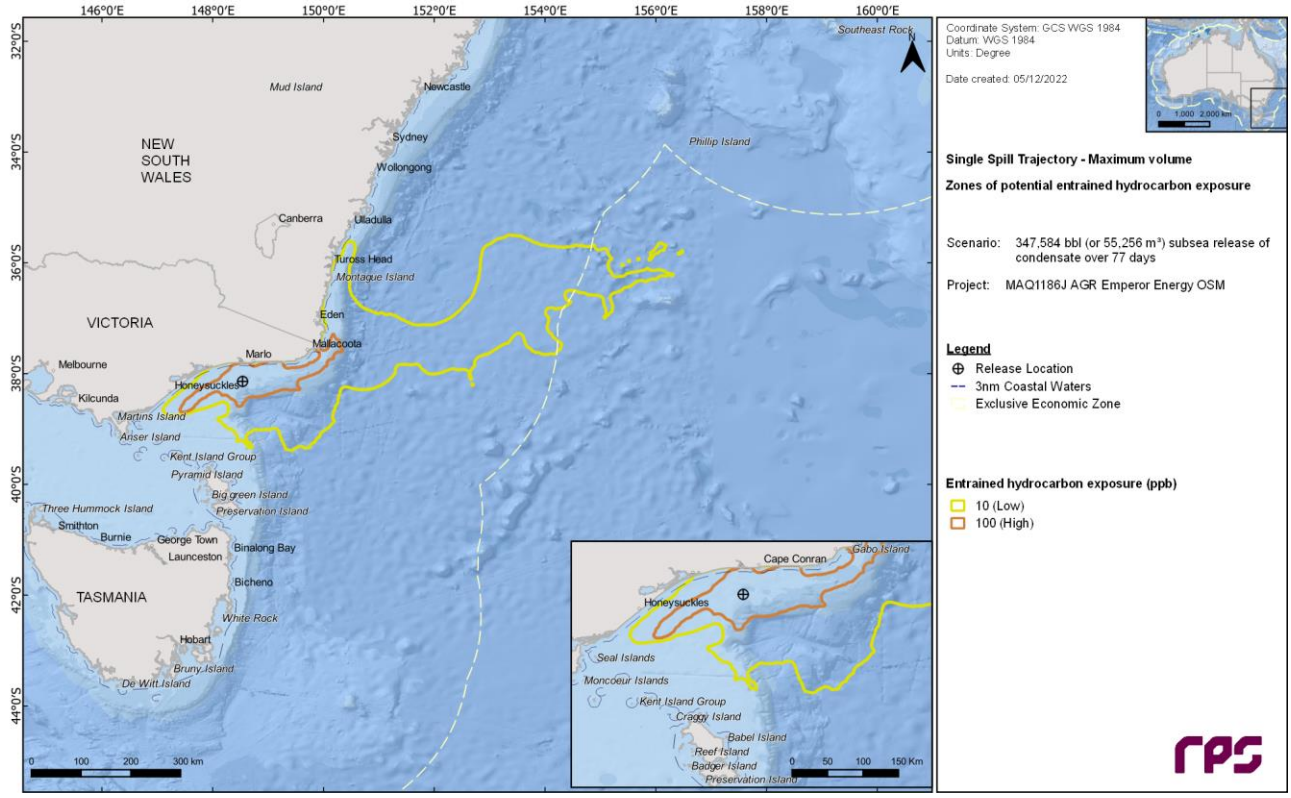


Figure 14.19 Predicted extent of the entrained hydrocarbons exposure over the entire 107 days of the simulation that led to the largest volume of oil ashore from a subsea LOWC.

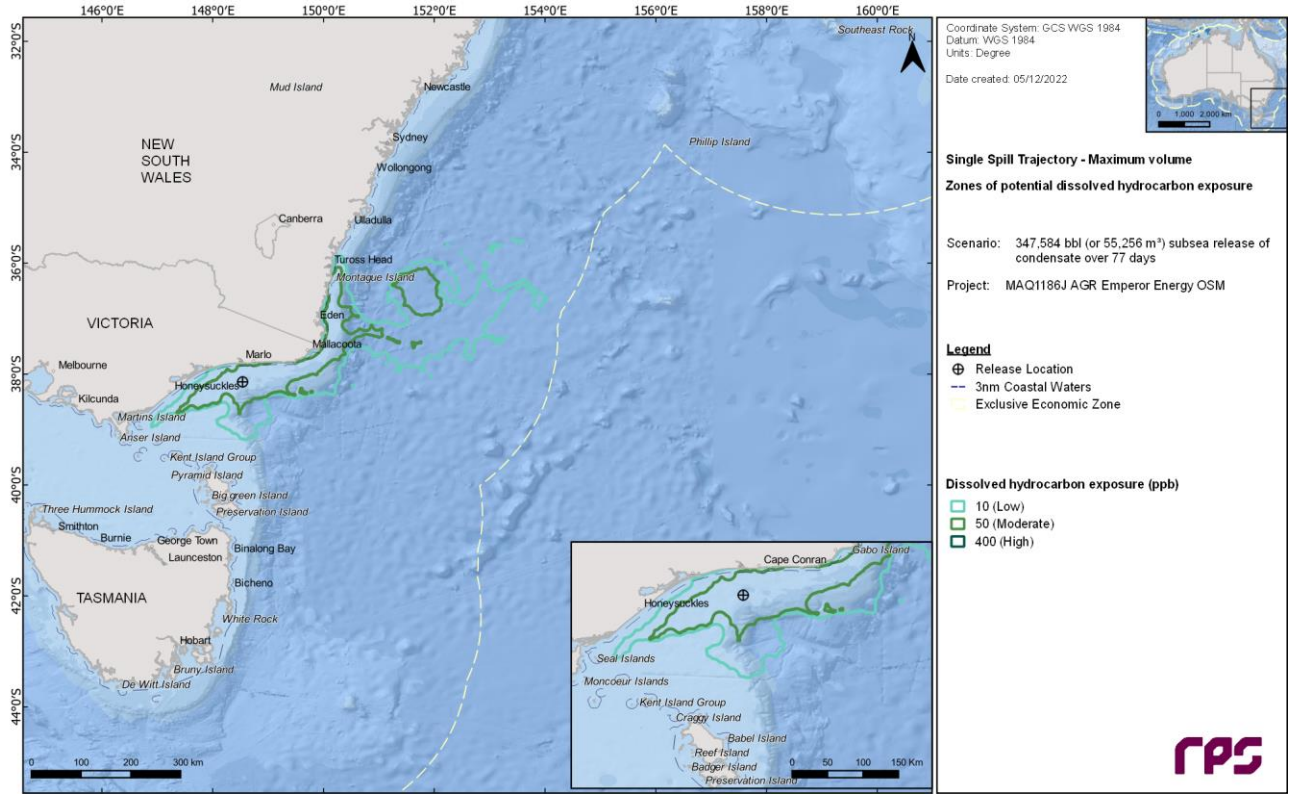


Figure 14.20 Predicted extent of the dissolved hydrocarbons exposure over the entire 107 days of the simulation that led to the largest volume of oil ashore from a subsea LOWC.

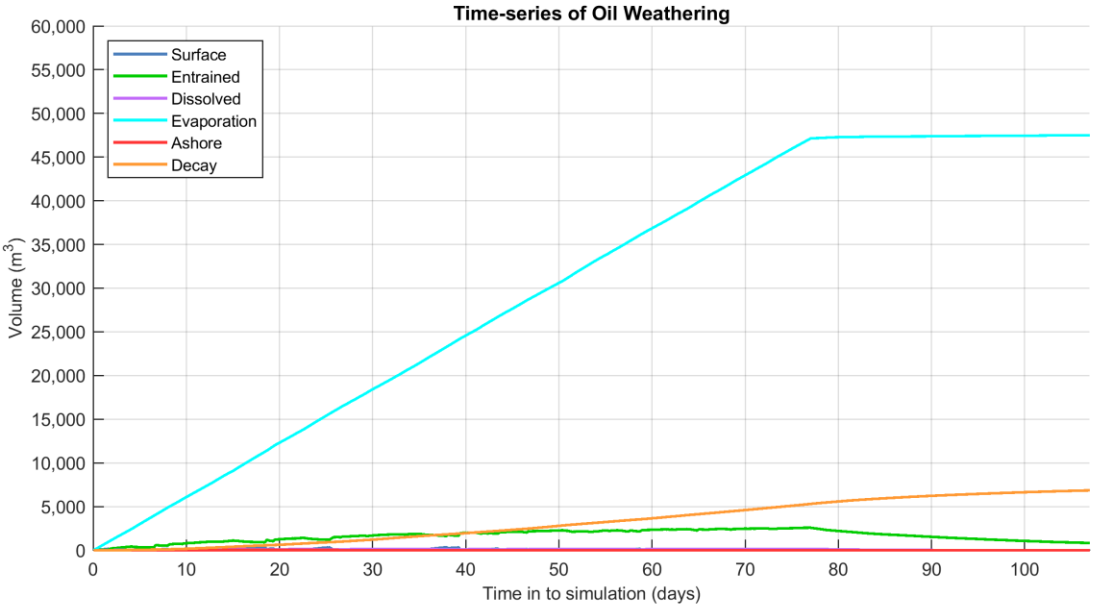


Figure 14.21 Predicted weathering and fates for the simulation that led to the largest volume of oil ashore from a subsea LOWC.

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APPENDIX D STAKEHOLDER CONSULTATION - CORRESPONDENCE SUMMARY

Judith-2 Exploration Drilling Environment Plan Stakeholder Consultation Summary

REVISION	DATE	REASON FOR ISSUE	REVIEWERS	APPROVERS
1	30/08/2026	Updated log to 30/08/2026, corrections to referenced EP commitment references	SM	Emperor Energy
0	18/05/2026	Updated log to 18/05/2026	MB	Emperor Energy
A	09/12/2025	Rev A	MB	Emperor Energy

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1. Overview of Consultation

1.1. Overview

This report summarises the consultation undertaken in preparing the EP for the Judith-2 exploration drilling activity, in accordance with Environment Regulations 24(b). It provides a clear record of engagement with relevant persons, including the chronology of correspondence, key issues raised, and the titleholder's assessment of objections, claims and other feedback. The approach ensures transparency and traceability by linking stakeholder input to regulatory requirements, evaluating the merits of concerns, and documenting measures adopted to address environmental risks and sensitivities. The report also documents that sufficient information was provided to stakeholders and that reasonable timeframes were allowed for informed dialogue, supporting a robust and defensible conclusion that consultation obligations have been met.

Table 1-1: Relevant Persons identified for the activities

Relevant Person	Functions, Interests or Activities	Relevance
25(1)(a) - Commonwealth, State Agency or Authority		
Commonwealth Agency or Authority		
Australian Fisheries Management Authority	Australian Government agency responsible for the management and sustainable use of fisheries resources.	Activity is within a number of Commonwealth fishery areas or will impact or potentially impact a Commonwealth fishery area or resource. AFMA has recommended that Emperor Energy should speak directly with Commonwealth fishery operators and ABARES reports should be reviewed for fishery status. CFA is included in this table as a relevant person. Recent publications were used to determine which Commonwealth fisheries have fishing effort within the activity area (ABARES 2021) (AFMA 2022).
Australian Hydrographic Office	Australian Government agency responsible for providing hydrographic services, enabling safe navigation, maritime trade and supporting protection of the marine environment.	AHO has requested to provide information at least three weeks prior to commencement of any oil and gas activity to allow for publication of notices to mariners and will register Judith-2 well on Navigational Charting products.
Australian Maritime Safety Authority	Australia's national agency responsible for maritime safety, protection of the marine environment, and maritime aviation search and rescue	AMSA has provided shipping activities within the area of the activity. Requested AMSA Joint Rescue Coordination Centre (JRCC) contacted 24-48 hours before activity commences* to promulgate AUSCOAST warning and AHO contacted 4 weeks prior to activities for notice to mariners. *AMSA JRCC will also be notified if the vessel moves out of the area that the broadcast is issued for.
Department of Agriculture, Fisheries and Forestry - Biosecurity (Marine Pests)	Australian Government department responsible for Australia's primary industries.	Responsible for managing biosecurity of incoming goods and conveyances (including biosecurity) in Australia. Responsible for implementation of marine pest and biosecurity within Australian waters (12 nm), including conveyances into Australian waters

Relevant Person	Functions, Interests or Activities	Relevance
Department of Agriculture, Fisheries and Forestry - Biosecurity (Vessels, Aircraft & personnel)	Australian Government department responsible for Australia's primary industries	Potential for introduction of IMS
Department of Agriculture, Fisheries and Forestry – Fisheries	Australian Government department responsible for Australia's primary industries	Activities are within a Commonwealth fishery area and have the potential to impact a Commonwealth fishery area or resource.
Department of Climate Change, Energy, the Environment and Water	Department of the Australian Government responsible for delivering the government's climate change and energy agenda, protecting Australia's environment and water resources, and managing national water infrastructure, including Matters of National Environmental Significance.	The EMBA contains matters of National Environmental Significance which have the potential to be impacted by the activity.
Department of Climate Change, Energy, the Environment and Water - Sea Dumping	Department of the Australian Government that regulates activities like the disposal of waste, the creation of artificial reefs, and the disposal of vessels and other large items at sea under the *Environment Protection (Sea Dumping) Act 1981*.	Activities may be relevant to DCCEEW with respect to waste disposal and/or any P&A activities.
Department of Climate Change, Energy, the Environment and Water - Underwater Cultural Heritage	Department of the Australian Government that administers the Underwater Cultural Heritage Act 2018. DCCEEW regulates activities in relation to protected underwater cultural heritage within Australian waters including the Commonwealth marine area.	Activities may be relevant to DCCEEW as there is potential impact to underwater cultural heritage.
Department of Defence	Australian Government department responsible for Australian Defence Force	May be relevant to the Department as there is potential for training areas or UXO to overlap activities. During consultation, DoD advised there was potential for

Relevant Person	Functions, Interests or Activities	Relevance
		overlap with UXO and that Emperor must understand the risks involved in the activity.
Director of National Parks – Parks Australia	Australian Government department that supports the management of Australian Marine Parks.	The Director of National Parks is a relevant person for consultation where: • the activity or part of the activity is within the boundaries of a proclaimed Australian Marine Park • activities proposed to occur outside a reserve may impact on the values within an Australian Marine Park • an environmental incident occurs in Commonwealth waters surrounding an Australian Marine Park and may impact on the values within the park. During consultation, DNP acknowledged there is no overlap with Australian Marine Parks for this activity.
State Agency or Authority		
Aboriginal Heritage Tasmania	Department that that works to protect and manage the cultural heritage of the Aboriginal people of Tasmania.	Potential for overlap of Tasmanian cultural heritage within the Socio-economic EMBA.
Department of Energy, Environment and Climate Action (DEECA) (VIC)	Victorian department that forms part of the Joint Authority responsible for offshore petroleum in Commonwealth waters	DEECA is part of the offshore Joint Authority that is responsible for key petroleum title decisions in Commonwealth waters. Also plays active role in emergency response in case of state waters impact, particularly in relation to Oiled Wildlife Response and state marine parks
Department of Natural Resources and Environment Tasmania	Department responsible for the sustainable management of the state's natural and cultural resources.	Tasmania natural resources and environment interests and sensitivities may overlap Socio-economic EMBA
Department of Premier and Cabinet - Aboriginal Affairs/Aboriginal Partnerships (Tas)	Supports interests of First Nations peoples in their area	Interests may overlap Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
Department of Premier and Cabinet - First Peoples – State Relations (Vic)	FPSR is a group within Victorian DPC responsible for work in areas of cultural rights, First Nations cultural heritage, self-determination and treaty.	Activities may be relevant to DPC FPSR due to potential risk to submerged cultural heritage within submerged cultural landscapes.
Department of Primary Industries and Regional Development (NSW)	Regional development body promoting business and development	Emergency response activities within the Socio-economic EMBA may affect activities
Department of Transport and Planning (VIC)	Responsible for marine pollution response arrangements in Victorian jurisdiction. DoT coordinates advice with other state agencies involved in marine pollution response including DELWP and port authorities	Considered a stakeholder due to possibility of spill in State waters. Supports and reviews development of OPEP
East Gippsland Catchment Management Authority	Victorian government authority responsible for managing land, biodiversity, and water resources in the easternmost part of Victoria, Australia.	Considered a stakeholder due to possibility of spill in State waters.
East Gippsland Water	Victorian government-owned corporation that provides drinking water and wastewater services to the East Gippsland.	Considered a stakeholder due to possibility of spill in State waters.
Environment Protection Authority Tasmania	Responsible for preparedness and responding to oil and chemical spills in Tasmanian waters. Spill Response 'Control Agency' for any spill that enters (or threatens to enter Tasmanian coastal waters). Tasmania EPA coordinate advice with other state agencies involved in marine pollution response including DPIPWE Fisheries branch and wildlife and conservation branch.	In the event of a marine pollution incident, activities associated with spill response may be required to enter Tasmanian waters. Supports and reviews development of OPEP

Relevant Person	Functions, Interests or Activities	Relevance
Environment Protection Authority Victoria	State's independent environmental regulator, established to protect the community and environment from pollution and waste by enforcing environmental laws and setting standards, including include managing air and water quality, addressing illegal waste dumping, and regulating noise pollution	Considered a stakeholder due to possibility of spill in State waters.
Environment Tasmania	Interest in environment protection	Interests likely overlap Socio-economic EMBA
Gippsland Ports	Government-appointed Committee of Management that manages five local ports and four waterways along the southeastern coastline of Victoria	Considered a stakeholder due to possibility of spill in State waters, and for vessel activities occurring within State waters.
Heritage Victoria	Heritage Victoria regulates and enforces the Victorian Heritage Act 2017, and also acts as the Commonwealth delegate for heritage matters in Commonwealth waters offshore Victoria	Potential for activities to overlap the Socio-economic EMBA. During consultation, Heritage Victoria provided information on UCH shipwrecks found in the region.
Major Projects Foundation Victoria	Research organisation investigating the environmental impacts on Pacific Ocean's marine environments and coastal communities by leaking oil from WWII shipwrecks	Potential for activities to overlap the Socio-economic EMBA
Parks Victoria	Responsible for State marine protected areas within Victorian jurisdiction, and oiled wildlife response.	Engagement is undertaken through Department of Transport and Planning (DTP) – Victoria with respect to OPEP.
Ports Victoria	Victorian Government's statutory authority responsible for leading the strategic management and operational safety of	Considered a stakeholder due to possibility of spill in State waters, and for vessel activities occurring within State waters.

Relevant Person	Functions, Interests or Activities	Relevance
	commercial ports and waterways in Victoria, Australia	
Safe Transport Victoria	The transport safety regulator for Victoria, Australia, responsible for the safety and accreditation of commercial passenger vehicles, buses, and the marine sector.	Offshore activities must comply with regulations for safe navigation and transport of equipment, personnel and materials in Victorian waters.
Southern Rural Water	Victorian Government-owned water corporation that manages water resources, irrigation systems, and supplies water for agriculture, power generation, and some urban needs	Considered a stakeholder due to possibility of spill in State waters.
Transport for NSW	Responsible for marine pollution response arrangements in NSW jurisdiction. Transport NSW coordinate advice with other state agencies involved in marine pollution response including NSW Environment Protection Authority (EPA) and port authorities	In the event of a marine pollution incident, activities associated with spill response may be required to enter NSW waters. Supports and reviews development of OPEP
Victorian Fisheries Authority	Independent statutory authority that manages Victoria's fisheries.	Activities are within a Victorian fishery area or will impact or potentially impact a Victorian fishery area or resource. During consultation, VFA provided data on fisheries relevant to the activity.
Victorian State Parliament	The Victorian State Parliament operates under a system of responsible government, with the Premier as the head of government, supported by a cabinet of ministers who are responsible for different portfolios.	Considered a stakeholder due to activities that occur in State waters and the possibility of spill in State waters.

Relevant Person	Functions, Interests or Activities	Relevance
West Gippsland Catchment Management Authority	State Government authority responsible for managing land and water resources across a large region of Victoria	Considered a stakeholder due to possibility of spill in State waters.
25(1)(d) - Person, Org. that may be affected		
Environment and Conservation Groups		
Australian Coastal Society	Interest in environment protection	Potential for interests to overlap Socio-economic EMBA
Australian Conservation Foundation	Interest in environment protection	Potential for interests to overlap Socio-economic EMBA
Australian Marine Conservation Society	Interest in environment protection	Potential for interests to overlap Socio-economic EMBA
Friends of the Earth Melbourne	Interest in environment protection	Potential for interests to overlap Socio-economic EMBA
Greenpeace Australia	Interest in environment protection	Potential for interests to overlap Socio-economic EMBA
Sea Shepherd Australia	Interest in environment protection	Potential for interests to overlap Socio-economic EMBA
Surfers for Climate	Interest in environment protection	Potential for interests to overlap Socio-economic EMBA
The Wilderness Society	Interest in environment protection	Potential for interests to overlap Socio-economic EMBA
Whale and Dolphin Conservation	Interest in environment protection	Potential for interests to overlap Socio-economic EMBA
Wildlife Victoria	Interest in environment protection	Potential for interests to overlap Socio-economic EMBA
World Wildlife Fund Australia (WWF) -Australia	Interest in environment protection	Potential for interests to overlap Socio-economic EMBA
Fisheries - Body or Agency		

Relevant Person	Functions, Interests or Activities	Relevance
Abalone Council Australia Ltd	Peak body representing Australian Wildcatch Abalone Industry	Activity overlaps management areas in Victoria, Tasmania, and NSW. Active fishing effort is only recorded in Tasmania and Tasmania.
Abalone Victoria Central Zone	Peak body representing interests of Abalone Central Zone entitlement holders	Activity is within the fishery management area but there is no fishing effort.
Australian Southern Bluefin Tuna Industry Association	Peak body representing statutory fishing right owners, holders, fish processors and sellers, and associate members of the Southern Bluefin Tuna Fishery	Activity is within the fishery management area but there is no fishing effort.
Australian WildCatch Fishing	Commercial fishing company based in Lakes Entrance, Victoria that supports Commonwealth South East Trawl Sector.	Activity is within the fishery management area and may overlap fishing effort within the Operational Area.
Commonwealth Fisheries Association	Peak body representing the collective rights, responsibilities and interests of commercial fishing industries in Commonwealth Waters.	Activities overlap with Commonwealth fisheries.
Corner Inlet Fisheries Habitat Association	Peak body representing commercial fishers of the Corner Inlet Fishery.	Potential for activities to overlap the Socio-economic EMBA but there is no fishing effort within the Operational Area.
Eastern Victorian Sea Urchin Divers Association	Peak body representing Eastern Victoria sea urchin fisheries.	Activity is within the fishery management area but there is no fishing effort within the Operational Area.
Eastern Zone Abalone Industry Association	Peak body representing Victoria Eastern Zone abalone fisheries.	Activity is within the fishery management area but there is no fishing effort within the Operational Area.
Game Fishing Association of Victoria	Body representing recreational game fishing in Victoria	Potential for activities to overlap the Socio-economic EMBA
Gippsland Lakes Fishing Club	Body representing recreational fishing within Lakes Entrance	Potential for activities to overlap the Socio-economic EMBA but there is no fishing effort within the Operational Area.
Recreational Fishing Alliance of NSW	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA but there is no fishing effort within the Operational Area.

Relevant Person	Functions, Interests or Activities	Relevance
San Remo Fishermen's Co-operative	Industry body and fishing services provider. Represents views and interests of its members.	Activity overlaps with State fisheries who may be members of the cooperative. Engagement is via SIV.
Seafood Industry Tasmania	Peak body representing the collective rights, responsibilities and interests of commercial fishing industries in Tasmanian state managed fisheries.	Active fishing occurs within Socio-economic EMBA but there is no fishing effort within the Operational Area.
Seafood Industry Victoria (SIV)	Peak industry body representing the interests of fishers operating in Victoria's state fisheries. SIV is the primary contact for State fishers, and covers all Victorian managed fisheries and licence holders	From previous EPs, SIV has expressed interest in seismic, displacement and PSZs. Activities overlap with numerous Victorian State fisheries, which are represented by the peak body SIV. Emperor Energy will have ongoing engagement with SIV with SIV providing a notification to fishers when activities being undertaken.
South East Trawl Fishing Industry Association (SETFIA)	Industry association representing quota owners, fishermen and sellers in the southeast trawl fishery	Activities overlap with State fisheries which SETFIA represent (Southern Shark Industry Alliance, Eastern Rock Lobster and Small Pelagic Fishery Industry Association). Emperor Energy will have ongoing engagement with SETFIA, with SETFIA providing a notification to fishers when activities being undertaken.
Tasmanian Association for Recreational Fishing	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA but there is no fishing effort within the Operational Area.
Tuna Australia	Peak industry body representing the interests of members with licences in the Eastern Tuna and Billfish fishery, he Australian Skipjack fishery and the Southern Bluefin Tuna Industry (non-farming sector)	Activity is within the Eastern Tuna and Billfish fishery, the Australian Skipjack fishery and the Southern Bluefin Tuna fishery. (Australian Skipjack fishery not currently active). Emperor Energy will have ongoing engagement with Tuna Australia, with Tuna Australia providing a notification to fishers when activities being undertaken.
Victorian Scallop Fishermen's Association	A collective of the Scallop Fishing Families and associated support work force based in Lakes Entrance, Victoria. Represents interests of scallop fishermen operating within Australia's south east waters.	Engagement via SIV Activities are within the Bass Strait Scallop Fishery, however VFA data for the OA from 2011 to 2021 shows one vessel fished for one day in 2019. From previous EP consultations, the main concern is seismic surveys.

Relevant Person	Functions, Interests or Activities	Relevance
VRFish	Organisation that represents the interests of recreational fishers in Victoria.	Potential for activities to overlap the Socio-economic EMBA
Fisheries - Commercial		
Lakes Entrance Fishermen's Co-operative Limited	Representative of the Australian fishing industry situated in the South East trawl area of Australia.	Activities overlap with State fisheries who maybe members of the co-operative. Area of concern is restricting access to fishing areas. Engagement will be through SETFIA.
Mitchelson Fisheries	Purse seine fishery operating in Victoria targeting sardines.	Potential for activities to overlap the Socio-economic EMBA
Scallop Fishermen's Association of Tasmania	Industry body that represents licensed commercial scallop operators in Tasmania	Potential for activities to overlap the Socio-economic EMBA, however there is no potential for interaction in the Operational Area. During consultation, the organisation advised the well location is outside of the interest for Bass Strait Central Zone Scallop fishermen.
Southern Rock Lobster Ltd	National peak body representing the Australian Southern Rock Lobster Industry.	Activities overlap management area with fishing effort recorded in Victoria, Tasmania, and NSW.
Southern Shark Industry Alliance –	Industry body representing interests of its Commonwealth-licenced shark gillnet and shark hook members in the Gillnet Hook and Trap Fishery.	Consultation through SETFIA - Activities are within the Southern and Eastern Scalefish and Shark Fishery management area and overlaps the SESSF Danish seine, trawl and gillnet hook and trap sectors where there has been effort. Engagement is via SETFIA.
Trinsand Fisheries	Licence holder in southern squid jig fishery.	Activities are within the eastern zone of the Southern Squid Jig Fishery management.
Fisheries - Recreational		
Marlo Angling Club	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
Victoria Game Fishing Club	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA
Infrastructure Operator		
Port Anthony Renewables	Renewable energy developer	Potential for activities to overlap the Socio-economic EMBA
Port of Hastings Corporation	Port Operator is responsible for managing the operations at the Port of Hastings	Potential for activities to overlap the Socio-economic EMBA
Qube Ports	Port operator	Potential for activities to overlap the Socio-economic EMBA
Local Resident or Group		
Golden Paradise Beach Ratepayers & Residents Association	Not for profit Volunteer Organisation providing a range of services and advocacy for, and on behalf of, the communities of Golden Beach and Paradise Beach, in Gippsland	Potential for interests to overlap Socio-economic EMBA
Individual Persons – IP-1	May have interests within SEAE	Requested to be consulted. Potential for interests to overlap Socio-economic EMBA
Individual Persons – IP-2	May have interests within SEAE	Requested to be consulted. Potential for interests to overlap Socio-economic EMBA
Offshore Energy Operator		
3D Energi Limited	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
Amplitude Energy (Previously Cooper Energy)	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
Blue Mackerel North Pty Ltd	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
CarbonNet Project	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
Carnarvon Hibiscus Pty Ltd	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
Corio Generation	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
Esso Australia	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
GB Energy Limited	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
Iberdrola Australia	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
Liberty Petroleum	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
Navigator North Project	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
Ocean Winds	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
Oceanex	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
Star of the South Offshore Wind Farm	Offshore energy operator	Potential for activities to overlap the Socio-economic EMBA
Other Parties		
Australian Volunteer Coast Guard	Not-for-profit, volunteer-based marine rescue organisation that provides search and rescue services, marine assistance, and training for boaters across Australia	Potential for activities to overlap the Socio-economic EMBA
Port Phillip Sea Pilots	Australian owned company that provides marine pilotage services to commercial vessels in Victorian waters	Potential for activities to overlap the Socio-economic EMBA
Recreational Club or Group		
Boating Industry Association of Victoria	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
Gippsland Lakes Yacht Club	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA
Lakes Entrance Surf Life Saving Club	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA
Life Saving Victoria	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA
Ocean Racing Club of Victoria	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA
Royal Yacht Club of Victoria	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA
Scuba Divers Federation of Victoria	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA
Surfing Victoria	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA
Windsurfing Victoria	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA
Yachting Victoria	Member based organisation representing interest of members who have common pursuits	Potential for activities to overlap the Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
Environment Victoria	Interest in environment protection	Potential for interests to overlap the Socio-economic EMBA
First Peoples' Assembly of Victoria	Elected body for Aboriginal and Torres Strait Islander peoples in Victoria	Potential for interests to overlap the Socio-economic EMBA
Marine and Safety Tasmania	Statutory authority in Tasmania that is responsible for the safe operation of vessels, managing marine facilities, and addressing environmental issues related to vessels	Potential for activities to overlap the Socio-economic EMBA
State Local Council		
NSW Local Government Area / Council: Bayside	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
NSW Local Government Area / Council: Bega Valley	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
NSW Local Government Area / Council: Eurobodalla	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
NSW Local Government Area / Council: Kiama	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
NSW Local Government Area / Council: Mosman	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
NSW Local Government Area / Council: Northern Beaches	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
NSW Local Government Area / Council: Randwick	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
NSW Local Government Area / Council: Shellharbour	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
NSW Local Government Area / Council: Shoalhaven	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
NSW Local Government Area / Council: Sydney	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
NSW Local Government Area / Council: Waverley	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
NSW Local Government Area / Council: Wollongong	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
NSW Local Government Area / Council: Woollahra	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
TAS Local Government Area / Council: Break O'Day	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
TAS Local Government Area / Council: Burnie	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
TAS Local Government Area / Council: Central Coast	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
TAS Local Government Area / Council: Circular Head	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
TAS Local Government Area / Council: Devonport	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
TAS Local Government Area / Council: Dorset	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
TAS Local Government Area / Council: Flinders	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
TAS Local Government Area / Council: George Town	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
TAS Local Government Area / Council: Glamorgan-Spring Bay	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
TAS Local Government Area / Council: Latrobe	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
TAS Local Government Area / Council: Launceston	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
TAS Local Government Area / Council: Tasman	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
TAS Local Government Area / Council: Waratah-Wynyard	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
VIC Local Government Area / Council: Bass Coast Shire	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
VIC Local Government Area / Council: East Gippsland Shire	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
VIC Local Government Area / Council: South Gippsland Shire	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
VIC Local Government Area / Council: Wellington Shire	Local government authority	Possible overlap of ratepayers and residents' activities and interests with Socio-economic EMBA
Tourism - Operator		
Far Out Charters	Recreational fishing charter operating out of Lakes Entrance, Victoria	Potential for activities to overlap the Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
Lakes Charter Fishing	Recreational fishing charter operating out of Lakes Entrance, Victoria	Potential for activities to overlap the Socio-economic EMBA
Peels Cruises	Scenic tours operator in Gippsland Lakes and Surrounds, Victoria	Potential for activities to overlap the Socio-economic EMBA
Traditional Custodians and First Nations nominated representative corporations		
Aboriginal Land Council of Tasmania	Supports interests of First Nations peoples in their area	Interests may overlap Socio-economic EMBA
Bunurong Land Council Aboriginal Corporation	BLCAC is both a PBC and a RAP. Registered Aboriginal Parties (RAPs) are representative corporations, inclusive of all Traditional Owners of an identified Country. Before being granted RAP status, they have undergone a rigorous review process, in which their relationship to Country, the inclusivity of their membership and proven link to Apical Ancestors have been considered. Their registration as a RAP confirms their inherited and fundamental role to speak for Country and Culture within their registration area.	Interests may overlap Socio-economic EMBA.
Circular Head Aboriginal Corporation	Supportive body for the Aboriginal community of Circular Head in Tasmania	Interests may overlap Socio-economic EMBA
First Tasmanians Aboriginal Corporation	Body established to assist recognition of Tasmanian Indigenous heritage, promote culture and provide support	Interests may overlap Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
Flinders Island Aboriginal Association	Aboriginal Community Controlled Organisation to support Aboriginal community in Flinders Island Tasmania	Interests may overlap Socio-economic EMBA
Gunaikurnai Land & Waters Aboriginal Corporation	BLCAC is both a PBC and a RAP. Registered Aboriginal Parties (RAPs) are representative corporations, inclusive of all Traditional Owners of an identified Country. Before being granted RAP status, they have undergone a rigorous review process, in which their relationship to Country, the inclusivity of their membership and proven link to Apical Ancestors have been considered. Their registration as a RAP confirms their inherited and fundamental role to speak for Country and Culture within their registration area.	Traditional Custodians of the Sea Country overlapping the Operational Area - Interests may overlap Socio-economic EMBA. On-going consultation is being conducted with GLaWAC. No objections or claims have been raised.
Lake Tyers Aboriginal Trust	organisation that holds and manages former Aboriginal reserve land at Lake Tyers in eastern Victoria.	Interests may overlap Socio-economic EMBA
Melaythenner Teeackana Warrana Aboriginal Corporation	A not-for-profit organisation with operations centered on Tebrakunna Country (Cape Portland) in Trouwunna (Tasmania).	Interests may overlap Socio-economic EMBA
New South Wales Aboriginal Land Council	Supports the functions of individual Local Aboriginal Land Councils.	Interests of LALCs may overlap Socio-economic EMBA. During consultation, provided contact details for individual LALCs that may be impacted by the Socio-economic EMBA
NSW Local Aboriginal Land Council: Awabakal	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal	Interests may overlap Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
	Culture and Heritage, a Local Aboriginal Land Council has the following functions: (a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	
NSW Local Aboriginal Land Council: Bahtabah	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions: (a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	Interests may overlap Socio-economic EMBA
NSW Local Aboriginal Land Council: Batemans Bay	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions:	Interests may overlap Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
	(a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	
NSW Local Aboriginal Land Council: Bega	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions: (a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	Interests may overlap Socio-economic EMBA
NSW Local Aboriginal Land Council: Bodalla	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions:	Interests may overlap Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
	(a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	
NSW Local Aboriginal Land Council: Cobowra and Murramarang	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions: (a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	Interests may overlap Socio-economic EMBA
NSW Local Aboriginal Land Council: Darkinjung	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions:	Interests may overlap Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
	(a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	
NSW Local Aboriginal Land Council: Eden	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions: (a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	Interests may overlap Socio-economic EMBA
NSW Local Aboriginal Land Council: Illawarra	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions:	Interests may overlap Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
	(a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	
NSW Local Aboriginal Land Council: Jerrinja	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions: (a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	Interests may overlap Socio-economic EMBA
NSW Local Aboriginal Land Council: La Perouse	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions:	Interests may overlap Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
	(a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	
NSW Local Aboriginal Land Council: Merrimans	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions: (a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	Interests may overlap Socio-economic EMBA
NSW Local Aboriginal Land Council: Metropolitan	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions:	Interests may overlap Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
	(a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	
NSW Local Aboriginal Land Council: Mogo	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions: (a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	Interests may overlap Socio-economic EMBA
NSW Local Aboriginal Land Council: Ngambri	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions:	Interests may overlap Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
	(a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	
NSW Local Aboriginal Land Council: Nowra	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions: (a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	Interests may overlap Socio-economic EMBA
NSW Local Aboriginal Land Council: Ulladulla	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions:	Interests may overlap Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
	(a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	
NSW Local Aboriginal Land Council: Wagonga	Under the NSW Aboriginal Land Rights Act 1983, under s52 in relation to Aboriginal Culture and Heritage, a Local Aboriginal Land Council has the following functions: (a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law, (b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area. In accordance with s62 a function of the board of an LALC is to direct and control the affairs of the Council.	Interests may overlap Socio-economic EMBA
Six Rivers Aboriginal Corporation	A not-for-profit organisation in north-west Tasmania that supports and empowers the Aboriginal community through various programs and initiatives	Interests may overlap Socio-economic EMBA
Tasmanian Aboriginal Centre	Supports interests of First Nations peoples in their area	Interests may overlap Socio-economic EMBA

Relevant Person	Functions, Interests or Activities	Relevance
Victorian Aboriginal Corporation for Languages	Peak body for Aboriginal language revitalisation in Victoria	Interests may overlap Socio-economic EMBA
Victorian Aboriginal Heritage Council	Supports interests of First Nations peoples in their area	Interests may overlap Socio-economic EMBA
25(1)(e) - Other relevant person or organisation		
Other Parties		
Australian Marine Oil Spill Centre	Australia's major marine oil spill response and training provider	Principal marine oil spill response facility that supports oil spill response and reviews development of OPEP
Fathom Pacific	Scientific consulting and research firm.	Potential for activities to overlap the Socio-economic EMBA
iXblue	Provider of maritime, navigation, imaging and positioning solutions	Potential for activities to overlap the Socio-economic EMBA
Tourism – Body or Agency		
Australian Tourism Industry Council	Body representing tourism interests in designated region	Unplanned event such as hydrocarbon release might affect business interests
Destination Gippsland	Body representing tourism interests in designated region	Unplanned event such as hydrocarbon release might affect business interests
Tourism Tasmania	Body representing tourism interests in designated region	Unplanned event such as hydrocarbon release might affect business interests
Victorian Tourism Industry Council	Body representing tourism interests in designated region	Unplanned event such as hydrocarbon release might affect business interests
Visit Northern Tasmania	Body representing tourism interests in designated region	Unplanned event such as hydrocarbon release might affect business interests
West by North West	Body representing tourism interests in designated region	Unplanned event such as hydrocarbon release might affect business interests

2. 25(1)(a) - Commonwealth, State Agency or Authority

2.1.Commonwealth Agency or Authority

2.1.1. Australian Fisheries Management Authority

Summary of consultation effort and relevant person responses
• [AFMA-01] Emailed on 16/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [AFMA-02] Emailed on 24/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#15] Emperor emailed a staff member on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#187] AFMA emailed on 21/10/2025, advising AFMA has no direct comments on the EP, but would like to be included in future consultation on the project. AFMA encouraged Emperor to talk directly with Commonwealth fishing operators and relevant person in the area if this has not already been done. Advised AFMA maintains a list of fishing organisations on their website/ Provided updated contact details for AFMA. • [#188] Emperor Energy emailed on 21/10/2025, thanked AFMA for the response and advised Emperor will keep AFMA informed with project updates. Advised that Emperor has been in contact with all the Commonwealth fisheries organisations that AFMA provided, with the exception of the Southern Bluefin Tuna Fishery, which Emperor advised they will be in contact with (However, ASBTIA has been engaged since 2023 as per #ASBTIA-01). Welcomed further feedback. • [#220] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• AFMA advised Emperor to engage directly with Commonwealth fisheries and relevant persons in the area. • Advised they have no direct comments on the EP but would like to be included in future consultation	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy advised to keep AFMA informed with project updates, and advised that contact has been made with all the Commonwealth fisheries organisations that AFMA provided, with the exception of the	• Emperor Energy has assessed the potential for interaction with Commonwealth Fisheries and has notified relevant fisheries within the EP.

• Advised that consultation with Commonwealth fishing operators should be undertaken.		Southern Bluefin Tuna Fishery, which Emperor advised they will be in contact with (However, ASBTIA has been engaged since 2023 as per #ASBTIA-01).	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

2.1.2. Australian Hydrographic Office

Summary of consultation effort and relevant person responses
• [AHO-01] Emperor Energy emailed on 30/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [AHO-02] AHO emailed on 02/01/2025, acknowledged receiving data of Judith-2 well location to be registered on Navigational Charting products. o No claims or queries raised. o Measures adopted: advise agreed and will be followed. • [AHO-03] AHO emailed on 23/01/2025, advised AHO has no concerns with any Judith-2 activities. Provided link to fact sheet on reporting maritime activities. Advised contact with AHO is only required once activity commences. o Measures adopted: Advice agreed and captured in Section 7.10 Commitment and Notification Management. • [AHO-04] Emperor Energy emailed on 24/01/2025, confirmed AHO requirements for AHO notifications. Queried notification period for AHO. • [AHO-05] AHO emailed on 28/01/2025, confirmed notification period of 21 days prior to activity commencing. o Measures adopted: Advice agreed and captured in Section 7.10 Commitment and Notification Management. • [#16] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

- [#221] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.
- [#397] AHO emailed 25/11/205, stating they have no concerns with the Judith-2 activity. Stated that AHO only require updates once activity is due to commence.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• AHO advised Judith-2 well location to be registered on Navigational Charting products. • AHO provided link to fact sheet on reporting maritime activities. • AHO advised contact with AHO is only required once activity commences with 21 day notification period. • AHO advised there are no concerns with the activities associated with this EP.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy confirms to follow the notification requirements of Activity commencing (21 day period notice).	• Emperor Energy confirms to follow the notification requirements of Activity commencing (21 day period notice) as captured in Section 7.10 Commitment and Notification Management.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in December 2024; no additional time has been requested.

2.1.3. Australian Maritime Safety Authority

Summary of consultation effort and relevant person responses

- [AMSA-01] Emperor Energy emailed on 16/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

- [AMSA-02] AMSA emailed on 21/12/2022, AMSA replied to the introduction email to inform on distribution of Maritime Safety Information to recommended agencies. Also to ensure vessels comply with COLREGs.
  - Measures adopted: Advice agreed and captured in Section 5.5.5
- [AMSA-03] Emperor emailed on 21/12/2022, replied to confirm these requirements will be included in the Judith-2 Exploration Drilling Environment Plan.
- [AMSA-04] Emperor Energy Emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Checked as to whether prior advise remained current.
- [AMSA-05] AMSA emailed 26/11/2024, AMSA provided details of further agencies to consult or notify and regulations to comply with suggested timeframes before activities commence.
  - Measures adopted: Advice agreed captured in Section 7.10 Commitment and Notification Management and other agency consulted.
- [AMSA-06] Emperor Energy emailed on 27/11/2024, Confirmed that Emperor Energy will comply with requirements.
- [#3] Emperor energy emailed AMSA contacts on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#224] Emperor Energy emailed AMSA contact 19 on 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.
- [#226] Emperor Energy emailed AMSA contact 18 on 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• AMSA informed distribution on maritime safety information to recommended agencies. • AMSA advised of suggested timeframes for notifying recommended agencies before activities commence.	• No claims or objections were raised. Emperor confirmed that distribution of safety information will be distributed to relevant agencies. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	• Advice agreed and captured within Section 7.10 Commitment and Notification Management of the EP.	• Measures adopted. Advice agreed and captured in Section 7.10 Commitment and Notification Management.

• AMSA advised to ensure vessels comply with COLREGs.	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

2.1.4. Department of Agriculture, Fisheries and Forestry - Biosecurity (Marine Pests)

Summary of consultation effort and relevant person responses
• [DAFF-MP-01] Emperor Energy emailed on 19/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [DAFF-MP-02] Emperor Energy emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Checked as to whether prior advice remained current. • [#86] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#236] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

2.1.5. Department of Agriculture, Fisheries and Forestry - Biosecurity (Vessels, Aircraft & personnel)

Summary of consultation effort and relevant person responses
• [DAFF-VAP-01] Emperor Energy emailed on 19/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [DAFF-VAP-02] Emperor Energy emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Checked as to whether prior advice remained current. • [DAFF-VAP-03] DAFF emailed on 24/11/2024, undelivered email return – no response. • [#84] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#193] DAFF emailed on 13/10/2025, undelivered email return – no response.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested. Initial email delivered successfully, recent follow up email bounced, and alternate email contact could not be found. But emails to DAFF Biosecurity Marine Pests was successful.

2.1.6. Department of Agriculture, Fisheries and Forestry – Fisheries

Summary of consultation effort and relevant person responses			
• [DAFF-FISH-01] Emperor Energy emailed on 16/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [DAFF-FISH-02] Emperor Energy emailed on 02/07/2023, to follow up on introduction email. • [DAFF-FISH-03] Emperor Energy emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Checked as to whether prior advice remained current. • [#8] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#237] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.			

2.1.7. Department of Climate Change, Energy, the Environment and Water

Summary of consultation effort and relevant person responses			
• [#14] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#239] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy has assessed the potential for interaction with Commonwealth Fisheries and has notified relevant fisheries within the EP. • Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

2.1.8. Department of Climate Change, Energy, the Environment and Water - Sea Dumping

Summary of consultation effort and relevant person responses
• [#85] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

• [#238] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

2.1.9. Department of Climate Change, Energy, the Environment and Water - Underwater Cultural Heritage

Summary of consultation effort and relevant person responses
• [UCHD-01] Emperor Energy emailed on 12/06/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [UCHD-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#18] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#88] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#240] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in June 2023; no additional time has been requested.			

2.1.10. Department of Defence

Summary of consultation effort and relevant person responses
• [DOD-01] Emperor Energy emailed on 21/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. o A map showing title details, OA and defence areas and potential UXO was also included. • [DOD-02] DoD emailed on 23/01/2023, DoD replied to the introduction email to notify that proposed operations are located outside Defence Training Areas and restricted airspace. However, DoD advised that UXO may be present on the seafloor, and Emperor Energy must understand the risks associated. DoD also advised liaison with AHS for Notices to Mariners, in particular notifying AHS 3-weeks prior to commencement of activities. o Measures adopted: Advice agreed and captured in Section 5.4.6. • [DOD-03] Emperor Energy emailed on 23/02/2023, replied to confirm these requirements will be actioned. • [DOD-04] Emperor Energy emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#17] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

- [#241] Emperor Energy emailed stakeholder 54 on 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.
- [#242] Emperor Energy emailed stakeholders on 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.
- [#395] DoD emailed on 24/11/2025. DoD, no concerns raised. Asked to be kept informed when activities commence.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Confirmed activity is located outside of Defence Training Areas and Restricted Airspace. • Advised that UXO may be present on the seafloor and Emperor must understand risks associated. • Advised to liaise with ASH for notice to mariners. • No claims or objections were raised, requested to be informed when activity commences.	• No objections or claims were raised in regards to the activity • DoD advised there may be UXO present on the seafloor and Emperor must understand the risk involved and adopt measures to reduce the risk. • Emperor energy has implemented measures and controls to reduce risks from UXO to ALARP • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Confirmed mitigation for UXO would be adopted and included within the Environment Plan with control measures adopted, and relevant agencies including AHS to be notified prior to the activity.	• Measures adopted: Advice agreed and captured in Section 5.4.6 UXO advice captured with CM31 Site Survey and CM32 MODU move and positioning analysis to assess for and avoid UXOs.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

2.1.11. Director of National Parks – Parks Australia

Summary of consultation effort and relevant person responses
• [DNP-01] Emperor Energy emailed on 19/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.   o A map showing AMPs within OA and Hydrocarbon Exposure Area was also included. • [DNP-02] Emperor Energy emailed on 13/12/2024, provided package of data in line with the NOPSEMA/DNP consultation guidance note: *Petroleum activities and Australian Marine Parks*. • [DNP-03] DNP emailed on 13/12/2024, undelivered email. No response. • [DNP-04] DNP emailed on 10/01/2025, acknowledged that Judith-2 activities do not overlap Australian Marine Parks and does not require authorisation or further action from DNP. Advised that the EP follows the objectives and values complying with marine parks. Sought further advise on the activities that occur within the operational area. Provided information in the case that a hydrocarbon incident occur and may impact a marine park. Advised that further notification is not required.   o Advice agreed and acknowledged and already captured in EP. • [DNP-05] Emperor Energy emailed on 21/01/025, confirmed EP complies with marine park management and confirmed operational area activities. Confirmed hydrocarbon incident notification requirements and procedures. • [#24] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#42] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#90] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#192] Parks Australia emailed on 13/10/2025, automatic undelivered email response. • [#249] Emperor Energy emailed stakeholder 72 on 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party. • [#250] Emperor Energy emailed stakeholder 71 on 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party. • [#315] Emperor Energy emailed Parks Australia on 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

- [#383] Parks Australia emailed on 21/11/2025, to confirm that the Judith-2 Activity does not overlap any Australian Marine Parks and the associated impacts remain unchanged. Advised they have no additional comments beyond those provided in 10 January 2025.
- [#382] Emperor Energy emailed on 24/11/2025, requested whether Parks Australia would still like to be engaged on the project.
- [#391] Parks Australia emailed on 24/11/2025, confirming Parks Australia would like to be removed from consultation list.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• DNP acknowledged that Judith-2 does not overlap AMPs and EP complies with objectives and values of AMPs. • Requested further information on activities occurring within the Operational Area. • Provided information in the case that a hydrocarbon incident might impact an AMP. • DNP advised they do not require authorisation or further action from DNP. • Advised further notification is not required and to be removed from the consultation list.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor confirmed that the EP complies with park management. • Emperor provided more information on activities occurring within the Operational Area. • Emperor confirmed hydrocarbon incident notification requirements and procedures. • Emperor confirms no further notifications are required, unless a hydrocarbon incident impacts an AMP.	• Measures were adopted and advice agreed on and captured within Section 5.9. The impacts to Australian Marine Parks have been reduced to ALARP through measures adopted in the EP. • Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Information provided in the form requested by relevant person.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2024; no additional time has been requested.

2.2.State Agency or Authority

2.2.1. Aboriginal Heritage Tasmania

Summary of consultation effort and relevant person responses			
• [#81] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#215] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

2.2.2. Department of Energy, Environment and Climate Action (VIC)

Summary of consultation effort and relevant person responses
• [VIC-DJPR-01] Emperor Energy emailed on 19/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-DJPR-02] DEECA replied to the email on 19/12/2022, out of office message with additional email provided in message. • [VIC-DJPR-03] Emperor Energy forwarded the intro email on 19/12/2022 to the additional email address provided, but the email bounced back.

- [VIC-DJPR-04] DEECA emailed on 9/1/2023 with a read receipt from staff member.
- [VIC-DJPR-05] Emperor Energy emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. The email also checked as to whether proposed notifications were appropriate.
- [VIC-DJPR-06] Email bounced back from DEECA on 24/11/2024.
- [VIC-DJPR-07] Emperor Energy emailed on 23/02/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. The email also checked as to whether proposed notifications were appropriate.
- [VIC-DJPR-08] DEECA emailed on 24/02/2024, acknowledging receipt of email and advised they would be in touch should they have any questions.
- [#158] Emperor Energy emailed on 14/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Also provided an opportunity to meet.
- [#243] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• DEECA advised that they they would be in touch should they have any questions. No information requests made. • No objections or claims.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested. Several emails sent from Emperor Energy that were not received, however, subsequent attempts successful.

2.2.3. Department of Natural Resources and Environment Tasmania

Summary of consultation effort and relevant person responses			
• [#87] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#244] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

2.2.4. Department of Premier and Cabinet - Aboriginal Affairs/Aboriginal Partnerships (Tas)

Summary of consultation effort and relevant person responses
• [TAS-DPAC-01] Emperor Energy emailed on 20/03/2023 advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAS-DPAC-02] Emperor Energy emailed on 24/11/2024 advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

• [#19] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#245] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in March 2023; no additional time has been requested.			

2.2.5. Department of Premier and Cabinet - First Peoples – State Relations (Vic)

Summary of consultation effort and relevant person responses			
• [VIC-FPSR-01] Emperor Energy emailed on 30/12/2024 advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-FPSR-02] First Peoples State Relations replied to the email on 30/12/2024, auto-reply.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2024; no additional time has been requested.

2.2.6. Department of Primary Industries and Regional Development (NSW)

Summary of consultation effort and relevant person responses
• [DPIRD-01] Emperor Energy emailed on 11/05/2023, with a formal request for fishing data. • [DPIRD-02] Primary Industries emailed on 19/05/2023, asking for informal action of request. • [DPIRD-03] Emperor Energy replied to email on 19/05/2023, accepting informal action. • [DPIRD-04] Primary Industries emailed on 24/05/2023, fishing data received as email attachment. • [DPIRD-05] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [DPIRD-06] Primary Industries emailed on 17/12/2024, confirming activity is not relevant to NSW Resources. • [#20] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#246] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Primary Industries provided fishing data upon request from Emperor Energy.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

• Primary Industries noted that the activity is not relevant to NSW Resources. • No objections or claims.	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Activity not considered relevant by the department. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in March 2023; no additional time has been requested.

2.2.7. Department of Transport and Planning (VIC)

Summary of consultation effort and relevant person responses
• [VIC-DTP-01] Emperor Energy emailed on 19/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-DTP-02] Vic DTP emailed on 10/02/2023, with invitation to an initial online meeting as part of the consultation. • [VIC-DTP-03] Emperor Energy emailed on 16/02/2023, stating Emperor Energy will be in touch to arrange the meeting. • [VIC-DTP-04] Vic DTP replied to the email on 17/02/2023, acknowledging email. • [VIC-DTP-05] Emperor Energy attended a meeting on 22/05/2023 with DoT staff members and presented the modelling overview of hydrocarbon properties and response. • [VIC-DTP-06] Emperor Energy emailed on 24/06/2023, follow up email to meeting in May. Provided draft of OPEP and information on hydrocarbon properties. • [VIC-DTP-07] Vic DTP emailed on 28/06/2023, confirming receipt and provided date for the OPEP review to be 14/07/2023. • [VIC-DTP-08] Vic DTP emailed on 12/07/2023, requesting an extension of the OPEP review to 21/07/2023. • [VIC-DTP-09] Emperor Energy replied to the email on 12/07/2023, confirming extension of OPEP review. • [VIC-DTP-10] Vic DTP emailed on 21/07/2023, providing review of OPEP with comments to update Vic DTP department details and capacities. • [VIC-DTP-11] Emperor Energy emailed on 2/01/2025, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-DTP-12] Vic DTP replied to email on 02/1/2025, auto-reply for staff member supplying alternative email address.

- [VIC-DTP-13] Emperor Energy forwarded the same email on 2/01/2025, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [VIC-DTP-14] Vic DTP replied to email on 2/01/2025, auto-reply for staff member.
- [VIC-DTP-15] Vic DTP emailed on 3/01/2025, acknowledging receiving of information sheet and OPEP, and advised a review would be provided by the end of January.
- [VIC-DTP-16] Emperor Energy replied to email on 5/01/2025, acknowledging response from Vic DTP.
- [VIC-DTP-17] Vic DTP replied to email on 5/01/2025, auto-reply for staff member.
- [VIC-DTP-18] Vic DTP replied to email on 10/01/2025, and supplied emergency contact details for Vic DTP.
- [#22] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#200] Vic DTP emailed on 14/10/2025 notifying Emperor Energy of new contact details for relevant person.
- [#157] Emperor Energy emailed on 14/10/2025, acknowledging department member was no longer with the department and thanked them for including the relevant person in the email. Advised the EP and OPEP was being updated and Emperor Energy welcomes their feedback. Requested to arrange a call to meet.
- [#210] Vic DTP emailed on 11/11/2025, providing copy of Victorian Joint Industry and State Oil Pollution Response guidance note to help with the OPEP update. Guidance plan states that it should be read in conjunction with the Victorian State Emergency Management Plan (SEMP) and State Maritime Emergencies (non-search and rescue) Subplan.
- [#247] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Vic DTP reviewed OPEP with comments to update Vic DTP department details and capacities. • Vic DTP supplied emergency contact details for Vic DTP. • Vic DTP notified Emperor Energy of new contact details for relevant person. • Vic DTP provided Victorian Joint Industry and State Oil Pollution	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy updated OPEP with updated information from Vic DTP on department details, capacities and emergency contact details. • Contact made with relevant person using updated contact details provided by Vic DTP. •	• Emperor Energy updated OPEP with updated information from Vic DTP on department details, capacities and emergency contact details.

Response guidance note to help with the OPEP update			

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided along with draft OPEP. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

2.2.8. East Gippsland Catchment Management Authority

Summary of consultation effort and relevant person responses
• [#89] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#252] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

2.2.9. East Gippsland Water

Summary of consultation effort and relevant person responses			
• [#92] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#251] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

2.2.10. Environment Protection Authority Tasmania

Summary of consultation effort and relevant person responses
• [TAS-EPA-01] Emperor Energy attended a meeting with Dept. of Tasmania staff members and presented the modelling overview of hydrocarbon properties and response. No objections or claims. • [TAS-EPA-02] Emperor Energy emailed on 24/05/2023, thanking Tas EPA for the meeting to discuss oil spill strategies. Attached a copy of the hydrocarbon response slideshow from the meeting and provided overview. Requested EPA response on state of degraded hydrocarbons with RPS and requested EPA to provide sensitive resource maps and requested EPA to validate OPEP response strategy for NEBA.

- [TAS-EPA-03] Emperor Energy emailed on 24/06/2023, following up on the previous email with draft OPEP Rev B 2023. Provided response to form of degraded hydrocarbon that would reach the shoreline would be a very low pour point (-50C) for this condensate and the wax content is <0.5% - RPS who conducted the trajectory modelling advised it would be in the form of an oil stain on the shorelines
- [TAS-EPA-04] Emperor Energy emailed on 10/07/2023, following up on the previous email on 24/06/2023.
- [TAS-EPA-05] Dept. of Tasmania replied to the email on 10/07/2023, requesting information on deadline of OPEP review.
- [TAS-EPA-06] Emperor Energy replied on 10/07/2023 and provided the deadline of the OPEP review for the end of July.
- [TAS-EPA-07] Dept. of Tasmania replied on 10/07/2023, confirming review could be completed by end of July.
- [TAS-EPA-08] Emperor Energy replied on 10/07/2023 and provided an opportunity to speak over the phone.
- [TAS-EPA-09] Emperor Energy emailed on 2/01/2025, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website
- [TAS-EPA-10] Dept. of Tasmania replied to email on 2/01/2025, auto-reply.
- [TAS-EPA-11] Emperor Energy emailed on 24/01/2025, follow up email on progression of OPEP review.
- [#26] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#253] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Emperor Energy attended a meeting with Tas EPA to provide overview of hydrocarbon properties and response. No objections or claims • Tas EPA confirmed capacity to review OPEP and provided date range in 2023. Tas EPA was unable to provide a review of the OPEP prior to submission and did not request additional time. • No objections or claims raised	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy attended a meeting with Tas EPA to provide overview of hydrocarbon properties and response • Requested EPA response on state of degraded hydrocarbons with RPS and requested EPA to provide sensitive resource maps . • Provided response to query on form of degraded hydrocarbon that would reach the shoreline would be a very low pour point (-50C) for this	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

		condensate and the wax content is <0.5% - RPS who conducted the trajectory modelling advised it would be in the form of an oil stain on the shorelines • Emperor Energy provided copy of OPEP for review in 2023 and 2025. Tas EPA was unable to provide a review of the OPEP prior to submission and did not request additional time.	

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided along with draft OPEP. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in March 2023; no additional time has been requested. Opportunities provided to discuss over the phone with no response provided.

2.2.11. Environment Protection Authority Victoria

Summary of consultation effort and relevant person responses
• [#91] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#254] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised.	N/A	• Emperor Energy considers the measures and controls in the EP

	• Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.		addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

2.2.12. Environment Tasmania

Summary of consultation effort and relevant person responses			
• [TAS-ET-01] Emailed 1/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAS-ET-02] Emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#29] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

2.2.13. Gippsland Ports

Summary of consultation effort and relevant person responses			
• [#97] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#265] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

2.2.14. Heritage Victoria

Summary of consultation effort and relevant person responses
• [VIC-HV-01] Emperor Energy emailed on 30/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-HV-02] Heritage Victoria replied to the email on 30/12/2024, acknowledging the email from Emperor Energy and noted a 30 day consultation response period. • [VIC-HV-03] Heritage Victoria emailed on 29/01/2025, providing information on UCH shipwrecks that are found within the region. Recommended a historic UCH study and submerged Aboriginal cultural heritage study undertaken by a qualified maritime archaeologist and appropriate specialists to identify UCH values in the area. The email also requested to review the EP when open for public consultation. • [VIC-HV-04] Emperor Energy emailed on 4/02/2025, confirming that UCH shipwrecks within 50 km of operational area have been listed. Noted the likelihood of Aboriginal UCH is low given the location and cited Environmental Protection Outcomes and control measures related to this impact. Also advised that Emperor had not engaged a qualified maritime archaeologist. • [#27] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#408] Emperor Energy online meeting 26/03/2026 with Heritage Victoria to provide project timeline update and specifically to address cultural and archaeological heritage issues as previously raised by HV. Emperor provided an overview of the EP updates around the desktop studies completed and the plans for the post geophysical survey analysis of the dataset to identify any possible cultural or archaeological heritage items on/ below the seabed. EHV understood the proposed activity and evaluation process for identification of any possible UCH. Action to share the updated EP sections and short presentation on the operational plans. • [#409] Emperor Energy emailed on 31/03/2026, summary of the previous meeting and details on the proposed UCH process. • [#411] Emperor Energy re-sent above email [#409] on 15/04/2026, previous email was undelivered. • [#412] Heritage Victoria email reply on 16/04/2026 confirming receipt of previous email and materials. • [#413] Emperor Energy emailed follow-up request to Heritage Victoria on 07/05/2026. • [N/A] Heritage Victoria automated reply on 07/05/2026, flagging possible delayed response (due to personnel availability/ sickness). Email not included in this confidential summary report. • [#414] Heritage Victoria email reply on 08/05/2026, providing their feedback on the proposed process for the discovery of UCH during and after the Geophysical Survey. • [#415] Emperor Energy emailed reply on 08/05/2026 that they shall evaluate the HV feedback [#414] and revert next week. • [#416] Emperor Energy emailed reply on 11/05/2026 to Heritage Victoria, detailing our response to their suggested strengthening of controls for the identification and reporting of any UCH.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Heritage Victoria provided information on UCH shipwrecks that are found within the region. [VIC-HV-03] • Heritage Victoria recommended a historic UCH study and submerged Aboriginal cultural heritage study undertaken. VIC-HV-03] •	• Information on UCH Shipwrecks included into the EP. • Suggestion of a Marine Archaeologist being engaged (at this stage), was rejected due to the understanding of the existing environment and the limited additional information available (such as a geophysical survey) in the area. • The UCH Specialist/ Marine Archaeologist was planned to be utilised to review the Geophysical Survey data. • No other claims or objections were raised. •	• Emperor confirmed that UCH shipwrecks within 50 km of operational area have been listed. [#VIC-HV-04] • Emperor confirmed that a Marine Archeologist would not be commissioned for this phase of the EP preparation. [#VIC-HV-04 •	• Measures adopted: Appointment of appropriately qualified underwater archaeologist to review geophysical survey data gathered prior to finalising approach path, well location and MODU position (CM32), avoidance of identified maritime archaeological heritage and submerged archaeological heritage (CM35), and any new archaeological finds will be reported to the Australasian Underwater Cultural Heritage Database (AUCHD) within 21 days of discovery.
• HV suggested further strengthening of specific UCH Act clause references requested and adopted within the control measures [#414] • • No further objections or claims raised.	• Five of six suggested improvements were fully adopted as practical improvements to existing CM or EPS. • One of six suggested improvements, was not adopted – HV suggested if a UCH find is recorded and not avoidable that a Maritime Archaeological Management Plan may be required – This was rejected as Emperor believes this is covered under the existing CM45 and EPS45.1,	• Feedback provided to HV on 11/05/2026 [#416] explaining where Emperor has adopted five of six HV suggested improvements and incorporated into to Control Measures and Environmental Performance Standards.	• Updated wording incorporated into EPS37.1, EPS37.2 and CM37.

	to either avoid the UCH find, or seek a permit as per the UCH Act.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in December 2024; no additional time has been requested.

2.2.15. Major Projects Foundation Victoria

Summary of consultation effort and relevant person responses
• [MP-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [MP-02] Emperor Energy sent a follow up email on 4/05/2023. • [MP-03] MP replied to the email on 4/05/2023, stating that no further information is required. • [MP-04] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#36] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#276] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• MP confirmed no further information is required. • No objections or claims made.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Relevant persons advised no further information was required. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

2.2.16. Parks Victoria

Summary of consultation effort and relevant person responses
• [VIC-PV-01] Emperor Energy emailed on 28/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-PV-02] Parks Victoria replied to the email on 29/05/2023, with a contact for the person to consult. • [VIC-PV-03] Emperor Energy replied to the email on 29/05/2023, asking if Parks Victoria would like to have a meeting. • [VIC-PV-04] Parks Victoria replied on 23/06/2023, advising that a meeting is not required, but requested to be kept informed. o Measures adopted: Will keep advised. • [VIC-PV-05] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#38] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#316] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Parks Victoria provided contact details for relevant person and advised despite a meeting not being required that they should continue to be consulted. • No objections or claims made.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy have continued to consult with Parks Victoria.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities. Emperor Energy will continue to consult with Parks Victoria.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

2.2.17. Ports Victoria

Summary of consultation effort and relevant person responses			
• [#108] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#321] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

2.2.18. Safe Transport Victoria

Summary of consultation effort and relevant person responses

- [#111] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#325] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

2.2.19. Southern Rural Water

Summary of consultation effort and relevant person responses

- [#128] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website
- [#334] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised.	N/A	• Emperor Energy considers the measures and controls in the EP

	• Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.		addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

2.2.20. Transport for NSW

Summary of consultation effort and relevant person responses
• [NSW-DOT-01] Emperor Energy emailed on 2/01/2025, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-DOT-02] Transport for NSW replied on 2/01/2025, auto-reply. • [NSW-DOT-03] Transport for NSW emailed on 3/01/2025, providing comments on the OPEP to update information for the NSW spill response. • [NSW-DOT-04] Transport for NSW emailed on 3/01/2025, providing the link to the updated NSW Coastal Water Marine Pollution Plan for OPEP. • [NSW-DOT-05] Emperor Energy emailed on 10/1/2025, acknowledging advice.   o Measures adopted: updates incorporated in OPEP. • [NSW-DOT-06] Emperor Energy emailed on 24/02/2025, with updated OPEP Rev B. • [NSW-DOT-07] Transport for NSW replied on 24/02/2025, auto reply. • [#65] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#355] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party. • [#357] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Transport for NSW provided updated information for NSW spill response for consideration in OPEP. • Transport for NSW provided the link to the updated NSW Coastal Water Marine Pollution Plan for consideration in OPEP.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy confirms that the OPEP was updated in accordance with updated information provided by Transport for NSW.	• Updated information on NSW spill response, including the NSW Coastal Water Marine Pollution Plan, has been incorporated into OPEP.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided along with draft OPEP. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in March 2023; no additional time has been requested.			

2.2.21. Victorian Fisheries Authority

Summary of consultation effort and relevant person responses
• [VIC-VFA-01] Emperor Energy made a phone call on 13/09/2022, following up on a website enquiry that requested fishing effort and vessel activity for Victorian fisheries between 2011-2021. • [VIC-VFA-02] Vic Fisheries Authority emailed on 13/09/2022, with clarification on fisheries data • [VIC-VFA-03] Emperor Energy replied to the email on 13/09/2022, with outline of fisheries data request. • [VIC-VFA-04] Vic Fisheries Authority replied to the email on 13/09/2022, with the outline of data request to the Catch and Effort unit within VFA. • [VIC-VFA-05] Emperor Energy replied to the email on 13/09/2022, with clarification of fisheries data. • [VIC-VFA-06] Vic Fisheries Authority emailed on 27/10/2022, package of data received including catch effort data and fisheries management area maps. • [VIC-VFA-07] Emperor Energy emailed on 13/12/2022, with clarification on fisheries data. • [VIC-VFA-08] Vic Fisheries Authority emailed on 15/12/2022, with clarification on fishers data. • [VIC-VFA-09] Emperor Energy replied to the email on 15/12/2022, with clarification on sea urchin data. • [VIC-VFA-10] Vic Fisheries Authority emailed on 20/12/2022, providing data of sea urchin fisheries.

- [VIC-VFA-11] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#63] Emperor emailed staff members on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#367] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Vic Fisheries Authority provided fishing data with the outline of data request to the Catch and Effort unit within VFA upon request from Emperor Energy and package of data received including catch effort data and fisheries management area maps. • No objections or claims	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy clarified data from VFA within the EMBA and requested outline of data provided	• Emperor Energy inputted the relevant fisheries data supplied into the EP for Victorian Fisheries within the EMBA • Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Sept 2022; no additional time has been requested.

2.2.22. Victorian State Parliament

Summary of consultation effort and relevant person responses

- [#154] Emperor Energy emailed Minister for Minister for Climate Action, Energy, Resources on 14/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included a formal letter outlining the project and plans into the following year to appraisal the Judith Field, in addition to an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

- [#155] Emperor Energy emailed Member for Gippsland South on 14/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included a formal letter outlining the project and plans into the following year to appraisal the Judith Field, in addition to an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#156] Emperor Energy emailed Member for Gippsland East on 14/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included a formal letter outlining the project and plans into the following year to appraisal the Judith Field, in addition to an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#202] Member for Gippsland South emailed 14/10/2025, advising it is unlikely to have any local impacts to their electorate. Advised to contact member for Gippsland East who might have constituents affected [Noting this Minister was emailed in #156]
- [#203] Member for Gippsland East emailed 24/10/2025, to confirm a meeting date of the 7th of November
- [#211] Emperor Energy presented to Senior Advisor for Minister for Resources on 22/10/2025, with overview presentation of the project, including the exploration and appraisal activities to the (Victorian) Minister for Resources office. The Minister was thankful for the project overview, asked to be kept informed on progress and to ensure we activity engage with our identified affected stakeholders.
- [#212] Emperor Energy presented to Member for Gippsland East on 07/11/2025, provided an overview presentation of the project, including technical objectives and stakeholder impacts. Hon Member for East Gippsland asked to be kept informed on progress. Emphasised the importance of keeping key stakeholders informed, specifically the fishing fleets in the region and also keeping local Council aware of the project and the operations.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Minister for Regional Development and Liveability advised that the activity was unlikely to have any local impacts to their electorate. • Advised to contact member for Gippsland East who might have constituents affected • [#211] During a presentation from Emperor Energy, the Minster for Resources was thankful for the project overview, asked to be kept informed on progress and to ensure we activity	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• During a meeting with the Minister for Resources [#211], Emperor provided an overview presentation of the project, including technical objectives and stakeholder impacts. • Emperor Energy acknowledged the views of Victorian State members during meetings [#212]. Have engaged with Lakes Entrance fishing fleet as requested	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

engage with our identified affected stakeholders. • [#212] Hon. Member for East Gippsland wanted to ensure we kept the Lakes Entrance fishing fleet fully informed of our project and its impacts. • No objections or claims			

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

2.2.23. West Gippsland Catchment Management Authority

Summary of consultation effort and relevant person responses			
• [#377] Emperor Energy emailed 21/11/2025, with email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in November 2025; no additional time has been requested.

3. 25(1)(d) - Person, Org. that may be affected

3.1. Environment and Conservation Groups

3.1.1. Australian Coastal Society

Summary of consultation effort and relevant person responses			
• [AUCS-01] Emailed on 1/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [AUCS-02] Emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#7] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#219] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.			

3.1.2. Australian Conservation Foundation

Summary of consultation effort and relevant person responses			
• [ACF-01] Emailed on 1/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [ACF-02] Emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#5] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#218] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.			

3.1.3. Australian Marine Conservation Society

Summary of consultation effort and relevant person responses

- [AMCS-01] Emperor Energy emailed on 1/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [AMCS-01] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#4] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#222] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

3.1.4. Friends of the Earth Melbourne

Summary of consultation effort and relevant person responses

- [VIC-FOE-01] Emperor Energy emailed on 1/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [VIC-FOE-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

- [VIC-FOE-03] FOE emailed on 13/12/2024, auto reply out of office.
- [#132] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#261] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

3.1.5. Greenpeace Australia

Summary of consultation effort and relevant person responses

- [GPA-01] Emperor Energy emailed on 1/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [GPA-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#130] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

• [#267] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.			

3.1.6. Sea Shepherd Australia

Summary of consultation effort and relevant person responses			
• [SSA-01] Emperor Energy emailed on 1/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [SSA-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#127] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#328] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**

• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

3.1.7. Surfers for Climate

Summary of consultation effort and relevant person responses
• [SFC-01] Emperor Energy emailed on 1/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [SFC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#180] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#338] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

3.1.8. The Wilderness Society

Summary of consultation effort and relevant person responses
• [WS-01] Emperor Energy emailed on 1/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [WS-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#58] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#353] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party. • [#394] The Wilderness Society emailed 27/11/2025, confirmed they are a relevant person under the OPGGS Act, but does not have any feedback to provide at this time. Requested to be kept informed on the progress of the project, and when activities commence and addition of two new contact points. • [#392] Emperor Energy emailed 28/11/2025, Email to confirm the addition of two new contact points and that we shall keep informed.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Wilderness Society confirmed they are a relevant person under the OPGGS Act, however stated they have no feedback to provide at this time	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

• Would like to be kept informed on the approval process progress and when activities commence • No claims or objections raised	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

3.1.9. Whale and Dolphin Conservation

Summary of consultation effort and relevant person responses
• [WDCA-01] Emperor Energy emailed on 1/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [WDCA-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#76] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#373] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

3.1.10. Wildlife Victoria

Summary of consultation effort and relevant person responses			
• [#125] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#375] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.1.11. World Wildlife Fund Australia (WWF)-Australia

Summary of consultation effort and relevant person responses

- [WWFA-01 Emperor Energy emailed on 1/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [WWFA-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website
- [WWFA-03] WWF emailed on 13/12/2024, auto email acknowledging email has been received.
- [#80] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#198] WWF emailed on 14/10/2025, auto email acknowledging email has been received.
- [#376] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

3.2. Fisheries - Body or Agency

3.2.1. Abalone Council Australia Ltd

Summary of consultation effort and relevant person responses

- [ACA-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [AC-02] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#213] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.2.2. Abalone Victoria Central Zone

Summary of consultation effort and relevant person responses

- [VIC-AVCZ-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [VIC-AVCZ-02] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.2.3. Australian Southern Bluefin Tuna Industry Association

Summary of consultation effort and relevant person responses
• [ASBTIA-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [ASBTIA -02] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [ASBTIA-03] ASBTIA emailed on 13/12/2024, acknowledging that ASBTIA remains a relevant person. Advised no operational concerns or immediate impacts to relevant fisheries envisaged. • [ASBTIA-04] Emperor Energy replied to the email on 13/12/2024, acknowledging the response from ASBTIA and invited further feedback. • [ASBTIA-05] ASBTIA replied to the email on 13/12/2024, acknowledging response from Emperor Energy. • [#13] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

- [#189] Emperor Energy emailed on 21/10/2025, following direction from AFMA to follow up with engagement. Emperor emailed advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#190] Emperor Energy emailed on 29/10/2025, to request meeting with ASBTIA when they are available to discuss any concerns.
- [#209] ASBTIA emailed on 21/10/2025, stating they remain a relevant person for the activity. Stated that ASBTIA represents more than 90% of Australian holders of Southern Bluefin Tuna Statutory Fishing Rights, that their partner Tuna Australia is the peak representative body for surface long line fishing in the Judith-2 EMBA. No objections or claims raised.
- [#225] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.
- [#336] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• ASBTIA acknowledged that they remain a relevant person for engagement. • ASBTIA advised that they had no concerns around the activity. • No objections or claims.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy continue to engage with ASBTIA as a relevant person.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.2.4. Australian WildCatch Fishing

Summary of consultation effort and relevant person responses

- [#82] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#131] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#230] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.2.5. Commonwealth Fisheries Association

Summary of consultation effort and relevant person responses
• [CFA-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [CFA-02] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#9] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

• [#235] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.2.6. Corner Inlet Fisheries Habitat Association

Summary of consultation effort and relevant person responses			
• [#378] Emperor Energy emailed 21/11/2025, with email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party. • [#407] Emperor Energy submitted follow-up notification 03/03/2026, via Corner Inlet Fisheries HA website, if they have any further comment of feedback on the proposed Judith-2 plans and potential impacts.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in November 2025; no additional time has been requested.

3.2.7. Eastern Victorian Sea Urchin Divers Association

Summary of consultation effort and relevant person responses
• [VIC-EVSUDA-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-EVSUDA-02] EVSUDA replied with one email bounced back, other transmitted ok. • [VIC-EVSUDA-03] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-EVSUDA-04] Emperor Energy received an email on 27/11/2025 with a returned email notifying that the email was not delivered. • [#23] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#196] Emperor Energy received an email on 14/10/2025 with a returned email notifying that the email was not delivered.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested. Later emails not delivered despite initial emails being delivered successfully. Licence holders also covered by SIV and Eastern zone abalones industry association.

3.2.8. Eastern Zone Abalone Industry Association

Summary of consultation effort and relevant person responses
• [VIC-EZAIA-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-EZAIA-02] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#25] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#260] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.2.9. Game Fishing Association of Victoria

Summary of consultation effort and relevant person responses			
• [#93] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#262] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.2.10. Gippsland Lakes Fishing Club

Summary of consultation effort and relevant person responses
• [#96] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website

• [#264] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.2.11. Recreational Fishing Alliance of NSW

Summary of consultation effort and relevant person responses
• [NSA-RFANSW-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSA-RFANSW-02] Emperor Energy emailed on 4/05/2023, following up on the previous email sent. • [NSA-RFANSW-03] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#49] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#323] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.2.12. San Remo Fishermen's Co-operative

Summary of consultation effort and relevant person responses			
• [VIC-SRFC-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-SRFC-02] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#44] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.			
Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.2.13. Seafood Industry Tasmania

Summary of consultation effort and relevant person responses
• [TAS-TSIC-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAS-TSIC -02] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#43] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#110] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#129] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#329] Emperor Energy emailed stakeholder 212 on 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party. • [#330] Emperor Energy emailed stakeholder 214 and 213 on 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted

• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.2.14. Seafood Industry Victoria

Summary of consultation effort and relevant person responses
• [VIC-SIV-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-SIV-02] SIV emailed on 19/04/2023, auto response: out of office. • [VIC-SIV-03] SIV emailed on 19/04/2023, requesting for video conference meeting to discuss further in May. • [VIC-SIV-04] Emperor Energy emailed on 12/05/2023, acknowledging request for a meeting, and proposed a date. • [VIC-SIV-05] SIV emailed on 15/05/2023, responding to propose meeting the week of June 19th. • [VIC-SIV-06] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-SIV-07] SIV replied to the email on 13/12/2024, providing a standard services agreement. • [VIC-SIV-08] Emperor Energy replied to the email on 13/12/2024, requesting a call to discuss execution of services agreement. • [VIC-SIV-09] SIV emailed on 14/01/2025, providing a standard services agreement. • [VIC-SIV-10] Emperor Energy emailed on 15/01/2025, providing a draft advertisement for SIV newsletter and Consultation Information Sheet (Version 2, November 2024) with updated timing.

- [VIC-SIV-11] SIV emailed on 16/01/2025, providing a draft newsletter and requested more information on seismic activity. SIV confirmed information would be included in members newsletter dated 17 Jan 2025.
- [VIC-SIV-12] Emperor Energy replied to the email on 16/01/2025, approving the newsletter and provided information on seismic survey area.
- [VIC-SIV-13] Emperor Energy emailed on 17/01/2025, providing additional information on seismic survey. Size ~ 2km x 2kms, up to 4 days duration. The purpose is to identify any drilling hazards.
- [#50] Emperor emailed staff members on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#52] Emperor emailed staff members on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#331] Emperor Energy emailed stakeholder 218 and 217 on 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.
- [#396] SIV emailed 24/11/2025, requesting is Emperor would like SIV to send out the update from correspondence [#331] in the next e-news update to members in accordance with the terms of the Engagement Agreement
- [#399] Emperor Energy emailed on 24/11/2025, Email to SIV, to setup call to discuss outgoing communications to their members.
- [#402] SIV emailed on 25/11/2025, proposing a meeting time
- [#400] Call with SIV to confirm content of next newsletter to be sent out by SIV, including Emperor Energy content. Confidential discussion on terms of agreement.
- [#406] Following follow-up call between Emperor Energy and SIV on topic of any feedback received from SIV's member-base, SIV provided a confidential letter (for Emperor Energy and NOPSEMA), confirming that no feedback, or follow-up requests had been received from SIV members.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• On Emperor Energy's request, details of the activity were included in SIV's newsletter. No further information requested. • No objections or claims.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy engaged with SIV to include information on the activity within SIV's newsletter.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. Information sent to members 17 January 2025. No further information has been requested, and no matters raised remain outstanding. Details of the activity were included in SIV's newsletter.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.2.15. South East Trawl Fishing Industry Association

Summary of consultation effort and relevant person responses

- [SETFIA-01] Emperor Energy made a phone call on 21/12/2022, enquiring for the best way to engage with SETFIA. Emperor explained the drilling of one exploration well and 2D shallow seismic to identify shallow gas.
  - SETFIA said to send an email in the new year with information about the well and 2S, and SETFIA will take a look. There are charges for SMS messaging. Also need to contact VFA.
  - Measures adopted: advice agreed and followed.
- [SETFIA-02] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [SETFIA-03] SETFIA emailed on 19/04/2023, acknowledging impact and requesting a meeting via Zoom. Attachments including policy document for seismic survey and flyer illustrating how they assist the oil and gas industry.
- [SETFIA-04] Emperor Energy emailed on 12/05/2023, with proposed date for online meeting.
  - SETFIA - Proposal of date of meeting.
- [SETFIA-05] Emperor Energy emailed on 15/05/2023, confirming that the proposed date and time for meeting is suitable.
  - SETFIA - Acceptance of proposed meeting date and time.
- [SETFIA-06] Emperor Energy emailed on 22/05/2023, with background information (attached) to read.
- [SETFIA-07] SETFIA emailed on 20/06/2023, requesting for meeting via Teams.
- [SETFIA-08] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
  The email also requested setting up a support agreement for consultation with members of the following fisheries:
  - South East Trawl Fishery (Cth).
  - Gillnet Hook and Trap Fishery (Cth).
  - Eastern Zone Rock Lobster Fishery (Vic).
  - Central Zone Scallop Fishery (Cth).
  - Small Pelagic Fishery (Cth).

- [SETFIA-09] SETFIA emailed on 17/12/2024, with a commercial discussion – sensitive information.
- [SETFIA-10] Emperor Energy emailed on 13/01/2025, providing clarification on the services agreements with relevant fisheries that interact with the EMBA.
- [SETFIA-11]] SETFIA emailed on 14/01/2025, providing advice on engaging with relevant fisheries and a draft example of data reporting SETFIA can complete. Also had queries regarding impacts of surveys on fisheries -size of survey and impacts to fishing gear.
- [SETFIA-12] Emperor Energy emailed on 23/01/2025, providing feedback to queries with Judith-2 activities, particularly seismic survey impacts on fisheries.
- [SETFIA-13] Emperor Energy met with SETFIA on 24/01/2025, providing high level overview of proposed activities in line with information sheet.
  - SETFIA agreed to support consultation with members.
  - Emperor Energy sent a follow up email from the discussion, and provided information for engagement with fisheries.
- [SETFIA-14] SETFIA emailed on 24/01/2025, providing a draft notification to SETFIA members on Judith-2 activity.
- [SETFIA-15] SETFIA emailed on 24/01/2025, confirming responses from the email from Emperor Energy sent to SETFIA on 23/01/2025, acknowledging that seismic will have minimal impacts.
- [SETFIA-16] Emperor Energy emailed on 25/01/2025, acknowledging the response from SETFIA and confirmed consultation with SETFIA members to proceed.
- [SETFIA-17] SETFIA emailed on 29/01/2025, confirming text to be sent to SETFIA members.
- [SETFIA-18] Emperor Energy replied to the email on 29/01/2025, acknowledging email from SETFIA.
- [#53] Emperor Energy emailed Staff member on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#62] Emperor Energy emailed Relevant Person 2 on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#199] Emperor Energy received email on 14/10/2025 requesting for contact to be made via the phone. Call attempt made, no response.
- [#332] Emperor Energy emailed stakeholders on 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.
- [#333] Emperor Energy emailed stakeholders on 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.
- [#417] Emperor Energy phoned SETFIA (unanswered) 06/07/2026, to check if any members provided feedback previously.
- [#418] Emperor Energy emailed SETFIA 25/08/2026, follow-up to check if any members provided further feedback.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted

• SETFIA advised that VFA should be engaged. • SETFIA provided policy document for seismic surveys and information on how SETFIA can assist the oil and gas industry. • SETFIA provided advice on engagement with relevant fisheries and requested further information on potential impacts to fisheries. • SETFIA agreed to support consultation with members on the activity. • No objections or claims.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy have consulted VFA, as advised by SETFIA (Appendix D - Section 2.2.21). • Seismic policy and information on assistance of SETFIA to oil and gas industry acknowledged. • SETFIA advice on engagement with relevant fisheries taken on board for future engagement. • Further details on potential impacts to fisheries from the activity via email with follow-up meeting held to discuss further.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. Information sent to members 17 January 2025. No further information has been requested, and no matters raised remain outstanding. Information sent to members 29 January 2025; no additional information has been requested by members. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested. Information sent to members 29 January 2025.

3.2.16. Tasmanian Association for Recreational Fishing

Summary of consultation effort and relevant person responses
• [TAS-TARF-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAS-TARF-02] Emperor Energy made a phone call on 1/05/2023, to the number listed on the website and left a voicemail requesting a call back on mobile phone number, regarding Emperor Energy's proposed offshore project.

- [TAS-TARF-03] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#55] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#354] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.2.17. Tuna Australia

Summary of consultation effort and relevant person responses
• [TA-01] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. The email chain sent to CFA [CFA-02] was copied in for reference and Emperor also requested setting up a support agreement for consultation. • [TA-02] TA replied to the email on 13/12/2024, providing a draft agreement that would cover licence holders in Eastern Tuna and Billfish and Eastern Skipjack fisheries, and some Southern Bluefin Tuna (SBT) longliners. SBT purse-sein fishers are covered by ASBTIA. • [TA-03] Emperor Energy emailed on 16/01/2025, providing a fee-for-service agreement.

- [TA-04] Emperor Energy emailed on 24/01/2025, providing Consultation Information Sheet (Version 2, November 2024) and a summery for TA to supply to members.
- [TA-05] TA replied to the email on 24/01/2025, confirming timing for consultation with members.
- [TA-06] Emperor Energy replied to the email on 25/01/2025, acknowledging TA confirmation to consult with TA members.
- [TA-07] TA emailed on 28/02/2025, providing a report with an overview of the Judith-2 interaction with TA's members' interests and provided statistics that described commercial fishing activities within represented fisheries by members. Reported a high level of reach to members during TA consultation with its members. The report confirmed Tuna Australia engaged all concession holders in the ETBF and permit holders in the Australian skipjack fishery (east). Our consultation package was sent to:
  - 116 entities who hold 430 concessions in the ETBF
  - 19 permit holders in the Eastern sector Australian Skipjack fishery

  From our database statistics, we can inform Emperor Energy that the consultation reached:
  - 116 recipients (100% delivery rate) covering concession holder details described above received the consultation package.
  - 48 recipients (41%) viewed the consultation package

  The report concluded that Judith-2 poses low risk to tuna fishing industry. Emphasised the importance of migratory pathways for SBT and Eastern Tuna and Billfish Fishery (ETBF) in the Bass Strait. Some concession holders raised concerns regarding potential access from exclusion zones, cumulative impacts, hydrocarbon leaks from abandoned well, and if we had consulted with surrounding fisheries.
- [TA-08] Emperor Energy emailed on 12/03/2025, noting that the activity poses a low risk to tuna fisheries. Addressed responses to concerns regarding short-term exclusion area around MODU and short-term nature or survey activities. Also noted that we had consulted widely with fisheries in the area and addressed cumulative impacts in the EP. Addressed that risks associated with hydrocarbons leaking from P&A wells is low as Judith-2 will be following industry standards and WOMP.
  - No new measures adopted.
- [#68] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#159] TA emailed on 17/10/2025 confirming that no major changes (location or timeframe exceeding +6 months) is occurring in this update of the EP. Advised that TA have already consulted with the tuna fishing community of the Judith well exploration and drilling activities in February. Advised if there are no substantial changes to the EP, then it is not necessary to consult a second time. No objections raised.
- [#160] Emperor Energy emailed on 17/10/2025, stated there are no major changes to the planned operations or wider Operational Area. Advised that minor changes include timeline for operations updated to 2026 and possibly 2027 for drilling operations, the location of the Judith-2 well has moved approximately 500 m but remains within the Operational Area, and that sidetrack option and oil-based drilling fluids have been removed. Advised they will update TA with newsletters every 1 – 2 months as they progress. Provided an opportunity to meet.
- [#185] TA emailed on 21/10/2025, thanking for the summary of changes, and advised they have sent out a short email update to the tuna fishing community with the minor changes to keep them informed. Provided a copy of the email sent out to members. No objections raised.

- [#186] Emperor Energy emailed on 21/10/2025, acknowledging response from TA and welcomed any further feedback.
- [#359] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• TA agreed to support consultation with members on the activity. • TA provided an overview of the potential interaction of the activity with TA's members' interests and provided data on commercial fishing activities represented by members. • TA advised that the activity poses a low risk to tuna fishing industry. • TA emphasised importance of migratory pathways for SBT and ETBF. • Some concession holders raised concerns regarding potential restricted access from exclusion zones, cumulative impacts, hydrocarbon leaks from abandoned well, and queried if consultation with surrounding fisheries had been conducted. • No objections raised by TA or members.	• No objections raised. • Emperor Energy acknowledge TA's concerns regarding impacts to fisheries. The EP will assess the potential for the activity to restrict access for fisheries and potential cumulative impacts, noting any exclusion from the MODU or survey activities will be short-term. • The risk of hydrocarbon leaks from P&A wells is low. Standard industry standards will be followed and a WOMP will be implemented.	• Emperor engaged with TA for consultation with members. • TA's information on the potential interaction between the activity and TA's members' interests is acknowledged and has informed the assessments within the EP. • EP will assess impacts relating to regarding exclusion and cumulative impacts. • Emperor Energy will follow standard industry standards and implement a WOMP to reduce the risk of hydrocarbon leaks from P&A wells. No additional measures adopted.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. Further information provided to address concerns raised. No outstanding requests for further information.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in December 2024; no additional time has been requested.

3.2.18. Victorian Scallop Fishermen's Association

Summary of consultation effort and relevant person responses			
• [VIC-SFA-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC- SFA -02] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#72] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#368] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.2.19. VRFish

Summary of consultation effort and relevant person responses			
• [#74] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#371] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.3.Fisheries - Commercial

3.3.1. Lakes Entrance Fishermen's Co-operative Limited

Summary of consultation effort and relevant person responses
• [VIC-LEFCO-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

- [VIC-LEFCO-02] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#83] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#274] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.3.2. Mitchelson Fisheries

Summary of consultation effort and relevant person responses
• [#281] Emperor Energy emailed 21/11/2025, with email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party. • [#404] Emperor Energy emailed 03/03/2026, follow-up email to Mitchelson Fisheries, if they have any further comment of feedback on the proposed Judith-2 plans and potential impacts.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in November 2025; no additional time has been requested, and relevant person noted that well outside zone of interest.

3.3.3. Scallop Fishermen's Association of Tasmania

Summary of consultation effort and relevant person responses
• [TAS-SFAT-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAS-SFAT-02] SFAT replied to email on 17/04/2023 advising the well location is outside of the interest for Bass Strait Central Zone Scallop fishermen.   o Well location is outside of the area of interest for Bass Strait Central Zone Scallop fishermen. • [TAS-SFAT-03] Emperor Energy replied on 17/04/2023, acknowledging response.   o No update provided as previously advised location well outside their area of interest. • [#47] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#327] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted

• SFAT advised that the well location is outside of the interest for Bass Strait Central Zone Scallop fishermen. • No objections or claims.	• No claims or objections were raised. • Relevant person has been provided sufficient information, and has advised that well location is outside of the area of interest for Bass Strait Central Zone fishermen. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy acknowledged that the well location is located outside of their area of interest in the Bass Strait	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested, and relevant person noted that well outside zone of interest.

3.3.4. Southern Rock Lobster Ltd

Summary of consultation effort and relevant person responses
• [SRLL-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [SRLL-02] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#60] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#335] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. \ • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.3.5. Southern Shark Industry Alliance

Summary of consultation effort and relevant person responses			
• [#379] Emperor Energy emailed 21/11/2025, with email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party. • [#405] Emperor Energy sent follow-up request via the SSIA website, if they have any further comment of feedback on the proposed Judith-2 plans and potential impacts.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. \ • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in November 2025; no additional time has been requested.

3.3.6. Trinsand Fisheries

Summary of consultation effort and relevant person responses			
• [TF-01] Emperor Energy emailed on 27/01/2025, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. The email chain sent to CFA (CFA-02) was copied in for reference and Emperor also requested setting up a support agreement for consultation. • [#69] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#358] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in January 2025; no additional time has been requested.			

3.4.Fisheries - Recreational

3.4.1. Marlo Angling Club

Summary of consultation effort and relevant person responses
• [VIC-MAC-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-MAC-02] Emperor Energy made a phone call on 3/05/2025, spoke with a staff member from MAC.   o MAC staff member advised the email was received and is on the agenda for discussion at the monthly committee meeting. • [VIC-MAC-03] Emperor Energy emailed on 29/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#40] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#279] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• MAC informed Emperor Energy that consultation information was received and on the agenda for discussion at monthly committee meeting. • No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. MAC informed Emperor Energy that consultation information was received and on the agenda for discussion at monthly committee meeting. No feedback provided. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.4.2. Victoria Game Fishing Club

Summary of consultation effort and relevant person responses
• [VIC-VGFC-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-VGFC-02] Emperor Energy made a phone call on 28/04/2023, and left a voice mail advising to contact Emperor regarding Emperor Energy's proposed offshore project • [VIC-VGFC-03] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#70] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#364] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party. • [#384] Victoria Game Fishing Club emailed on 24/11/2025, requested to be unsubscribed from future mailing list.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Victoria Game Fishing Club requested to be unsubscribed from future emails. • No claims or objections raised.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.5.Infrastructure Operator

3.5.1. Port Anthony Renewables

Summary of consultation effort and relevant person responses			
• [PA-01] Emailed on 28/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [PA-02] Emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#45] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#318] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.			

3.5.2. Port of Hastings Corporation

Summary of consultation effort and relevant person responses			
• [#122] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#320] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.5.3. Qube Ports

Summary of consultation effort and relevant person responses
• [QP-01] Emperor Energy emailed on 28/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [QP-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

- [#46] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#322] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

3.6.Local Resident or Group

3.6.1. Golden Paradise Beach Ratepayers & Residents Association

Summary of consultation effort and relevant person responses
• [#177] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#266] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted

• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.6.2. Individual Persons – IP-1

Summary of consultation effort and relevant person responses
• [IP-1-01] Email received from IP-1 on 19/12/2024, requesting information – presumably in response to advertisement consultation. Raised concerns about spills and decommissioning, requesting further information on measures to prevent spills and for the removal of infrastructure and equipment. • [IP-1-02] Emperor Energy emailed on 30/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024), The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. The email also pointed to where concerns raised were addressed. No measures adopted as concerns raised are already being addressed. • [#32] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#270] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• IP-1 raised concerns on potential risk of spills and impacts from decommissioning.	• Emperor Energy acknowledge IP-1concerns regarding potential spill risk and impacts from decommissioning.	• Emperor Energy have continued to engage with IP-1 to provide updated information on the activity.	• Emperor Energy considers the measures and controls in the EP

• No objections raised.	• The risk of spills will be addressed within the EP and control measures will be established to reduce the risk to ALARP. • The EP covers P&A activities. The EP provides an assessment against OPGGS Act, section 572 for removal of property.	• EP will assess concerns raised. Control measures will be adopted to reduce spill risk and Emperor Energy confirm that they will meet the requirements of Section 572 of the OPGGS Act for the removal of property.	addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 has been provided. Additional information has been provided and there are no outstanding requests for further information. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2024; no additional time has been requested.			

3.6.3. Individual Persons – IP-2

Summary of consultation effort and relevant person responses			
• [IP-2-01] Email received from IP-2 on 14/04/2023, requesting general information in response to advertisement for consultation on how the activity could impact SE Australia. • [IP-2-02] Emperor Energy emailed on 19/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [IP-2-03] Emperor Energy emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#31] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#273] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**

• IP-2 emailed requesting general information on the activity. • No objections or claims raised.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy responded to IP-2 request for information by providing consultation information sheets.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 has been provided. Additional information has been provided and there are no outstanding requests for further information. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.7.Offshore Energy Operator

3.7.1. 3D Energi Limited

Summary of consultation effort and relevant person responses			
• [#214] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Nov 2025; no additional time has been requested.

3.7.2. Amplitude Energy (Previously Cooper Energy)

Summary of consultation effort and relevant person responses
• [CE-01] Cooper Energy emailed on 28/02/2023, Cooper Energy email to inform of 2023 activities, includes fact sheet. Cooper Energy request to be informed on Emperor Energy offshore activity. • [CE-02] Emperor Energy emailed on 12/05/2023, acknowledgement of email with no objections. Invitation to comment on proposed drilling activities of Judith-2. • [CE-03] Cooper Energy Emailed on 26/05/2023, response requesting to be kept informed, especially approaching commencement.   o Measures adopted: Request to be informed agreed and will be captured as per Section 7.10 Commitment and Notification Management. • [CE-04] Emperor Energy emailed on 28/05/2023, confirmed that Emperor Energy will continue to consult Cooper Energy on the activity. • [CE-05] Emperor Energy Emailed on 24/11/2024, provided a Consultation Information Sheet (Version 2, November 2024) to Amplitude (Cooper Energy). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#217] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party. • [#385] Amplitude emailed on 24/11/2025, emailed to state they have no matters to raise, but would like to continue to be informed as things progress.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Amplitude Energy (Cooper Energy) initially contacted Emperor Energy during their consultation period as they had identified Emperor Energy as a potential relevant person. • Amplitude Energy (Cooper Energy) advised they would like to be kept informed of activities when the project commences.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy responded to initial contact with Amplitude Energy by providing Amplitude Energy with the stakeholder fact sheet and invited an opportunity to comment on the activity. • Emperor Energy has agreed to notify Amplitude Energy when the activity commences.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

• No objections or claims raised.			

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested

3.7.3. Blue Mackerel North Pty Ltd

Summary of consultation effort and relevant person responses
• [#174] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#229] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.7.4. CarbonNet Project

Summary of consultation effort and relevant person responses			
• [#126] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#232] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.7.5. Carnarvon Hibiscus Pty Ltd

Summary of consultation effort and relevant person responses
• [CH-01] Emperor Energy Emailed on 29/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [CH-02] Emperor Energy emailed on 29/05/2023, re-sent to generic email as previous email bounced. • [CH-03] Carnarvon Hibiscus Pty Ltd emailed on 30/05/2023, response stating organisation does not wish to be consulted further.

- [#162] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email stated that although the stakeholder is not in proximity of the activity, that the stakeholder lies within the EMBA and invited feedback since the last contact was in 2023. The email also included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#234] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Carnarvon Hibiscus Party does not wish to be consulted further. • No objections or claims raised.	• No objections or claims raised. • Relevant person has been provided sufficient information, and has advised there is no need to meet or to be kept informed.	• Emperor Energy contacted the stakeholder again in 2025 to invite feedback as the stakeholder lies within the EMBA.	Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested and noted they do not need to be consulted further on this activity.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

3.7.6. Corio Generation

Summary of consultation effort and relevant person responses

- [#171] Emperor energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle	N/A	• Emperor Energy considers the measures and controls in the EP

	of an EP. Should feedback be received, Emperor Energy will apply the MoC process.		addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.7.7. Esso Australia

Summary of consultation effort and relevant person responses			
• [ESSO-01] Emperor Energy emailed on 12/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [ESSO-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested and noted they do not need to be consulted further on this activity. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

3.7.8. Flotation Energy

Summary of consultation effort and relevant person responses			
• [FE-01] Emperor Energy emailed on 29/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [FE-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [FE-03] Flotation Energy emailed on 16/12/2024, advising that the Judith-2 activity is unlikely to interfere with Flotation activity. Raised a matter of confidential commercial nature which is included in the sensitive information report. • [FE-04] Emperor Energy emailed on 08/01/2025, acknowledging Flotation Energy response, • [FE-05] Flotation Energy emailed on 08/01/2025, auto-response email			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• Flotation Energy advised the Judith-2 activity is unlikely to interfere with Flotation activities. • No objections or claims were raised.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy acknowledged response from Flotation Energy that Judith-2 activities were unlikely to interfere with Flotation Energy activities	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in March 2023; no additional time has been requested.			

3.7.9. GB Energy Limited

Summary of consultation effort and relevant person responses

- [#175] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#176] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#263] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.7.10. Iberdrola Australia

Summary of consultation effort and relevant person responses

- [#170] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#269] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted

• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.7.11. Liberty Petroleum

Summary of consultation effort and relevant person responses
• [#152] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, a link to Emperor Energy's website, and invitation for discussing any operational synergies. • [#275] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Oct 2025; no additional time has been requested.

3.7.12. Navigator North Project

Summary of consultation effort and relevant person responses			
• [#168] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#282] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Oct 2025; no additional time has been requested.			

3.7.13. Ocean Winds

Summary of consultation effort and relevant person responses			
• [#169] Emperor emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#313] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Oct 2025; no additional time has been requested.			

3.7.14. Oceanex

Summary of consultation effort and relevant person responses
• [OE-01] Emperor Energy emailed on 29/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [OE-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.			

3.7.15. Star of the South Offshore Wind Farm

Summary of consultation effort and relevant person responses			
• [#393] Emperor Energy emailed on 2/12/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). Seeking a meeting to discuss the planned operations. • [#398] SOTS emailed on 3/12/2025, stating they have no concerns or comments to raise, but suggested to meet to discuss planned activities and provide overview of SOTS project • [#401]Emperor Energy emailed 03/12/2025, to propose a meeting for Wednesday 10th Dec.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• Stated they have no concerns or comments to raise, but suggested to meet to discuss planned activities and provide overview of SOTS project	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	• Provided opportunity to meet on 10th of December	Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Emperor Energy engaged with relevant person to identify contact details with no response provided. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in December 2025; no additional time has been requested.

3.8.Other Parties

3.8.1. Australian Volunteer Coast Guard

Summary of consultation effort and relevant person responses			
• [#163] Emperor Energy submitted online enquiry on 20/10/2025, seeking contact point to share information on the project.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Emperor Energy engaged with relevant person to identify contact details with no response provided. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.8.2. Port Phillip Sea Pilots

Summary of consultation effort and relevant person responses

- [#109] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website
- [#319] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.9. Recreational Club or Group

3.9.1. Boating Industry Association of Victoria

Summary of consultation effort and relevant person responses

- [VIC-BIAV-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [VIC-BIAV-02] Emperor Energy made a phone call on 3/05/2023, spoke with a staff member who advised the relevant staff member is on leave. The relevant staff member will review the email after returning from leave.
- [VIC-BIAV-03] BIAV replied to the email on 2/05/2023, stating the distance of the activity from shore is not likely to be of consequence to recreational boating, but would like to be kept informed.

- [VIC-BIAV-04] Emperor Energy emailed on 29/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#10] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#228] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• BIAV advised that activity is unlikely to impact recreational boating. • BIAV requested that they are kept informed of the activity. • No objections or claims raised.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy has continued to consult BIAV by providing consultation information sheets.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested

3.9.2. Gippsland Lakes Yacht Club

Summary of consultation effort and relevant person responses

- [#95] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website
- [#153] Gippsland Lakes Yacht Club emailed on 14/10/2025, stating they have read the supplied documentation and advised they are not a relevant stakeholder as the yacht club operates in the inland waters of Gippsland Lakes. No objections were raised
  - The stakeholder requested to be removed from further consultation.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• The stakeholder stated they do not deem themselves a relevant stakeholder and requested to be removed from consultation. • No objections or claims were raised.	• No claims or objections were raised. • Relevant person has been provided sufficient information, and has advised there is no need to meet or to be kept informed.	N/A	Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested and stakeholder advised there is no need to be kept informed. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.9.3. Lakes Entrance Surf Life Saving Club

Summary of consultation effort and relevant person responses
• [VIC-SLSCLE-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-SLSCLE-02] Emperor Energy made a phone call on 1/05/2023, and spoke with Lake Entrance Surf Life Saving Club. o SLSCLE staff member requested the email be forwarded onto his email with the club cc'd. At this time, the club does not intend to respond and do not wish to organise a meeting, however they request to be kept informed (via the clubs email address) on the progress of activity. • [VIC-SLSCLE-03] Emperor Energy emailed on 1/05/2023, forwarding the introduction email and attachments from 17/04/2023. • [VIC-SLSCLE-04] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#33] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#272] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• SLSCLE staff member advised that they do not wish to meet but requested that they are kept informed on the progress of that activity. • No objections or claims raised.	• No claims or objections were raised. • Relevant person has been provided sufficient information, and has advised there is no need to meet or to be kept informed.	• Emperor Energy has continued to consult SLSCLE by providing consultation information sheets.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.9.4. Life Saving Victoria

Summary of consultation effort and relevant person responses
• [#181] Emperor emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#204] Life Saving Victoria emailed on 21/10/2025 providing contact details for relevant person to discuss the activity. • [#205] Life Saving Victoria emailed on 21/10/2025 providing contact details for relevant person to discuss the activity. • [#277] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Life Saving Victoria provided contact details for the relevant person to discuss the activity • No claims or objections raised	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.		

No response was received from the relevant person
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.9.5. Ocean Racing Club of Victoria

Summary of consultation effort and relevant person responses
• [VIC-ORCV-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-ORCV-02] ORCV replied to the email on 17/04/2023, requesting updates and the well location due to a yacht race in Feb-April 2025 in the region and ORCV are planning to advise members of the PSZ exclusion area for the race. • [VIC-ORCV-03] Emperor Energy replied to the email on 17/04/2023, confirming that requested updates would be provided. • [VIC-ORCV-04] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#41] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#314] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• ORCV requested to be kept informed on the activity and location to understand overlap with Feb-April 2025 yacht race and to enable	• No objections or claims raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	• Emperor Energy will inform ORCV on any updates of the activity. • Revised timing of the activity means no impact on planned race between	• Requested to be informed due to a race occurring in Feb – April 2025. As this timeline has passed and no further correspondence received, it is

communication of PSV exclusion area to members. • No objections or claims.	received, Emperor Energy will apply the MoC process.	February and April 2025 expected. No measures adopted.	expected that ORCV will not be impacted at this time by the Judith-2 Activity. • Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Revised timing means no impact on planned race Feb-Apr 2025. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.9.6. Royal Yacht Club of Victoria

Summary of consultation effort and relevant person responses			
• [VIC-RYCV-01] Emperor Energy emailed on 24/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [VIC-RYCV-02] Emperor Energy made a phone call on 3/05/2023, spoke with a staff member from RYCV. o RYCV staff member advised the email was received and the relevant staff member will review and respond. Message of the follow up call will be passed on. • [VIC-RYCV-03] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#51] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#324] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**

• RYCV informed Emperor Energy that consultation information was received and relevant staff member would review and respond (if required). • No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. RYCV staff member advised that relevant staff member would review and respond to Emperor Energy's email. No feedback provided. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.9.7. Scuba Divers Federation of Victoria

Summary of consultation effort and relevant person responses			
• [VIC-SDFV-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-SDFV-02] Emperor Energy made a phone call on 28/04/2023, using the number on the website to follow up on the introduction email, but the number was disconnected. • [VIC-SDFV-03] Emperor Energy emailed on 4/05/2023, with a follow up email. • [VIC-SDFV-04] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#48] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#326] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**

• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Several attempts made to discuss the activity with relevant person with no feedback provided. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.9.8. Surfing Victoria

Summary of consultation effort and relevant person responses
• [VIC-SV-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-SV-02] Emperor Energy made a phone call on 1/05/2023 and spoke to Surfing Victoria to confirm the email was received with no comments at this time. SV would not like to meet but would like to be kept informed on the progress of the activity via email. • [VIC-SV-03] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#61] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#337] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Surfing Victoria advised that they do not wish to meet but requested that	• No claims or objections were raised.	• Emperor Energy has continued to consult Surfing Victoria by providing	• Emperor Energy considers the measures and controls in the EP

they are kept informed on the progress of that activity via email. • No objections or claims raised.	• Relevant person has been provided sufficient information, and has advised there is no need to meet or to be kept informed.	consultation information sheets via email.	addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.9.9. Windsurfing Victoria

Summary of consultation effort and relevant person responses
• [VIC-WV-01] Emperor Energy emailed on 24/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-WV-02] Emperor Energy made a phone call on 3/05/2023, left a voice mail on relevant staff member mobile, requesting a call back or email reply to confirm receipt of induction email. • [VIC-WV-03] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#78] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#374] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.9.10. Victorian Recreational Fishing

Summary of consultation effort and relevant person responses
• [VIC-VRF-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-VRF-002] Emperor Energy emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [VIC-VRF-03] Victoria Recreational Fishing emailed on 24/11/2024, auto-reply out of office.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in March 2023; no additional time has been requested.

3.9.11. Yachting Victoria

Summary of consultation effort and relevant person responses			
• [#124] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.9.12. Environment Victoria

Summary of consultation effort and relevant person responses
• [VIC-EV-01] Emperor Energy Emailed on 1/05/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-EV-02] EV emailed on 05/05/2023, request for stakeholder consultation timeframes and development of Environmental Plan timeframes. • [VIC-EV-03] EV emailed on 12/05/2023, auto-response. • [VIC-EV-04] Emperor Energy emailed on 12/05/2023, In response to query, request for feedback in the next 30 days, and provided expected timing for submission of EP. • [VIC-EV-05] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-EV-06] EV emailed on 13/12/2024, Auto-response stating Staff member email address is no longer correct and supplied correct email address to direct to

- Measures adopted: Contacts register updated.
- [VIC-EV-07] EV Emailed on 13/12/2024, auto-response stating Staff member email address is no longer correct. Supplied correct email address to direct emails to.
  - Measures adopted: Contacts register updated.
- [VIC-EV-08] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [VIC-EV-09] EV emailed on 16/12/2024, supplied updated contact email address for relevant staff member.
  - Measures adopted: Contacts register updated.
- [VIC-EV-10] EV emailed on 16/12/2024 supplied updated contact email address for relevant staff member.
  - Measures adopted: Contacts register updated.
- [VIC-EV-11] EV emailed on 8/01/2025, auto-reply.
- [#30] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#255] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• EV requested further information on stakeholder consultation timeframes and the EP development timeframe. • EV provided updated contact details. • No objections or claims raised.	• No claims or objections were raised. Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy provided timeframe for consultation (30 days) and expected timing submission of EP. • Emperor Energy have updated contact register in accordance with updated contact details provided by EV.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. Information requested was provided. No further information requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

3.9.13. First Peoples' Assembly of Victoria

Summary of consultation effort and relevant person responses			
• [#172] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#256] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.9.14. Marine and Safety Tasmania

Summary of consultation effort and relevant person responses
• [#98] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#278] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.10. State Local Council

3.10.1. NSW Local Government Area / Council: Bayside

Summary of consultation effort and relevant person responses			
• [#101] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#300] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.10.2. NSW Local Government Area / Council: Bega Valley

Summary of consultation effort and relevant person responses
• [NSW-BVSC-01] Emperor Energy emailed on 16/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-BVSC-02] BVSC emailed on 16/12/2022, auto reply message. • [NSW-BVSC-03] BVSC emailed on 21/12/2022, query on affected area relevant to the Bega Shire. o Emperor Energy measures adopted: provided the additional information that was requested. • [NSW-BVSC-04] Emperor Energy emailed on 21/12/2022, advised that coastal area could be affected in the unlikely event of a spill [requested information provided]. • [NSW-BVSC-05] Emperor Energy emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#35] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#302] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• BVSC requested further information on affected area relevant to Bega Shire.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle	• Emperor Energy supplied requested information on the potential coastal area of the Bega Valley Government	• Emperor Energy considers the measures and controls in the EP

• No objections or claims raised.	of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	Area that could be affected in the unlikely event of a spill.	addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. Additional information has been provided and there are no outstanding requests for further information. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

3.10.3. NSW Local Government Area / Council: Eurobodalla

Summary of consultation effort and relevant person responses
• [NSW-ESC-01] Emperor Energy emailed on 16/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-ESC-02] Eurobodalla Council emailed on 16/12/2022, auto reply message. • [NSW-ESC-03] Emperor Energy emailed on 23/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-ESC-04] Eurobodalla Council emailed on 16/12/2022, auto reply message, • [#39] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#303] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

3.10.4. NSW Local Government Area / Council: Kiama

Summary of consultation effort and relevant person responses
• [#100] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#304] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.10.5. NSW Local Government Area / Council: Mosman

Summary of consultation effort and relevant person responses			
• [#102] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#305] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.10.6. NSW Local Government Area / Council: Northern Beaches

Summary of consultation effort and relevant person responses
• [#99] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#306] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.10.7. NSW Local Government Area / Council: Randwick

Summary of consultation effort and relevant person responses			
• [#103] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#308] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.10.8. NSW Local Government Area / Council: Shellharbour

Summary of consultation effort and relevant person responses			
• [#106] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#307] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.10.9. NSW Local Government Area / Council: Shoalhaven

Summary of consultation effort and relevant person responses

- [NSW-SSC-01] Emperor Energy emailed on 16/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [NSW-SSC-02] Emperor Energy emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [NSW-SSC-03] Shoalhaven Council emailed on 16/12/2022, auto reply message.
- [#37] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#309] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

3.10.10. NSW Local Government Area / Council: Sydney

Summary of consultation effort and relevant person responses
• [#201] Council emailed on 28/10/2025, on behalf of CEO at the City of Sydney stating that the Lord Mayor has considered the request to meet in regards to the Judith-2 project and has declined the opportunity to meet.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Declined an opportunity to meet regarding the Judith-2 project. • No claims or objections	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. CEO was unable to meet following invitation from Emperor Energy. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.			

3.10.11. NSW Local Government Area / Council: Waverley

Summary of consultation effort and relevant person responses			
• [#105] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#311] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.10.12. NSW Local Government Area / Council: Wollongong

Summary of consultation effort and relevant person responses
• [#184] Emperor emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#310] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.10.13. NSW Local Government Area / Council: Woollahra

Summary of consultation effort and relevant person responses

- [#104] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website
- [#312] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.10.14. TAS Local Government Area / Council: Break O'Day

Summary of consultation effort and relevant person responses

- [TAS-BODC-01] Emperor Energy emailed on 16/12/2022 advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [TAS-BODC-02] Emperor Energy made a phone call on 2/05/2023 to confirm email was received. Advised the email will be forwarded to relevant department for feedback. Requested an email reply to determine if council would like ongoing consultation / had any queries / would like progress updates only.
- [TAS-BODC-03] Break O'Day Council emailed on 2/05/2023, responding that meeting is not necessary but suggested writing to council with details on the activity, including the proposed risk assessment for oil spill or other hazards for the municipality for the planned activities. Also queried if consultation with local fisheries, tourism and recreation stakeholders was being conducted. Provided link to list of local groups and organisations to consider for consultation.

- [TAS-BODC-04] Emperor Energy emailed on 12/05/2023, reply to acknowledge non-request for a meeting. Request for risk assessment acknowledged and will be provided when document is finalised. Confirmed Emperor Energy had contacted local fisheries and tourism, and requested contact details for any local fishers or tourism operators that may be relevant persons. Noted Emperor ran an advertisement in a regional paper that cover Break O'day Council.
- [TAS-BODC-05] Break O'Day Council emailed on 12/05/2023, auto response email.
- [TAS-BODC-06] Emperor Energy emailed on 28/01/2025, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Risk assessment provided noting Break O'Day Council on outer edge of EMBA with a very low probability of impact in the event of a spill, and no shorelines predicted to be impacted.
- [#59] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#341] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Break O'Day Council advised that meeting is not required but requested more information on the activity and potential impacts to council area via email. • Break O'Day Council queried if consultation with local fisheries, tourism and recreation stakeholders was being conducted.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy has continued to consult Break O'Day Council by providing consultation information sheets via email and providing information on risk assessments to determine potential impacts to Break O'Day in the unlikely event of an oil spill. • Emperor Energy confirms that consultation with local fisheries, tourism and recreation stakeholders has been undertaken.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. Additional information has been provided and there are no outstanding requests for further information. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

3.10.15. TAS Local Government Area / Council: Burnie

Summary of consultation effort and relevant person responses			
• [#115] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#340] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.10.16. TAS Local Government Area / Council: Central Coast

Summary of consultation effort and relevant person responses

- [#118] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#339] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.10.17. TAS Local Government Area / Council: Circular Head

Summary of consultation effort and relevant person responses

- [#113] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#342] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised.	N/A	• Emperor Energy considers the measures and controls in the EP

	• Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.		addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.10.18. TAS Local Government Area / Council: Devonport

Summary of consultation effort and relevant person responses
• [#112] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#343] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.10.19. TAS Local Government Area / Council: Dorset

Summary of consultation effort and relevant person responses
• [TAS-DC-01] Emperor Energy emailed on 24/04/2023 advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAS-DC-02] Dorset Council emailed on 24/04/2023, automatic reply. • [TAS-DC-03] Emperor Energy made a phone call on 3/05/2023, spoke to a staff member from Dorset Council who requested the email be resent for review. The email will be resent as requested. o Dorset Council staff member requested the email be resent for review. • [TAS-DC-04] Emperor Energy emailed on 3/05/2023 with the introduction email and attachments resent as requested during phone call. The email advised of the proposed activity and provided a Consultation Information Sheet (March 2023). The email also included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAS-DC-05] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAS-DC-06] Dorset Council emailed on 13/12/2024, auto-reply acknowledging email has been received. • [#56] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#344] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Dorset Council requested that initial consultation information resent for review. No feedback provided. • No objections or claims raised.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	• Consultation information resent to Dorset Council for review.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. Additional information has been provided and there are no outstanding requests for further information. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested

3.10.20. TAS Local Government Area / Council: Flinders

Summary of consultation effort and relevant person responses
• [TAS-FC-01] Emperor Energy emailed on 16/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAS-FC-02] Emperor Energy made a phone call on 3/05/2023, spoke to a staff member at Flinders Council. Email will be resent as requested. o Flinders Council requested the introduction email and information be resent for review. • [TAS-FC-03] Emperor Energy emailed on 3/05/2023 with the updated information email and attached information sheet, as requested during phone call. The email advised of the proposed activity and provided a Consultation Information Sheet (March 2023). The email also included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAS-FC-04] Emperor Energy emailed on 22/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#57] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#345] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Flinders Council requested that initial consultation information resent for review. No feedback provided.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle	• Consultation information resent to Flinders Council for review.	• Emperor Energy considers the measures and controls in the EP

• No objections or claims raised.	of an EP. Should feedback be received, Emperor Energy will apply the MoC process.		addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. Additional information has been provided and there are no outstanding requests for further information. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

3.10.21. TAS Local Government Area / Council: George Town

Summary of consultation effort and relevant person responses
• [#117] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#347] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.10.22. TAS Local Government Area / Council: Glamorgan-Spring Bay

Summary of consultation effort and relevant person responses			
• [#119] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#346] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.10.23. TAS Local Government Area / Council: Latrobe

Summary of consultation effort and relevant person responses
• [#114] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#349] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.10.24. TAS Local Government Area / Council: Launceston

Summary of consultation effort and relevant person responses			
• [#116] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#348] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.10.25. TAS Local Government Area / Council: Tasman

Summary of consultation effort and relevant person responses			
• [#121] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#350] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.10.26. TAS Local Government Area / Council: Waratah-Wynyard

Summary of consultation effort and relevant person responses

• [#123] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#351] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.10.27. VIC Local Government Area / Council: Bass Coast Shire

Summary of consultation effort and relevant person responses			
• [#120] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#361] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised.	N/A	• Emperor Energy considers the measures and controls in the EP

	• Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.		addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.10.28. VIC Local Government Area / Council: East Gippsland Shire

Summary of consultation effort and relevant person responses
• [VIC-EGSC-01] Emperor Energy emailed on 16/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-EGSC-02] Emperor Energy emailed on 23/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#67] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#360] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

3.10.29. VIC Local Government Area / Council: South Gippsland Shire

Summary of consultation effort and relevant person responses

- [VIC-SGSC-01] Emperor Energy emailed on 20/02/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [VIC-SGSC-02] South Gippsland Shire Council emailed on 20/02/2023, auto reply email.
- [VIC-SGSC-03] South Gippsland Shire Council emailed on 22/02/2023, requesting for a meeting to discuss the activity and spill plans (initial meeting over Teams or Zoom).
- [VIC-SGSC-04] South Gippsland Shire Council emailed on 10/05/2023, follow up email for the request for meeting to discuss the activity via Teams or Zoom.
- [VIC-SGSC-05] Emperor Energy replied to email on 12/05/2023, proposed meeting date sent.
- [VIC-SGSC-06] South Gippsland Shire Council replied to email on 15/05/2023, proposing a new meeting date for an online meeting as there was a conflict with previously proposed date.
- [VIC-SGSC-07] Emperor Energy emailed on 23/05/2023, asking if meeting date and time is still acceptable, if so, meeting invitation will be sent.
- [VIC-SGSC-08] South Gippsland Shire Council replied to email on 23/05/2023, Municipal Emergency Management Planning Committee and provided opportunity to meet
- [VIC-SGSC-09] Emperor Energy met with South Gippsland Shire Council on 24/05/2023.
  - Emperor Energy provided a project overview covering items included in the information sheet.
  - South Gippsland Shire suggested contacting staff member for Parks Victoria, and staff member of Qube Ports.
  - Measures adopted: New contacts added to relevant persons list.
- [VIC-SGSC-10] South Gippsland Shire Council emailed on 24/05/2023, appreciated overview and provided contacts for Parks Victoria, Port Anthony and Qube Ports.
- [VIC-SGSC-11] Emperor Energy emailed on 24/05/2025, follow up email providing OPEP and updated Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [VIC-SGSC-12] South Gippsland Shire Council emailed on 25/02/2025, Acknowledged receipt. Advised it would be shared with appropriate council officers and will contact if there are any queries. Queried communications with wider community.

- [VIC-SGSC-13] Emperor Energy replied to email on 25/02/2025, confirming Emperor is engaging with relevant stakeholders.
- [#66] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#363] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• South Gippsland Shire requested a meeting to discuss the activity and spill plans. • South Gippsland Shire suggested contacting staff members at Parks Victoria, Parks Anthony and Oube Ports. • South Gippsland Shire queried communications with wider community. • No claims or objections.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy met with South Gippsland Shire to discuss the activity and spill plans. • As per recommendations from South Gippsland Shire, Emperor Energy have added new contacts for Parks Victoria, Port Anthony and Oube Ports to the relevant persons list. • Emperor Energy have confirmed with South Gippsland Shire that engagement with relevant stakeholders is ongoing.	• New contacts for Parks Victoria, Port Anthony and Oube Ports added to relevant persons list and have been consulted on the activity (see Appendix D - Section 2.2.16, 3.5.1, 3.5.3).

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. Information requested has been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Feb 2023; no additional time has been requested.

3.10.30. VIC Local Government Area / Council: Wellington Shire

Summary of consultation effort and relevant person responses

- [VIC-WSC-01] Emperor Energy emailed on 20/03/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [VIC-WSC-02] Wellington Shire Council emailed on 20/03/2023, auto reply message.
- [[VIC-WSC-03] Emperor Energy emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [VIC-WSC-04] Wellington Shire Council emailed on 24/11/2024, auto reply message.
- [#64] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#362] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in March 2023; no additional time has been requested.

3.11. Tourism - Operator

3.11.1. Far Out Charters

Summary of consultation effort and relevant person responses

- [#94] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#257] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.11.2. Lakes Charter Fishing

Summary of consultation effort and relevant person responses

- [#165] Emperor Energy submitted online enquiry on 20/10/2025, seeking contact point to share information on the project.
- [#206] Lakes Charter Fishing emailed on 30/10/2025, seeking further information on area of operations and vessel ports. Information was provided on charter operations, which run from December-April out to 30 NM south to west of Lakes Entrance Bar. Email requested clarity on activities taking place in this time period and area that could affect the operations of Lakes Charter Fishing. Lakes Charter Fishing also expressed assistance that could be provided by the vessel.
- [#207] Emperor Energy emailed on 30/10/2025 providing further details on location and planned vessel, and port locations.
- [#208] Lakes Charter Fishing emailed on 30/10/2025 upon receipt of coordinates of Operational Area and vessel requirements, stating that the activity was not expected to interfere with operations. Further expression of potential opportunities for assistance from Lakes Charter Fishing were made.

- [#271] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Lakes Charter Fishing sought further information on area of operations, vessel ports, and more information on project activities and how it might impact Lakes Charter Fishing. • Lakes Charter provided information on charter operations that run between December to April 30 NM south to west of Lakes Entrance Bar • Lakes Charter Fishing acknowledging the location of the Operational Area and vessel requirements. • Lakes Charter stated the activity is not expected to interfere with Lakes Charter Fishing operations. Expressed interest in potential future assistance from with the activity.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy provided further details on location, planned vessel, and port locations.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.11.3. Peels Cruises

Summary of consultation effort and relevant person responses			
• [#107] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#317] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.12. Traditional Custodians and First Nations nominated representative corporations

3.12.1. Aboriginal Land Council of Tasmania

Summary of consultation effort and relevant person responses
• [TAS-ALCT-01] Emperor Energy emailed on 16/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAS-ALCT-02] Emperor Energy emailed on 16/12/2022, auto reply message – not public email.

- [TAS-ALCT-03] Emperor Energy emailed on 16/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [TAS-ALCT-04] Emperor Energy made a phone call on 21/12/2022, introduced Emperor Energy and that contacting ALCT in relation to Emperor's activities off Victoria and that we would like some support from them in 2023 as to how we would consult with Indigenous persons and groups. As we are new to this type of consultation, we are looking for some support.
  - ALCT provided updated contact email and would forward email onto the relevant person.
- [TAS-ALCT-05] Emperor Energy emailed on 21/12/2022 advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [TAS-ALCT-06] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Checked as to whether prior advice remained current.
- [#6] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#216] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• During a phone call, the Aboriginal Land Council of Tasmania advised that they would provide an updated email address and contact to forward onto the relevant person. • No claims or objections were raised.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy engaged via a phone call the Aboriginal Land Council of Tasmania to assess the preferred method of engagement	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

3.12.2. Bunurong Land Council Aboriginal Corporation

Summary of consultation effort and relevant person responses
• [VIC-BLCAC-01] Emperor Energy emailed on 30/10/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so. • [VIC-BLCAC-02] Bunurong LCAC emailed on 30/12/2024, auto-reply BLC Admin. • [VIC-BLCAC-03] Bunurong LCAC emailed on 30/12/2024, auto-reply BLC Admin. • [VIC-BLCAC-04] Emperor Energy emailed on 28/01/2025, follow up email to previous email and provided an opportunity to meet. • [VIC-BLCAC-05] Bunurong LCAC emailed on 29/01/2025, read receipt of staff member viewing email sent 28/01/2025. • [VIC-BLCAC-06] Bunurong LCAC emailed on 29/01/2025, read receipt of staff member viewing email sent 28/01/2025. • [VIC-BLCAC-07] Emperor Energy made a phone call on 7/02/2025, spoke with office staff who advised best contacts and supplied email addresses. I advised I would provide information on the project. o Bunurong LCAC provided updated email addresses for correct contacts and BLCAC. • [VIC-BLCAC-08] Emperor Energy emailed on 7/02/2025, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Checked as to whether prior advice remained current. • [#11] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#231] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• During a phone call with BLALC, an updated email address was provided to contact for further engagement. • No claims or objections were raised.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy engaged via a phone call BLALC to assess whether BLALC would like to be engaged on the project. The BLALC staff member provided an updated email to contact for further information.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.12.3. Circular Head Aboriginal Corporation

Summary of consultation effort and relevant person responses			
• [#179] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#233] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.12.4. First Tasmanians Aboriginal Corporation

Summary of consultation effort and relevant person responses			
• [#258] Emperor Energy emailed 21/11/2025, with email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party. • [#403] Emperor Energy emailed 03/03/2026, with follow-up email to First Tasmanians Aboriginal Corporation, if they have any further comment of feedback on the proposed Judith-2 plans and potential impacts.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in November 2025; no additional time has been requested.			

3.12.5. Flinders Island Aboriginal Association

Summary of consultation effort and relevant person responses			
• [#166] Emperor Energy submitted online enquiry on 20/10/2025, seeking contact point to share information on the project. • [#259] Emperor Energy emailed 21/11/2025, with email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**

• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.12.6. Gunaikurnai Land & Waters Aboriginal Corporation

Summary of consultation effort and relevant person responses
• [GLAWAC-01] Emperor Energy emailed on 16/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [GLAWAC-02] Gunaikurnai LAWAC emailed on 22/03/2023 to request to remain informed on the progress of the activity and meet for further discussions. • [GLAWAC-03] Emperor Energy emailed on 12/05/2023, acknowledgement of email and proposal date for online meeting. • [GLAWAC-04] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so. • [GLAWAC-05] Emperor Energy emailed on 28/01/2025, follow up email to the previous email. Provided an opportunity to meet. • [GLAWAC-06] Emperor Energy made a phone call on 07/02/2025, no answer to Gunaikurnai LAWAC office. Left a message stating I was following up on emails sent regarding the project and would try again early next week. • [GLAWAC-07] Gunaikurnai LAWAC made a phone call on 07/02/2025, return call from staff who advised they would inform the relevant person on the project and have them contact Emperor Energy. o Emperor Energy received return phone call from GLaWAC staff, who advised that they would follow up with the relevant person on the project and have them contact Emperor via phone call or reply to the email.

- [#268] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.
- [#380] Gunaikurnai LAWAC emailed 18/11/2025, to arrange a time to meet before the end of the year in person or online.
- [# 390] Emperor Energy emailed on 18/11/2025, thanking Gunaikurnai LAWAC for the opportunity to discuss the project and advised Emperor would be happy to meet in person. Provided a flyer with the activity information and timeframe for the project. Provided an excerpt of the cultural heritage section from the EP.
- [#386] Emperor Energy emailed 12/11/2025, to follow up after a call to provide information on the project and invite engagement with GLaWAC. Requested a call from GLaWAC
- [#387] Gunaikurnai LAWAC emailed on 17/11/2025, stating they will request the relevant person within GLaWAC to arrange a meeting in person or online. In the interim, requested information from Emperor Energy on the project for GLaWAC to familiarise themselves with and provided a link to the GLaWAC website for information on Gunaikurnai aspirations and expectations on engagement and partnerships Energy Transition and Pathways to Partnership guideline
- [#390] Emperor Energy called and provided follow-up email on 18/11/2025. Providing latest newsletter and extract from EP, no concerns raised at this time with the plans, keen to have a meeting to discuss future plans and engagement, Meeting set for Thursday 4th December.
- [#402] Emperor Energy, Steve Marshall held (rescheduled) online meeting with GLaWAC on 16th December. Emperor Energy provided overview of the planned operations, locations and discussed potential impacts to cultural heritage and wider environment. No issues raised for these planned operations, advised that future wider area development (of the Judith Field), will require additional consultation and that we should both embark on the GLaWAC Pathways to Partnership in the new year.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Requested to remain informed on the progress of the activity following an introduction email in 2022. • During a phone call with GLAWAC in 2024, GLaWAC advised they would follow up with the relevant person on the project regarding the stakeholder consultation emails sent. GLAWAC would contact Emperor via phone call or reply to the email.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor acknowledged request for engagement and proposed data for online meeting in 2022. No response was received and no meeting arranged • Emperor Energy engaged via a phone call in 2024 GLaWAC to assess whether GLAWAC would like to be engaged on the project. The GLaWAC staff member advised that GLaWAC would contact Emperor for further information if required	• Emperor Energy has considered relevant publicly available information on Gunakurnai Sea Country to inform the EP including publications, the Gunaikurnai Whole of Country Plan, and relevant geospatial data to describe the values and sensitivities of Gunaikurnai Sea Country. • Further, the appointment of appropriately qualified underwater archaeologist to review geophysical survey data gathered prior to

• GLaWAC provided opportunity to meet in person or online before the end of 2025. • Provided guides Gunaikurnai aspirations and expectations on engagement and partnerships Energy Transition and Pathways to Partnership guideline • No claims or objections were raised.		• Emperor Energy has continued to maintain contact with GLaWAC and is in the process of coordinating a meeting with GLaWAC • Has provided an overview of the activity, in addition to the cultural heritage excerpt from the EP to GLaWAC	finalising approach path, well location and MODU position (CM32), avoidance of identified maritime archaeological heritage and submerged archaeological heritage (CM35), and any new archaeological finds will be reported to the Australasian Underwater Cultural Heritage Database (AUCHD) within 21 days of discovery. • Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Expressed interest in consultation, but Emperor Energy has been unable to get any further response to calls or emails. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.			

3.12.7. Lake Tyers Aboriginal Trust

Summary of consultation effort and relevant person responses			
• [#164] Emperor Energy submitted online enquiry on 20/10/2025, seeking contact point to share information on the project.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person	• No claims or objections were raised.	N/A	• Emperor Energy considers the measures and controls in the EP

	• Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.		addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.12.8. Melaythenner Teeackana Warrana Aboriginal Corporation

Summary of consultation effort and relevant person responses			
• [#178] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#280] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.12.9. New South Wales Aboriginal Land Council

Summary of consultation effort and relevant person responses

- [NSW-ALC-01] Emperor Energy emailed on 16/12/2022, advising of the proposed activity and provided a Consultation Information Sheet (Dec 2022). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [NSW-ALC-02] ALC emailed on 16/12/2022, read receipt from staff member.
- [NSW-ALC-03] ALC emailed on 16/12/2022, read receipt from staff member.
- [NSW-ALC-04] Emperor Energy emailed on 14/03/2023, follow up email requesting information on ALC, specifically structure of the organisation and contact details for relevant groups within the Sydney/Newcastle and South Coast regions of the ALC.
- [NSW-ALC-05] Emperor Energy made a phone call on 14/03/2025 to ALC.
  - ALC provided overview of the ALC structure. Each LALC is independent with its own board and CEO, therefore, each LALC will need to be contacted for consultation.
- [NSW-ALC-06] ALC emailed on 14/03/2023, provided contact details sent for the Newcastle/Sydney LALC CEO's
- [NSW-ALC-07] Emperor Energy emailed on 14/03/2023, reply includes an overview of phone conversation.
- [NSW-ALC-08] Emperor Energy emailed on 15/03/2023, follow up to communicate that that there is no overlap with Newcastle/Sydney region LALCs and the socio-economic area of exposure. However, overlap exists with the South Coast region and will contact that zone for more information.
- [NSW-ALC-09] ALC emailed on 15/03/2023, acknowledged.
- [NSW-ALC-10] Emperor Energy made a phone call on 17/03/2023, to South Coast ALC - discussion on South Coast region, in particular informing of the Regional Forum cycle occurring every two months with the next taking place later this month.
  - ACL, communication with South Coast (SC) Region of the NSW Aboriginal Land Council (ALC). Information received on the meeting cycle for the SC ALC and contact details received for the LALCs within the SC region for further consultation.
- [NSW-ALC-11] Emperor Energy emailed on 17/03/2023, follow up email to the phone call advising of the proposed activity and provided a Consultation Information Sheet (Mar 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [NSW-ALC-12] Emperor Energy emailed on 20/03/2023, requesting contact information for CEOs of the South Coast region LALCs.
- [NSW-ALC-13] ALC emailed on 28/03/2023, contact information sent for South Coast region LALCs.
- [NSW-ALC-14] Emperor Energy emailed on 28/03/2023, reply from Emperor Energy acknowledging receipt of contact information for CEOs of the South Coast region LALCs.

- [NSW-ALC-15] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024), as to share with the Zone director information that was being sent to individual LALCs.
- [#133] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#283] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• During a phone call with ALC (14/03/2023), they provided the ALC structure stating that each LALC is independent with its own board and CEO and will need to be contacted individually for consultation. • Contact details for the Newcastle and Sydney LALC were provided via email • ALC acknowledged the email from Emperor Energy stating there was no overlap with the Newcastle/Sydney region LALCs. • During a phone call (17/03/2023), the South Coast Zone ALC provided information on the regional forum cycle which occurs every two months. • ALC provided contact information for the South Coast region LALCs. • No objections or claims raised.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• During a phone call (14/03/2023), Emperor Energy queried the ALC structure and acknowledged each LALC structure. • Emperor Energy confirmed via email that there is no overlap with the socio-economic area of exposure with the Newcastle/Sydney Region. However, advised there is overlap with the South Coast region and advised Emperor Energy will follow up with the relevant LALC in the South Coast. • During a phone call (17/03/2023), Emperor Energy enquired on engaging with the South Coast Zone ALC on further consultation. The ALC provided information on the regional forum which occurs every two months.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

		• Emperor Energy requested contact information for the CEOs of the South Coast region LALCs.	

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Primary function of ALC is support and guidance for individual LALCs, so no feedback expected. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in Dec 2022; no additional time has been requested.

3.12.10. NSW Local Aboriginal Land Council: Awabakal

Summary of consultation effort and relevant person responses
• [#135] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#284] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Primary function of ALC is support and guidance for individual LALCs, so no feedback expected.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.12.11. NSW Local Aboriginal Land Council: Bahtabah

Summary of consultation effort and relevant person responses			
• [#136] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#286] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.			

3.12.12. NSW Local Aboriginal Land Council: Batemans Bay

Summary of consultation effort and relevant person responses

- [NSW-BBALAC-01] Emperor Energy emailed on 3/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [NSW-BBLALC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so.
- [NSW-BBLALC-03] Emperor Energy emailed on 28/1/2025, follow up email to the previous email and provided an opportunity to meet.
- [NSW-BBLALC-04] Emperor Energy made a phone call on 7/02/2025, left a message with contact number and advised of a follow up next week.
- [NSW-BBLALC-05] Emperor Energy made a phone call on 12/02/2025, left a message advising of the follow up on the call from 7/02/2025 to follow up on consultation. Advised they could contact via phone or email.
- [#138] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#285] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.12.13. NSW Local Aboriginal Land Council: Bega

Summary of consultation effort and relevant person responses
• [NSW-BLALC-01] Emperor Energy emailed on 20/03/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-BLALC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so. • [NSW-BLALC-03] Emperor Energy emailed on 28/01/2025, follow up email to the previous email and provided an opportunity to meet. • [NSW-BLALC-04] Emperor Energy made a phone call on 7/02/2025, spoke with administration who advised the email of the best contact. o Bega advised they would address with member and provided email address. • [NSW-BLALC-05] Emperor Energy emailed on 7/02/2025, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so. • [#134] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#287] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• During a phone call (07/02/2025) on the best way to engage with the LALC, a member of administration advised of the best contact email address regarding consultation of the activity. • No objections or claims were raised.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• During a phone call (07/02/2025) Emperor Energy queried the best way to engage with the LALC and the most appropriate contact. • Emperor Energy followed up with an email to the new contact to request guidance as to whether management could act on behalf of members and requested that email be shared with	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

		members if appropriate to do so. No reply was received.	

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Email was directed to person as advised by administrative staff. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in March 2023; no additional time has been requested.

3.12.14. NSW Local Aboriginal Land Council: Bodalla

Summary of consultation effort and relevant person responses
• [NSW-BodLALC-01] Emperor Energy emailed on 3/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-BodLALC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so • [NSW-BodLALC-03] Emperor Energy emailed on 28/01/2025, follow up email to the previous email and provided an opportunity to meet. • [NSW-BodLALC-04] Emperor Energy made a phone call on 7/02/2025, left a message with contact number and advised of a follow up phone call the next week. • [NSW-BodLALC-05] Emperor Energy made a phone call on 12/02/2025, left a message advising following up on the call from 7/02/2025 to follow up on consultation. Advised they could contact via phone or email. • [#137] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#195] Bodalla LALC emailed on 13/10/2025, auto-email notifying of invalid email account.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.		

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.12.15. NSW Local Aboriginal Land Council: Cobowra and Murramarang

Summary of consultation effort and relevant person responses
• [NSW-CLALC-01] Emperor Energy emailed on 3/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-CLALC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so. • [NSW-CLALC-03] Emperor Energy emailed on 28/01/2025, follow up email to the previous email and provided an opportunity to meet. • [NSW-CLALC-04] Emperor Energy made a phone call on 7/02/2025, spoke with staff member of Cobowra who is also staff member of Walbunja Aboriginal Corporation. Advised that we would coordinate a time for Emperor CEO to contact. o Cobowra LALC CEO advised that they would like to be consulted further under both of these corporations and advised that Cobowra Country is within Walbunja Country which is part of the same dreaming as Gunakurnai. The CEO also queried water depth throughout the Bass Strait area, which was discussed using bathymetry maps for the area. • [NSW-CLALC-05] Emperor Energy emailed on 7/02/2025, follow up email to phone call to arrange a time to discuss further with Emperor CEO. • [NSW-CLALC-06] Emperor Energy made a phone call on 13/02/2025, message bank was full so unable to leave a message. • [NSW-CLALC-07] Emperor Energy emailed on 17/02/2025, follow up email to previous phone calls. Requested to arrange a time to have a phone call with Cobowra and Emperor on 17/02/2025. Further context on low likelihood of impacts from a spill were provided and offers on how Emperor Energy could commit to covering costs for cultural knowledge holders to support response efforts in the unlikely event of a spill were provided. • [#149] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

- [#289] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Cobowra LALC CEO advised that he would like to be consulted further under the Cobowra LALC and Walbunja Aboriginal Corporation (Cobowra Country is within Walbunja Country which is part of the same dreaming as Gunaikurnai). • Cobowra LALC CEO queried water depths and bathymetry of Bass Strait area. • No objections or claims made.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy phoned Cobowra LALC to discuss the project. Acknowledged that Cobowra has the same dreaming as Gunaikurnai. • Water depth and bathymetry throughout Bass Strait area was discussed during the phone call using bathymetry maps for the area. No queries or objections were raised. • Following phone call with Cobowra LACL CEO, Emperor Energy have continued engagement. Several contact attempts made with no further response received. • Further consultation information provided via email in lieu of meeting.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received.

Regulation 25(3) requires provision of a reasonable period: Expressed interest in consultation, but Emperor Energy has been unable to get any further response to calls or emails. Context provided may have resulted in less interest in consultation. Relevant person was first contacted in April 2023; no additional time has been requested.

3.12.16. NSW Local Aboriginal Land Council: Darkinjung

Summary of consultation effort and relevant person responses			
• [#146] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#288] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person	• No claims or objections were raised. Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Regulation 25(3) requires provision of a reasonable period: Expressed interest in consultation, but Emperor Energy has been unable to get any further response to calls or emails. Context provided may have resulted in less interest in consultation. Relevant person was first contacted in October 2025; no additional time has been requested.			

3.12.17. NSW Local Aboriginal Land Council: Eden

Summary of consultation effort and relevant person responses
• [NSW-ELALC-01] Emperor Energy emailed on 20/03/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

- [NSW-ELALC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so
- [NSW-ELALC-03] Emperor Energy emailed 28/01/2025, Follow up email to the previous email. Provided an opportunity to meet.
- [NSW-ELALC-04] Emperor Energy made a phone calls on 10/02/2025 - phoned both numbers. Left a message for the a office with contact number and advised I would follow up next week.
- [NSW-ELALC-05] Emperor Energy made a phone call on 12/02/2025, and left a message advising I was following up on the call from the 07/02/2025 to follow up on consultation. Advised they could contact via phone or via email.
- [#142] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#291] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in March 2023; no additional time has been requested.

3.12.18. NSW Local Aboriginal Land Council: Illawarra

Summary of consultation effort and relevant person responses

- [NSW-ILALC-01] Emperor Energy emailed on 3/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [NSW-ILALC-02] Illawarra LALC emailed on 3/04/2025, reply stating wish to be consulted and request for meeting to further discuss.
- [NSW-ILALC-03] Emperor Energy emailed on 12/05/2023, reply acknowledging request for meeting and suggestion of online meeting to discuss, and then proposed in person meeting if required thereafter.
- [NSW-ILALC-04] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so
- [NSW-ILALC-05] Emperor Energy emailed on 28/01/2025, follow up email to the previous email and provided the opportunity to meet.
- [NSW-ILALC-06] Emperor Energy made a phone call on 10/02/2025, calling the office who provided the relevant email to contact. The staff member advised they would send it through and advise the relevant person.
  - Illawarra LALC provided best email address to contact and advised they would inform relevant person.
- [NSW-ILALC-07] Emperor Energy emailed on 10/02/2025, follow up email with the relevant email addresses following phone conversation. Advised of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so.
- [#143] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#290] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Illawarra LALC requested for in-person consultation. • Illawarra LALC provided contact address for consultation. • No objections or claims.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy phoned Illawarra LALC to provide information on the project and request the relevant contact details. • Emperor Energy contacted the relevant Illawarra LALC point of contact to provide an opportunity to	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

		meet with Illawarra LALC with no response. • Further consultation information was provided via email in lieu of in-person meeting.	

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Regulation 25(3) requires provision of a reasonable period: Confirmed information would go to CEO.

3.12.19. NSW Local Aboriginal Land Council: Jerrinja

Summary of consultation effort and relevant person responses
• [NSW-JLALC-01] Emperor Energy emailed on 3/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-JLALC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so • [NSW-JLALC-03] Emperor Energy emailed on 28/01/2025, follow up email to the previous email and provided an opportunity to meet. • [NSW-JLALC-04] Emperor Energy made a phone calls on 10/02/2025, calling both contact numbers, including admin office. No answer so left a contact number and advised Emperor would try to call again later in the week. • [NSW-JLALC-05] Emperor Energy made a phone call on 12/02/2025 to the office, and left a message advising Emperor Energy was following up on the call from 7/02/2025 to follow up on consultation Advised they could contact Emperor via phone or email. • [#141] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#292] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.12.20. NSW Local Aboriginal Land Council: La Perouse

Summary of consultation effort and relevant person responses			
• [#182] Emperor emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#293] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.12.21. NSW Local Aboriginal Land Council: Merrimans

Summary of consultation effort and relevant person responses
• [NSW-MLALC-01] Emperor Energy emailed on 3/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-MLALC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so. • [NSW-MLALC-03] Merrimans LALC emailed on 19/12/2024, requesting for in person consultation. No request for information. • [NSW-MLALC-04] Emperor Energy emailed on 30/12/2024, advised information consultation with Traditional Owners of Judith-2 well location and provided opportunity to meet. • [NSW-MLALC-05] Emperor Energy emailed on 28/01/2025, follow up email to the previous email and provided an opportunity to meet. • [#140] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#294] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Merrimans LALC requested for in-person consultation. • No objections or claims.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be	• Emperor Energy provided opportunity to meet with Merrimans LALC with no response.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

	received, Emperor Energy will apply the MoC process.	• Further consultation information was provided via email in lieu of in-person meeting.	

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Regulation 25(3) requires provision of a reasonable period: Expressed interest in consultation, but Emperor Energy has been unable to get any further response to calls or emails. Relevant person was first contacted in April 2023; no additional time has been requested.

3.12.22. NSW Local Aboriginal Land Council: Metropolitan

Summary of consultation effort and relevant person responses
• [#183] Emperor emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#295] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.12.23. NSW Local Aboriginal Land Council: Mogo

Summary of consultation effort and relevant person responses
• [NSW-MogolALC-01] Emperor Energy emailed on 3/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-MogoLALC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so. • [NSW-MogoLALC-03] Emperor Energy emailed on 28/01/2025, follow up email to the previous email and provided the opportunity to meet. • [NSW-MogoLALC-04] Emperor Energy made a phone call on 10/02/2025, follow up phone call. Unable to leave a message. • [NSW-MogoLALC-05] Emperor Energy made a phone call on 12/02/2025, follow up phone call. Unable to leave a message. • [#144] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#296] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.12.24. NSW Local Aboriginal Land Council: Ngambri

Summary of consultation effort and relevant person responses			
• [NSW-NLALC-01] Emperor Energy emailed on 3/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-NLALC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so. • [NSW-NLALC-03] Emperor Energy emailed on 28/01/2025, follow up email to the previous email and provided the opportunity to meet. • [NSW-NLALC-04] Emperor Energy made a phone call on 10/02/2025 and spoke with NLALC staff member. o Ngambri LALC staff member advised that Ngambri is located near Canberra, inland and an offshore project is unlikely to impact Ngambri Country. They advised that the relevant staff member will reply to the emails sent if they deem it relevant to Ngambri Country. • [#145] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#297] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• NLALC staff member advised that the activity is unlikely to impact Ngambri Country. • NLALC advised that staff member will reply to the emails sent if they deem it relevant to Ngambri Country. • No objections or claims raised.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy engaged with Ngambri LALC to provide opportunity for consultation. Emperor Energy acknowledged that Ngambri LALC response that the activity is unlikely to impact Ngambri Country.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			

Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. While admin staff noted no concerns, Emperor Energy is uncertain as to authority to speak on cultural matters. Confirmed information would go to CEO but no further response received.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.12.25. NSW Local Aboriginal Land Council: Nowra

Summary of consultation effort and relevant person responses
• [NSW-NowLALC-01] Emperor Energy emailed on 3/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-NowLALC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so. • [NSW-NowLALC-03] Emperor Energy emailed on 28/01/2025, follow up email to the previous email and provided the opportunity to meet. • [NSW-NowLALC-04] Emperor Energy made a phone call on 12/02/2025 to Nowra LALC. There was no answer, left a message on the project. • [NSW-NowALAC-05] Nowra LALC returned the phone call on 12/02/2025, a member of the board advised that they would like the project with the board at an upcoming AGM. Advised they would like to be consulted further and may have members that might be interested in the project. • [NSW-NowLALC-06] Emperor Energy emailed on 12/02/2025, follow up email to the phone call to discuss further consultation. Advised that Nowra is on the outer extent of the EMBA. Provided the opportunity to meet should the board decide they would like to be consulted after the AGM decision. • [#151] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#298] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Nowra LALC returned a phone call made by Emperor Energy and advised they would raise the project	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle	• Emperor Energy acknowledged Nowra LALC request for further engagement and advised that the	• Emperor Energy considers the measures and controls in the EP

at an upcoming AGM, and advised they would like to be consulted further and that members may have an interest in the project. • No claims or objections were raised.	of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	location of Nowra LALC is on the outer extent of the EMBA, but provided an opportunity to meet should the board decide they would like to be consulted further. • No response received following advice.	addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Expressed interest in consultation, but Emperor Energy has been unable to get any further response to calls or emails. Context provided may have resulted in less interest in consultation. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.12.26. NSW Local Aboriginal Land Council: Ulladulla

Summary of consultation effort and relevant person responses
• [NSW-ULALC-01] Emperor Energy emailed on 20/03/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-ULALC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so • [NSW-ULALC-03] Emperor Energy emailed on 28/01/2025, follow up email to the previous email and provided the opportunity to meet. • [NSW-ULALC-04] Emperor Energy made a phone call on 12/02/2025, spoke with a staff member who advised to send another follow up email. Staff also took Emperor contact details and advised they would inform the relevant staff member of the call. o Ulladulla ULALC staff member advised to send follow up email and advised they would inform the relevant staff member of the project. • [NSW-ULALC-05] Emperor Energy emailed on 12/02/2025, follow up email providing information as advised by phone call with Ulladulla LALC office.

- [NSW-ULALC-06] Ulladulla LALC emailed on 13/02/2025, from staff member stating a change of members and that the matter has not been raised with the board or members as Gippsland is not within the cultural boundary. Staff member stated personal view against offshore drilling and recommended consultation be taken with relevant Gippsland Traditional Owners.
- [NSW-ULALC-07] Emperor Energy emailed on 14/02/2025, acknowledging response and confirmed consultation has been undertaken with Gunaikurnai.
- [#148] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#301] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• During a phone call on 12/02/2025, Ulladulla ULALC advised Emperor to send an additional follow up email to earlier consultation engagement. Advised they would notify the relevant person of the call and to expect the email. • Ulladulla ULALC that the matter has not been raised with the board or members as Gippsland is not within the cultural boundary. Staff member stated personal view against offshore drilling and recommended consultation be taken with relevant Gippsland Traditional Owners.	• No claims or objections were raised that are relevant to the activity. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy called Ulladulla ULALC to advise on the project and request feedback. • Emperor Energy acknowledged Ulladulla ULALC view on oil and gas operations and confirmed that consultation has been undertaken with Gunaikurnai.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone; ULALC advised by email that the area is outside their cultural boundary, so no further consultation required.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in March 2023; no additional time has been requested.

3.12.27. NSW Local Aboriginal Land Council: Wagonga

Summary of consultation effort and relevant person responses
• [NSW-WLALC-01] Emperor Energy emailed on 3/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [NSW-WLALC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Requested guidance as to whether management could act on behalf of members and requested that email be shared with members if appropriate to do so • [NSW-WLALC-03] Emperor Energy emailed on 28/01/2025, follow up email to the previous email and provided the opportunity to meet. • [NSW-WLALC-04] Emperor Energy made a phone call on 12/02/2025, follow up phone call to previous email. No answer so left a voicemail providing contact number and details of the email sent. • [#147] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#299] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone.

Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

3.12.28. Six Rivers Aboriginal Corporation

Summary of consultation effort and relevant person responses			
• [#167] Emperor Energy submitted online enquiry on 20/10/2025, seeking contact point to share information on the project.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

3.12.29. Tasmanian Aboriginal Centre

Summary of consultation effort and relevant person responses
• [TAC-01 Emperor Energy emailed on 20/03/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAC-02] Emperor Energy emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

• [#150] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#352] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Additional contact made by phone, but no further response received. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in March 2023; no additional time has been requested.			

3.12.30. Victorian Aboriginal Corporation for Languages

Summary of consultation effort and relevant person responses			
• [#173] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#365] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**

• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in October 2025; no additional time has been requested.

3.12.31. Victorian Aboriginal Heritage Council

Summary of consultation effort and relevant person responses
• [VIC-VAHC-01] Emperor Energy emailed on 20/03/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [VIC-VAHC-02] VAHC replied to email on 22/03/2023 to advise that the activity is on Gunaikurnai Country and to contact them for information • [VIC-VAHC-03] Emperor Energy emailed on 12/05/2023 to inform VAHC that we have been in contact with the Gunaikurnai Land and Waters Aboriginal Corporation. Asked if they would want to be consulted or kept informed on the project • [VIC-VAHC-04] VAHC emailed on 19/05/2023, requesting to be kept informed of any updates • [VIC-VAHC-05] Emperor Energy emailed on 24/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. Also noted that Emperor Energy would continue to consult with GLaWAC • [#161] Emperor Energy emailed on 20/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#366] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• VAHC advised that Judith-2 is on Gunaikurnai Country and Gunaikurnai Land and Waters Aboriginal Corporation are the best contact for Judith-2 Sea Country engagement • VAHC advised they would like to be informed of any project updates • No claims or objections were raised.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy acknowledged VAHC's request to engage with Gunaikurnai Land and Waters Aboriginal Corporation, and advised that engagement has been conducted. • Emperor Energy continued to provide project updates as per VAHCs request.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheets as described in Section 7.5 have been provided. No further information has been requested. Advice provided by VAHC has been followed. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in March 2023; no additional time has been requested.			

4. 25(1)(e) - Other relevant person or organisation

4.1.Other Parties

4.1.1. Australian Marine Oil Spill Centre

Summary of consultation effort and relevant person responses
• [AMOSC-01] Emperor Energy met with AMOSC 11/05/2023, to provide overview of Judith-2 project and provide overview of oil spill trajectory • [AMOSC-02] Emperor Energy emailed 29/05/2023, to thank AMOSC for their meeting to discuss overview of Judith-2 project and provide overview of oil spill trajectory modelling and proposed response strategies. Provided copy of the presentation slides for AMOSC. Queried AMOSC assistance to obtain additional assistance with the definition of peak IMT / field response requirements based on the worst case trajectory modelling, principally around the SCAT, Protect & Deflect (P&D), Shoreline Cleanup and OWR equipment and resource estimates, consistent with the worst case deterministic modelling that has been conducted. • [AMOSC-03] Emperor Energy emailed 24/06/2023, provided copy of OPEP Rev B 2023 and queried if AMOSC had the capacity to provide a proposal for IMT/Field response resourcing requirements. • [AMOSC-04] AMOSC emailed 03/07/2023, stating that they understand AMOSC employee has reached out to Emperor Energy in regards to the proposal. Stated they are on leave for another week. • [AMOSC-05] Emperor Energy emailed 03/07/2023, acknowledged that AMOSC employee has contacted Emperor Energy to discuss spill response requirements. • [AMOSC-06] Emperor Energy emailed 28/07/2023, to request AMOSC proposal for peak IMT / field response requirements for the Judith-2 well • [AMOSC-07] Emperor Energy emailed 17/03/2025, to thank AMOSC for their discussion via phone to discuss AMOSC support for IMT / field response requirements for the Judith-2 well and to discuss AMOSC membership costs. • [AMOSC-08] AMOSC emailed 17/03/2025, confirmed membership costs. Stated they would require a day and a half to review Judith-2 strategies and tactics to align against AMOSC capabilities. Stated that for IMT/OSR review, more time would be required to review. • [AMOSC-09] Emperor Energy emailed 19/03/2025, queried joining fees for AMOSC membership. • [AMOSC-10] AMOSC emailed 03/04/2025, provided clarifications on membership joining fees for calendar years. • [AMOSC-11] Emperor Energy emailed 06/04/2025, confirmed if AMOSC can provide a quote and estimated timeframe/availability to conduct IMT/Field response team peak resourcing analysis for LOC on Judith-2. Attached a copy of the current OPEP draft and RPS oil spill modelling • [#223] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Emperor Energy met with AMOSC to provide overview of activity. No claims and objections raised • AMOSC provided information for AMOSC support for IMT / field response requirements for the Judith-2 well • An agreement for support for the activity is being undertaken • No claims or objections raised	• No claims or objections were raised. • Measures and response capabilities have been incorporated into the OPEP • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy met with AMOSC to provide overview of activity • Emperor Energy queried support for IMT / field response requirements for the Judith-2 well • Ongoing correspondence is being undertaken to obtain support for IMT / field response requirements for the Judith-2 well	• Measures and response capabilities have been incorporated into the OPEP • Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.			

4.1.2. Fathom Pacific

Summary of consultation effort and relevant person responses
• [VIC-FP-01] Emperor Energy emailed on 24/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-FP-02] Emperor Energy made a phone call on 3/05/2023, left a voice mail on relevant staff member mobile, requesting a call back or email reply to confirm receipt of induction email. • [VIC-FP-03] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#28] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

4.1.3. iXblue

Summary of consultation effort and relevant person responses			
• [iXblue-01] Emperor Energy emailed on 17/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [iXblue-02] Emperor Energy made a phone call on 1/05/2023, however the number was unavailable. • [iXblue-03] Emperor Energy sent a follow up email on 4/05/2023. • [iXblue-04] Emperor Energy emailed on 27/11/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#34] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.			
Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle	N/A	• Emperor Energy considers the measures and controls in the EP

	of an EP. Should feedback be received, Emperor Energy will apply the MoC process.		addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

4.2.Tourism – Body or Agency

4.2.1. Australian Tourism Industry Council

Summary of consultation effort and relevant person responses
• [ATIC-01] Emperor Energy emailed on 24/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [ATIC-02] Emperor Energy emailed on 13/12/2024, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website • [#12] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#227] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

4.2.2. Destination Gippsland

Summary of consultation effort and relevant person responses			
• [VIC-DG-01] Emperor Energy emailed on 24/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VIC-DG-02] DG replied to the email on 24/04/2023, informing DG are unable to meet for consultation but would like to be kept informed on project updates. • [VIC-DG-03] Emperor Energy replied to the email on 24/04/2023, confirming that Emperor will keep DG informed of the updates. • [VIC-DG-04] Emperor Energy emailed on 13/12/204, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#21] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#248] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• DG informed they are unable to meet for consultation, but would like to be informed on project updates. • No claims or objections raised.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy confirmed DG request to not meet but remain informed of the project, which Emperor Energy has continued to do.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			

Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

4.2.3. Destination NSW

Summary of consultation effort and relevant person responses			
• [NSW-DNSW-01] Emperor Energy submitted online enquiry on website on 19/12/2024, to request email address for consultation purposes • [NSW-DNSW-02] Destination NSW emailed on 19/12/2024, auto-response acknowledging response of enquiry			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

4.2.4. Tourism Tasmania

Summary of consultation effort and relevant person responses
• [TAS-TT-01] Emperor Energy emailed on 24/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [TAS-TT-02] TT emailed on 8/05/2023, confirming correspondence was shared with relevant tourism organisations: West by North West and Visit Northern Tasmania.

- [TAS-TT-03] Emperor Energy emailed on 12/05/2023, acknowledging email from TT sent on 8/05/2023.
- [TAS-TT-04] Emperor Energy emailed on 13/12/204, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#54] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.
- [#356] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• TT shared correspondence with relevant tourism organisations (West by North West and Visit Northen Tasmania).	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy acknowledged TT's advice to engage with West by North West and Visit Northern Tasmania and has included in relevant stakeholder engagement.	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.

4.2.5. Victorian Tourism Industry Council

Summary of consultation effort and relevant person responses
• [VTIC-01] Emperor Energy emailed on 24/04/2023, advising of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VTIC-02] Emperor Energy emailed on 26/02/2025, advising of the proposed activity and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#71] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

• [#369] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.			
Relevant person objections, claims or other feedback	**Titleholder assessment of the merits**	**Titleholder statement of response**	**Details of the measures adopted**
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.
Consultation demonstration statement			
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in April 2023; no additional time has been requested.			

4.2.6. Visit Northern Tasmania

Summary of consultation effort and relevant person responses
• [TAS-TT-02] Emperor Energy emailed on 8/05/2023, forwarding correspondence by Tourism Tasmania as per correspondence # TAS-TT-02. The email advised of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [VNT-01] Emperor Energy emailed on 13/12/2024, with correspondence with Tourism Tasmania and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#73] Emperor Energy emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website. • [#370] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

- [#381] Emperor Energy emailed 24/11/2025, stating they had received an out of office for a contact with Visit Northern Tasmania. Requested whether they required more time
- [#388] Visit Northern Tasmania emailed 24/11/2025, stating that the employee CC'd could not provide comment as the relevant employee is currently out of office. Stated they would return on 1 Dec 2025. Stated that if that date is too late for submission of feedback then we will have to opt out of providing such on this occasion.
- [#389] Emperor Energy emailed on 24/11/2025, stating they will keep the relevant contact informed on the project, and invited any future comments or concerns on the project (regardless of date of submission)

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• Stated that the relevant person who could comment on the project was out of office and would not return prior to the submission date and would opt out of consultation for this consultation period. Did not request additional time. • No claims or objections raised	• No claims or objections were raised. Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	• Emperor Energy stated they will keep the relevant contact informed on the project, and invited any future comments or concerns on the project (regardless of date of submission)	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement
Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding. Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested,

4.2.7. West by North West

Summary of consultation effort and relevant person responses
• [TAS-TT-02] Emperor Energy emailed on 8/05/2023, forwarding correspondence by Tourism Tasmania as per correspondence # TAS-TT-02. The email advised of the proposed activity and provided a Consultation Information Sheet (March 2023). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website.

- [WBNW-01] Emperor Energy emailed on 2/12/2024, as per correspondence with Tourism Tasmania and provided a Consultation Information Sheet (Version 2, November 2024). The email included an offer to meet, activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website
- [#75] Emperor emailed on 13/10/2025, advising of the proposed activity and provided a Consultation Information Sheet (Oct 2025 Newsletter). The email included an activity summary, information for how to provide feedback for the EP development through consultation, and a link to Emperor Energy's website
- [#191] West by North West emailed on 13/10/2025, automatic email for one of the contacts advising they are on extended leave and provided alternative contact details
- [#372] Emperor Energy emailed 21/11/2025, with follow up email advising of the proposed activity. The email provided a link to the Emperor Energy website for further information on the activity, and invited feedback on the activity and an option to opt out of further communication if they deem themselves not a relevant party.

Relevant person objections, claims or other feedback	Titleholder assessment of the merits	Titleholder statement of response	Details of the measures adopted
• No response was received from the relevant person.	• No claims or objections were raised. • Emperor Energy engages in consultation throughout the lifecycle of an EP. Should feedback be received, Emperor Energy will apply the MoC process.	N/A	• Emperor Energy considers the measures and controls in the EP addresses the stakeholders functions, interests or activities.

Consultation demonstration statement

Regulation 25(2) requires provision of sufficient information: Information sheet as described in Section 7.5 have been provided. No further information has been requested, and no matters raised remain outstanding.
Regulation 25(3) requires provision of a reasonable period: Relevant person was first contacted in May 2023; no additional time has been requested.

APPENDIX E GHG EMISSIONS ASSESSMENT

Emperor Energy Ltd

Judith EP Update

GHG Emissions Technical Summary

ASSIGNMENT P100245-S03
DOCUMENT P-100245-S03-A-REPT-001

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REVISIONS & APPROVALS

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REV	DATE	DESCRIPTION	ISSUED	CHECKED	APPROVED	CLIENT
R01	17/10/2025	Issued for Review	MH	AC	AC	
R0	27/03/2025	Issued for Use	FC	MH	KR	Emperor/AGR

GHG EMISSIONS TECHNICAL SUMMARY

A GHG assessment was conducted to estimate the GHG emissions generated from Judith-2 Exploration Well activity. The GHG assessment covers all emissions scopes – scopes 1, 2 and scope 3, defined as below:

- Scope 1 emissions are the direct GHG emissions released into the atmosphere as a result of the activity, e.g., flaring and venting.
- Scope 2 emissions are the indirect GHG emissions from the consumption of purchased electricity, steam, heat or cooling, which are produced outside the boundary of the activity. Given there is no purchased electricity/energy involved, there will be no scope 2 emissions.
- Scope 3 emissions are the indirect GHG emissions, other than the scope 2 emissions, generated as a result of the activity. Scope 3 emissions cover both upstream (e.g., purchased goods and services and capital goods), downstream (e.g., waste treatment/disposal), vessel (and MODU) operations, and helicopter operations.

The GHG emissions sources and scope included in the assessment and relevant to the activity are summarised in Table 1. Scope 1 emissions were estimated according to the methodology in NGER Determination 2008 and scope 3 emissions were estimated according to the GHG Protocol Scope 3 Standard. Emissions from fugitives and employee commuting (road travel and fixed wing aircraft) were assumed to be immaterial.

Table 1: Emissions sources and scopes included in the GHG assessment.

Scope	Site Surveys	Drilling Activities
Scope 1	-	• Flaring during well test
Scope 3	Vessels (including ROV)[1]	• Vessels and MODU (including ROV)[1] • Helicopter • Materials[2] • Waste generated[3]

[1] Included vessel and MODU activities within the operational area only, as per the EP scope.
[2] Included embodied carbon for the major items only – cement, casing, and water-based mud (WBM).
[3] Included landfilling of the wellhead retrieved assuming immaterial emissions from waste discharge.

As summarised in Table 2, the total GHG emissions resulting from the activity are expected to be approximately 46 kt CO_2-e, consisting of 56% and 44% of scope 1 and scope 3 respectively. The GHG emissions were estimated using the maximum durations of the activities and flared volume.

Drilling activities (including well test and well P&A) are expected to generate approximately 31 kt CO_2-e, ~67% of the total GHG emissions, whilst support activities (vessels and helicopter) are expected to generate approximately 15 kt CO_2-e, ~33% of the total GHG emissions.

Table 2: Summary of GHG assessment results.

Emissions Source \ Scope	Scope 1 Emissions	Scope 3 Emissions	Total Emissions	Percentage
	t CO_2-e	t CO_2-e	t CO_2-e	%
Drilling Activities	25,960	5,230	31,190	67.7%
Flaring[1]	25,960		25,960	56.4%
Materials[2]		4,710	4,710	10.2%
Waste[3]		520	520	1.1%
Support Activities		14,860	14,860	32.3%
Vessels[4]		14,830	14,830	32.2%
Helicopter[5]		30	30	0.1%
Total GHG Emissions (t CO_2-e)	25,960	20,090	46,050	100.0
Percentages (%)	56.4	43.6	100.0	-

[1] Well test flaring at 60 MMscf/d, for up to 144 hours.
[2] Major materials required for well drilling and well P&A: 600 t cement; 940 t casing; and 400 m^3 WBM.
[3] Weight of wellhead retrieved for landfill: 400 tonnes.
[4] Vessels and MODU for the drilling activities up to 60 days; semisubmersible MODU type on DP used for conservatism; site surveys up to 9 days; vertical seismic profiling for 4 hours and post operation ROV survey up to 2 days.
[5] Helicopter flights 5 times a week on average during drilling activities, with a flight distance of ~50 km.

APPENDIX F JASCO UNDERWATER ACOUSTIC MODELLING REPORT

Emperor Energy Judith–2 Drilling Operations

Acoustic Modelling for Assessing Marine Fauna Sound Exposures

JASCO Applied Sciences (Australia) Pty Ltd

26 March 2025

Submitted to:

Phil McNamara
Emperor Energy
Contract 2025-04

Authors:

Justina Liu
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Thomas J. Stephen
Matthew W. Koessler

P001950-001
Document 03657
Version 2.0

JASCO APPLIED SCIENCES

Suggested citation:

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Disclaimer: The results presented herein are relevant within the specific context described in this report. They could be misinterpreted if not considered in the light of all the information contained in this report. Accordingly, if information from this report is used in documents released to the public or to regulatory bodies, such documents must clearly cite the original report, which shall be made readily available to the recipients in integral and unedited form.

Authorship statement: Individual authors of this report may have only contributed to portions of the document and thus not be responsible for the entire content. This report may contain standardized (boilerplate) components that are common property of JASCO and are not directly attributed to their original authors/creators. The entire content of this report has been subject to senior scientific review by the qualified person listed in the front matter of the document.

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Executive Summary

JASCO Applied Sciences (JASCO) performed a modelling study of underwater sound levels associated with Emperor Energy's drilling Judith-2 exploration activities and operations. The considered noise generating activities include drilling and vessel operations, vertical seismic profiling (VSP) and a 2D seismic survey for shallow water hazard identification. This study can be used to assist in understanding the potential acoustic impact on key regional receptors including marine mammals, sea turtles, and fish.

Five vessel and drilling operation scenarios were considered in this study. One scenarios considered three Anchor Handling Tug Support (AHTS) vessels setting up (two on transit and one under dynamic positioning). Once scenario considered the Mobile Offshore Drilling Unit (MODU) conducting drilling operations. Two scenarios considered the MODU with an associated offshore supply vessel (OSV) either conducting re–supply of the MODU under DP for 8 hours, or standing by under slow transit. The final modelled vessel scenario considered an ROV cutter at the seafloor performing cutting operations at the MODU location, supported by an OSV on stand-by. This study considered scenarios to represent operations that could occur concurrently.

For the consideration of VSP, one site was modelled considering a 600 in^3 static seismic source. The modelling assumed that a VSP is stationed at the centre of the Judith-2 well location. A total of 5, 10, 25, 50, 100, 150, 200, 250, and 300 impulses were considered independently to inform the assessment of different operational configurations over a 24 hour period.

For the shallow hazards seismic survey, one 24–hour acquisition scenario was modelled considering a single 160 in^3 seismic source. The acquisition pattern comprised a 1x1 km square area centred around the Judith-2 well location. The model parameterisation considered a survey vessel sailing along the transect lines at 8 knots, towing one 160 in^3 source, with an impulse interval (inter–pulse interval) of 22.2 m and a line separation of 100 m. For modelling purposes, the seismic source was assumed not to operate during line turns. The modelled scenario comprised 495 impulses during the 24–hour scenario.

This modelling study specifically assessed distances from operations where underwater sound levels reached thresholds corresponding to behavioural response, temporary reduction in hearing sensitivity or TTS, permanent threshold shift or PTS. The animals considered here included low–, high–, and very high–frequency cetaceans, otariid seals, fish (including fish larvae and eggs), and sea turtles.

The modelling methodology considered scenario–specific source levels and range–dependent environmental properties. Estimated underwater acoustic levels for non–impulsive (continuous) noise sources are presented as sound pressure levels (SPL, L_p), and as accumulated sound exposure levels (SEL, L_E) as appropriate for different noise effect criteria. The SPL metric is the root–mean–square pressure level over a stated frequency band over a specified time window. In this study, for continuous noise, a time window of 1 s was used.

In this report, to evaluate the potential for accumulated sound exposure levels (SEL), the duration of the SEL accumulation was defined as integrated over a 24–hour period. The SEL_{24h} is a cumulative metric that reflects the dosimetric impact of noise levels within 24 hours based on the assumption that an animal is consistently exposed to such noise levels at a fixed position. The corresponding SEL_{24h} radii represent an unlikely worst–case scenario. More realistically, marine mammals (as well as fish and turtles) would not stay in the same location for 24 hours. Therefore, a reported radius for SEL_{24h} criteria does not mean that marine fauna travelling within this radius of the source will be injured, but rather that an animal could be exposed to the sound level associated with impairment if it remained in that location for 24 hours.

The key results of this modelling study are summarised in the marine mammal, sea turtle and fish sections below. Maps are provided in the report to assist with contextualising tabulated distances.

Vessel and Drilling Modelling – Marine Mammals

The maximum distances to the NOAA (2024) marine mammal behavioural response criterion of 120 dB re 1 µPa (SPL, for continuous noise) ranged between 2.24 km (Scenario 2) and 23.7 km (Scenario 1) (Table 1). For TTS, the maximum distance for accumulated weighted SEL_{24h} scenarios was between 0.31 km (Scenario 5, VHF cetaceans) and 8.20 km (Scenario 1, LF cetaceans). For PTS, the maximum distances for accumulated weighted SEL_{24h} criteria from NMFS (2024) varied between distances of 0.03 m (Scenario 5, VHF cetaceans) and 0.44 km (in Scenario 1, LF cetaceans).

Table 1. Summary of marine mammal results from vessel and drilling modelling: Summary of maximum (R_{max}) horizontal distances (in km), from all scenarios considered, to the NOAA (2024) marine mammal behavioural response criterion of 120 dB re 1 µPa (SPL, unweighted) and frequency–weighted SEL_{24h} TTS and PTS thresholds based on NMFS (2024). TTS and PTS results are presented for the hearing group that resulted in the maximum range.

Scenario Number	Description	Marine Mammal Behavioural Response – SPL [a] R_{max} (km)	TTS – SEL_{24h} [b]	PTS – SEL_{24h} [b]
			R_{max} (km)	R_{max} (km)
1	Prelay and Anchor Setup	23.7	8.20 (LF-cetacean)	0.44 (LF-cetacean)
2	MODU Drilling	2.24	0.99 (VHF-cetacean)	0.06 (VHF-cetacean)
3	MODU Drilling with OSV on Standby	3.31	0.99 (VHF-cetacean)	0.06 (VHF-cetacean)
4	MODU Drilling with OSV under DP (8 hours)	5.22	1.07 (LF-cetacean)	0.13 (VHF-cetacean)
5	OSV on Standby with ROV Cutting	3.06	0.31 (VHF-cetacean)	0.03 (VHF-cetacean)

Noise exposure criteria: [a] NOAA (2024) and [b] NMFS (2024).
A dash indicates the level was not reached within the limits of the modelled resolution (20 m).

Vessel and Drilling Modelling – Sea Turtles

The threshold criteria from Finneran et al. (2017) were used to assess TTS and PTS for sea turtles. Across all scenarios, the maximum distances to threshold were 220 m for TTS and less than the modelling resolution (20 m) for PTS. The maximum distance to the SEL_{24h} metrics for TTS and PTS onset for sea turtles (Finneran et al. 2017) are outlined in Table 2. As is the case with marine mammals, a reported radius for SEL_{24h} criteria does not mean that sea turtles travelling within this radius of the source will be injured, but rather that an animal could be exposed to the sound level associated with either TTS or PTS if it remained in that location for 24 hours.

Table 2: Summary of sea turtle results: Summary of horizontal distances (in km) to turtle behavioural response criteria, temporary threshold shift (TTS), and permanent threshold shift (PTS).

Hearing group	Frequency–weighted SEL_{24h} threshold ($L_{E,24h}$; dB re 1 µPa²·s)	Scenario 1:		Scenario 2:		Scenario 3:		Scenario 4:		Scenario 5:	
		R_{max} (km)	Area (km²)	R_{max} (km)	Area (km²)	R_{max} (km)	Area (km²)	R_{max} (km)	Area (km²)	R_{max} (km)	Area (km²)
PTS											
Sea turtles	220	–	–	–	–	–	–	–	–	–	–
TTS											
Sea turtles	200	0.22	0.15	–	–	–	–	–	–	–	–

A dash indicates the level was not reached within the limits of the modelled resolution (20 m).

Vessel and Drilling Modelling – Fish

This modelling study assessed the ranges for quantitative criteria based on Popper et al. (2014) and considered SPL metrics associated with recoverable injury and TTS, as appropriate for non-impulsive noise. Table 3 summarises the maximum distances to effect criteria for fish.

Table 3: Summary of fish results: Maximum (R_{max}) horizontal distances (in km), from all scenarios considered, to sound pressure level (SPL) criteria based on Popper et al. (2014).

SPL (L_p; dB re 1 µPa)	Scenario 1:		Scenario 2:		Scenario 3:		Scenario 4:		Scenario 5:	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
Recoverable injury (48 h)[1]	–	–	–	–	–	–	–	–	–	–
TTS (12 h)[2]	0.08	0.08	–	–	–	–	–	–	–	–

[1] 48 h threshold for recoverable injury for fish with a swim bladder involved in hearing (Popper et al. 2014).
[2] 12 h threshold for TTS for fish with a swim bladder involved in hearing (Popper et al. 2014).
A dash indicates the level was not reached within the limits of the modelled resolution (20 m).

Vertical Seismic Profiling

In addition to vessel and drilling noise modelling, the modelling study also considered Vertical Seismic Profiling (VSP) at the well centre with a maximum of 300 impulses over a 24 hour period. The VSP location was centred at the Judith-2 well location be representative of the range of water depths around the exploration area.

As VSP is an impulsive noise source, the noise effect criteria are different to those in the vessel and drilling scenarios.

Vertical Seismic Profiling – *Marine Mammals:*

This modelling study applied the criteria from NMFS 2024, which requires two metrics (PK and SEL_{24h}) to be considered when assessing marine mammal TTS and PTS, with the longest distance associated with either metric being required to be applied. Table 4 summarises the maximum distances for TTS and PTS, along with the relevant metric associated with the maximum distance for the VSP results. The maximum distance where the NOAA (2024) marine mammal behavioural response criterion of 160 dB re 1 µPa (SPL) is also presented in Table 4.

Table 4. Summary of maximum (R_{max}) horizontal distances (in km) from any modelled site to behavioural response thresholds and temporary threshold shift (TTS) and permanent threshold shift (PTS) for marine mammals.

Hearing group	Modelled distance to effect threshold (R_{max} km)				
	Behavioural response [a]	Impairment: TTS [b,c]	Impairment: PTS [b,c]	Impairment: TTS [b,d]	Impairment: PTS [b,d]
Low–frequency (LF) cetaceans	2.82	4.82	0.85	–	–
High–frequency (HF) cetaceans		0.03	–	–	–
Very high–frequency (VHF) cetaceans		0.16	–	0.28	0.07

Noise exposure criteria: [a] NOAA (2024) and [b] NMFS (2024)
[c] Longest distance to threshold from SEL_{24h} results, with 300 impulses
[d] Longest distance to threshold from PK results
A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

Vertical Seismic Profiling – *Sea turtles:*

- The PK sea turtle criteria of 226 dB re 1 µPa for TTS and 232 dB re 1 µPa for PTS from Finneran et al. (2017) were not exceeded at a distance longer than 20 m from the acoustic centre of the source.
- The maximum distances to the SEL_{24h} metrics for TTS and PTS (Finneran et al. 2017) of 189 dB re 1 μPa^2s for TTS and 204 dB re 1 μPa^2s for PTS was 0.53 km for TTS onset and 0.05 km for PTS onset for the 600 in^3 seismic source with the 300 shots configuration (summarised in Table 5). As is the case with marine mammals, a reported radius for SEL_{24h} criteria does not mean that sea turtles travelling within this radius of the source will be injured, but rather that an animal could be exposed to the sound level associated with either TTS or PTS if it remained in that location for 24 hours.
- The maximum distances to the behavioural response criteria for sea turtles of 166 dB re 1 µPa (SPL) and the 175 dB re 1 µPa (SPL) threshold for behavioural disturbance (McCauley et al. 2000) were 1.74 km and 0.54 km, respectively for the 600 in^3 seismic source (summarised in Table 5).

Table 5. Summary of maximum horizontal distances (in km) from any modelled site to behavioural response thresholds and temporary threshold shift (TTS) and permanent threshold shift (PTS) for marine turtles.

Hearing group	Behavioural response[1]	Behavioural disturbance[1]	Impairment: TTS[2]	Impairment: PTS[2]
Sea Turtles	1.74 (SPL)	0.54 (SPL)	0.53 (SEL_{24h})	0.05 (SEL_{24h})

Noise exposure criteria: [1] McCauley et al. (2000), and [2] Finneran et al. (2017)

Vertical Seismic Profiling – *Fish, fish eggs, and fish larvae:*

This modelling study assessed the ranges for quantitative criteria based on Popper et al. (2014) and considered both PK and SEL_{24h} metrics associated with mortality and potential mortal injury as well as impairment in the following groups:

- Fish without a swim bladder (also appropriate for sharks in the absence of other information),
- Fish with a swim bladder that do not use it for hearing,
- Fish that use their swim bladders for hearing, and
- Fish eggs and fish larvae.

Table 6 summarises the maximum distances to effect criteria for fish, fish eggs, and fish larvae along with the relevant metric.

Table 6. Summary of maximum fish, fish eggs, and larvae injury and temporary threshold shift (TTS) onset distances for any modelled site, for single impulse and 24 h sound exposure level (SEL_{24h}) modelled scenarios.

Relevant hearing group	Effect criteria	Water column	
		Metric associated with longest distance to criteria	R_{max} (km)
Fish: No swim bladder	Recoverable injury	–	–
	TTS	SEL_{24h}	1.07
Fish: Swim bladder not involved in hearing and Swim bladder involved in hearing	Recoverable injury	SEL_{24h}	0.06
	TTS	SEL_{24h}	1.07
Fish eggs, and larvae	Injury	SEL_{24h}	0.02
Fish	TTS	PK	0.05

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

Vertical Seismic Profiling – *Benthic invertebrates:*

To assist with assessing the potential effects on crustaceans from VSP operations, the following results were determined:

- The sound level of 202 dB re 1 µPa PK–PK from Payne et al. (2008), which is representative of no effects, was considered for seafloor sound levels; the sound level was reached at 184 m from the acoustic centre of the VSP array.
- Sound levels of 209 – 212 dB re 1 µPa PK–PK from Day et al. (2016b) and 213 dB re 1 µPa from Day et al. (2016a), which are related to impairment in crustaceans, were considered; the levels reached for a receiver 5 cm above the seafloor are shown in Table 7.

Table 7: Maximum (R_{max}) horizontal distances (in m) from the seismic source to modelled seafloor (receiver located 5 cm above seafloor) peak–peak pressure levels (PK–PK) within the modelling area. Results included in relation to benthic invertebrates.

PK–PK (L_{pk-pk}; dB re 1 µPa)	Distance R_{max} (m)
	Receiver Depth: 66.65 m
213[1,2,3]	*
212[2,3]	19
210[1,2]	51
209[1,2]	64
202[4]	184

[1] Day et al. (2019), lobster
[2] Day et al. (2016a), lobster and scallops
[3] Day et al. (2017), scallops.
[4] Payne et al. (2008), lobster

2D Seismic Surveying

In addition to vessel and drilling noise and VSP modelling, the modelling study also considered seismic surveying with a towed array surveying within a 1 km^2 area with a maximum of 495 shots over a 24–hour period.

As the seismic source considered for the 2D shallow hazards seismic survey is an impulsive noise source, the noise effect criteria are the same as those applied with regard to the VSP modelling scenario.

2D Seismic Survey – *Marine Mammals:*

The results for marine mammal injury applied the criteria from NMFS 2024, which requires two metrics (PK and SEL_{24h}) to be considered when assessing marine mammal TTS and PTS, with the longest distance associated with either metric being required to be applied. Table 8 summarises the maximum distances for TTS and PTS, along with the relevant metric associated with the maximum distance for the seismic survey results. The maximum distance where the NOAA (2024) marine mammal behavioural response criterion of 160 dB re 1 µPa (SPL) is also presented in Table 8.

Table 8. Summary of maximum (R_{max}) horizontal distances (in km) from any modelled site to behavioural response thresholds and temporary threshold shift (TTS) and permanent threshold shift (PTS) for marine mammals.

Hearing group	Modelled distance to effect threshold (R_{max} km)				
	Behavioural response [a]	Impairment: TTS [b,c]	Impairment: PTS [b,c]	Impairment: TTS [b,d]	Impairment: PTS [b,d]
Low–frequency (LF) cetaceans	1.48	2.00	0.04	–	–
High–frequency (HF) cetaceans		–	–	–	–
Very high–frequency (VHF) cetaceans		–	–	0.05	0.03

Noise exposure criteria: [a] NOAA (2024) and [b] NMFS (2024)
[c] Longest distance to threshold from SEL_{24h} results
[d] Longest distance to threshold from PK results
A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

2D Seismic Survey – *Sea Turtles:*

- The PK sea turtle criteria of 226 dB re 1 µPa for TTS and 232 dB re 1 µPa for PTS from Finneran et al. (2017) were not exceeded at a distance longer than 20 m from the acoustic centre of the source.
- The maximum distances to the SEL_{24h} metrics for TTS and PTS (Finneran et al. 2017) of 189 dB re 1 μPa^2s for TTS and 204 dB re 1 μPa^2s for PTS were less than the modelling resolution of 20 m for the 160 in^3 seismic source; therefore it is likely that the 2D seismic survey will exceed PTS and TTS thresholds only within 20 m distance of the source, if at all.
- The maximum distances to the behavioural response criteria for sea turtles of 166 dB re 1 µPa (SPL) and the 175 dB re 1 µPa (SPL) threshold for behavioural disturbance (McCauley et al. 2000) were 0.17 km and 0.07 km, respectively for the 160 in^3 seismic source (summarised in Table 5).

Table 9. Summary of maximum horizontal distances (in km) from any modelled site to behavioural response thresholds and temporary threshold shift (TTS) and permanent threshold shift (PTS) for marine turtles.

Hearing group	Behavioural response[1]	Behavioural disturbance[1]
Sea Turtles	0.17 (SPL)	0.07 (SPL)

Noise exposure criteria: [1] McCauley et al. (2000).

2D Seismic Survey – *Fish, fish eggs, and fish larvae:*

This modelling study assessed the ranges for quantitative criteria based on Popper et al. (2014) and considered both PK and SEL_{24h} metrics associated with mortality and potential mortal injury as well as impairment (recoverable injury and TTS) in the following groups:

- Fish without a swim bladder (also appropriate for sharks in the absence of other information),
- Fish with a swim bladder that do not use it for hearing,
- Fish that use their swim bladders for hearing, and
- Fish eggs and fish larvae.

Table 10 summarises the maximum distances to effect criteria for fish, fish eggs, and fish larvae along with the relevant metric. The PK metric thresholds for fish were not exceed in this modelling.

Table 10. Summary of maximum fish, fish eggs, and larvae injury and temporary threshold shift (TTS) onset distances for any modelled site, for single impulse and 24 h sound exposure level (SEL_{24h}) modelled scenarios.

Relevant hearing group	Effect criteria	Water column	
		Metric associated with longest distance to criteria	R_{max} (km)
Fish: No swim bladder	Recoverable injury	–	–
	TTS	SEL_{24h}	0.10
Fish: Swim bladder not involved in hearing and Swim bladder involved in hearing	Recoverable injury	SEL_{24h}	–
	TTS	SEL_{24h}	0.10
Fish eggs, and larvae	Injury	SEL_{24h}	–

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

2D Seismic Survey – *Benthic invertebrates:*

To assist with assessing the potential effects on crustaceans from surveying operations, the following results were determined:

- The sound level of 202 dB re 1 µPa PK–PK from Payne et al. (2008), which is representative of no effects, was considered for seafloor sound levels; the sound level was reached at 3.55 m (Table 11).
- Sound levels of 209–212dB re 1 µPa PK–PK from Day et al. (2016b) and 213 dB re 1 µPa from Day et al. (2016a), which are related to impairment in crustaceans, were considered; these levels were not reached for a receiver 5 cm above the seafloor (Table 11).

Table 11. Maximum (R_{max}) horizontal distances (in m) from the seismic source to modelled seafloor (receiver located 5 cm above seafloor) peak–peak pressure levels (PK–PK) within the modelling area. Results included in relation to benthic invertebrates.

PK–PK (L_{pk-pk}; dB re 1 µPa)	Distance R_{max} (m)
	Receiver Depth: 66.65 m
213[1,2,3]	*
212[2,3]	*
210[1,2]	*
209[1,2]	*
202[4]	3.55

[1] Day et al. (2019), lobster
[2] Day et al. (2016a), lobster and scallops
[3] Day et al. (2017), scallops.
[4] Payne et al. (2008), lobster
An asterisk indicates that the sound level was not reached.

1. Introduction

JASCO Applied Sciences (JASCO) performed a modelling study of underwater sound levels associated with Emperor Energy's Judith-2 exploratory drilling campaign activities and operations. The considered noise generating activities include drilling and vessel operations, vertical seismic profiling (VSP) and a 2D seismic survey for shallow water hazard identification. This study can be used to assist in understanding the potential acoustic impact on key regional receptors including marine mammals, sea turtles, and fish. The modelling study predicted the distances from operations at which underwater sound levels reached noise effect thresholds and criteria. The marine mammal thresholds include levels associated with behavioural response, temporary threshold shift (TTS), and permanent threshold shift (PTS). The marine mammal functional hearing groups considered were low–, high–, very high–frequency cetaceans, and Otariid seals.

Estimated underwater acoustic levels associated with the drilling and vessel activities and operations are presented as sound pressure levels (SPL, L_p), and accumulated sound exposure levels (over 24 hours) (SEL_{24h}, $L_{E,24h}$), as appropriate for non–impulsive (continuous) noise sources. Estimated underwater acoustic levels associated with the VSP and the 2D seismic survey operations are presented as sound pressure levels (SPL, L_p), zero–to–peak pressure levels (PK, L_{pk}), peak–to–peak pressure levels (PK–PK; L_{pk-pk}), and either single–impulse (i.e., per–pulse) or accumulated sound exposure levels (SEL, L_E) as appropriate for different noise effect criteria. Complementary underwater acoustic propagation models were used in conjunction with the source models or source levels to estimate sound levels considering site–specific environmental influences. Sound fields were predicted for individual sources, and accumulated sound exposure fields were predicted for the representative scenarios considering an assessment period of 24 hours. A conservative sound speed profile that would be most supportive of sound propagation conditions for the potential operational period was defined and applied within the parameterisation of the models.

For the VSP modelling, this study considered a seismic source with a total volume of 600 in^3, fixed at 5 m depth. For the 2D shallow hazard survey scenario, this study considered a single airgun with a total volume 160 in^3, towed at 7 m depth at 8 knots. JASCO's specialised Airgun Array Source Model (AASM) was used to predict the acoustic signature and spectra for each seismic source. AASM accounts for individual airgun volumes, airgun bubble interactions, and array geometry to yield accurate source predictions. The modelling methodology considered source directivity and range–dependent environmental properties. Estimated underwater acoustic levels associated with VSP scenarios are presented as SEL_{24h}, for multiple pulses (5, 10, 25, 50, 100, 150, 200, 250, 300) over a 24 hour period.

This report is further structured as follows, the remainder of Section 1 provides details on the scenarios considered for modelling, Section 2 explains the metrics used to represent underwater acoustic fields and the effect criteria considered for both non-impulsive and impulsive noise sources. Section 3 details the methodology for predicting the source levels and modelling the sound propagation, including the specifications of the considered sound sources and the environmental parameters. Section 4 presents the acoustic results as tabulated ranges to thresholds and sound level contour maps. Modelling results are then discussed in Section 5.

1.1. Modelling Scenarios – Vessels and Drilling

This study considered the following vessel and drilling activities:

- Vessel noise from two Anchor Handling Tug Supply (AHTS) vessels on slow transit to represent pre-lay activities, and an AHTS under dynamic positioning (DP) during anchor hookup operations. All AHTS were modelled within the vicinity of the well site location,
- Drilling noise from an anchored Mobile Offshore Drilling Unit (MODU),

- Vessel noise from the Offshore Supply Vessels (OSV) on slow transit in standby operation, modelled as following a random track in a 2x4 km box approximately 2 km east of the MODU,
- Noise from an OSV under DP during cargo resupply operations (for 8 hours),
- Noise from an ROV undertaking cutting operations occurring at the seafloor near the MODU.

Tables 12 and 13 outline the modelling locations and scenarios.

Table 12. Modelled site locations and source information.

Site	Source/Vessel Description	Latitude (°S)	Longitude (°E)	MGA[1] Zone 55		Water depth (m)
				X (m)	Y (m)	
1	AHTS (Transit)	38°08'32.31"	148°30'59.26"	636896	57773587	66.7
2	AHTS (Transit)	38°08'28.92"	148°33'43.70"	632898	5777318	66.7
3	AHTS (Anchor Hook–up, DP)	38°08'47.61"	148°32'22.46"	634901	5776821	66.7
4	Anchored MODU (Drilling)	38°08'30.87"	148°32'21.8"	634897	5777320	66.7
5	OSV (Transit)	38°08'29.7131"	148°33'46.8094"	636967	5777321	72.8
6	OSV (Resupply, DP)	38°08'30.7983"	148°32'24.6740"	634967.3	5777321	66.9
7	ROV Ops	38°08'30.87"	148°32'21.8"	636967	5777321	66.7

[1]Map Grid of Australia (MGA)

Table 13. Description of modelled scenarios.

Scenario	Site(s)	Operation Name	Operation Description	Operation Time
1	1,2,3	Prelay and Anchor Setup	2 x AHTS (Transit) + 1 AHTS (Anchor Hook–up, DP)	24 hr
2	4	MODU Drilling	MODU Drilling	24 hr
3	4, 5	MODU Drilling + OSV Standby	MODU Drilling + OSV Standby	24 hr
4	4,6	MODU Drilling + OSV Resupply	MODU Drilling + OSV (Resupply, DP)	Drilling 24 hr Resupply 8 hr
5	5,7	OSV (Transit) + ROV Operations	OSV Standby + ROV Ops	24 hr

Figure 1 displays an overview of the vessel and drilling operation modelling area showing modelling locations, Biologically Important Areas (BIAs) for southern right whales (*Eubalaena australis*) and pygmy blue whales (*Balaenoptera musculus brevicauda*), and the regional bathymetry.

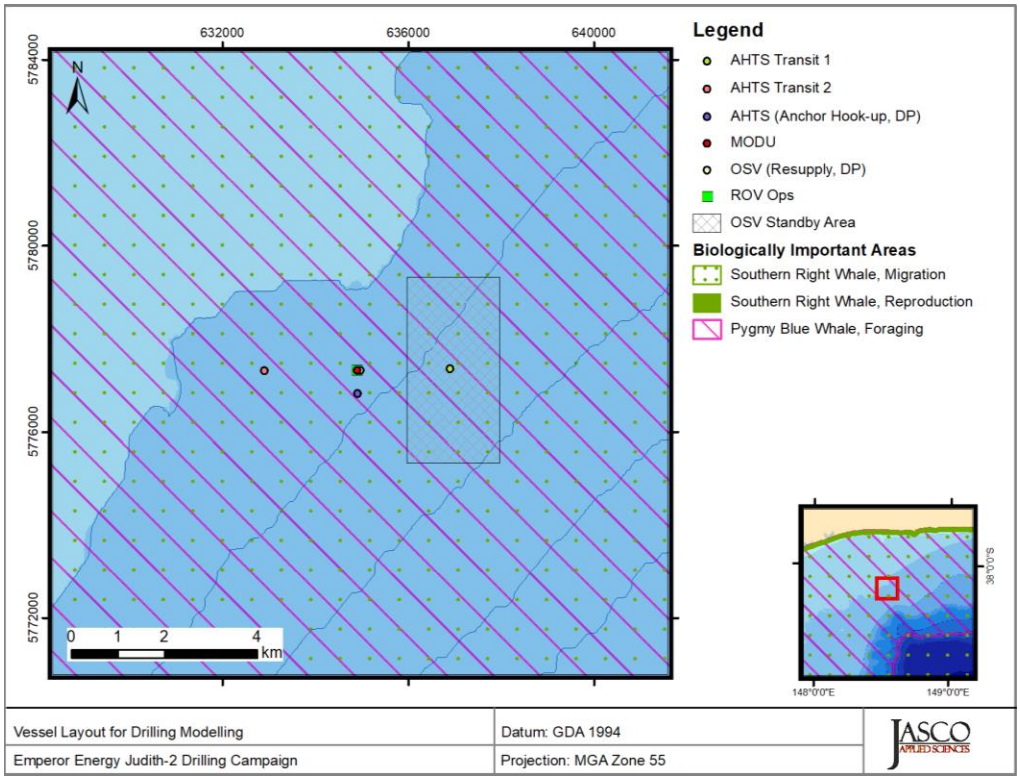


Figure 1: Overview map of drilling modelling sites

1.2. Modelling Scenarios – VSP

For VSP modelling, one site was modelled considering a 600 in^3 seismic source. The modelling assumed that a VSP is stationed at the centre of the well site, we understand the VSP source will be operated and lowered into the water via crane from the MODU. A total of 5, 10, 25, 50, 100, 150, 200, 250, and 300 impulses were considered independently to inform the assessment of different operational configurations over a 24-hour period. The location of the modelled site is provided in Table 16, and the acquisition scenarios are detailed in Table 17, with the considered site shown in Figure 2.

Table 14. Location details for the single impulse modelled sites.

Site	Latitude (S)	Longitude (E)	MGA[1] Zone 55		Water depth (m)
			X (m)	Y (m)	
8	38°08'30.87"	148°32'21.8"	634897	5777320	66.7

[1] Map Grid of Australia (MGA)

Table 15. Parameters for modelled scenarios.

Scenario	Source volume (in^3)	Tow depth (m)	Number of Shots
1	600	5	5
			10
			25
			50
			100
			150
			200
			250
			300

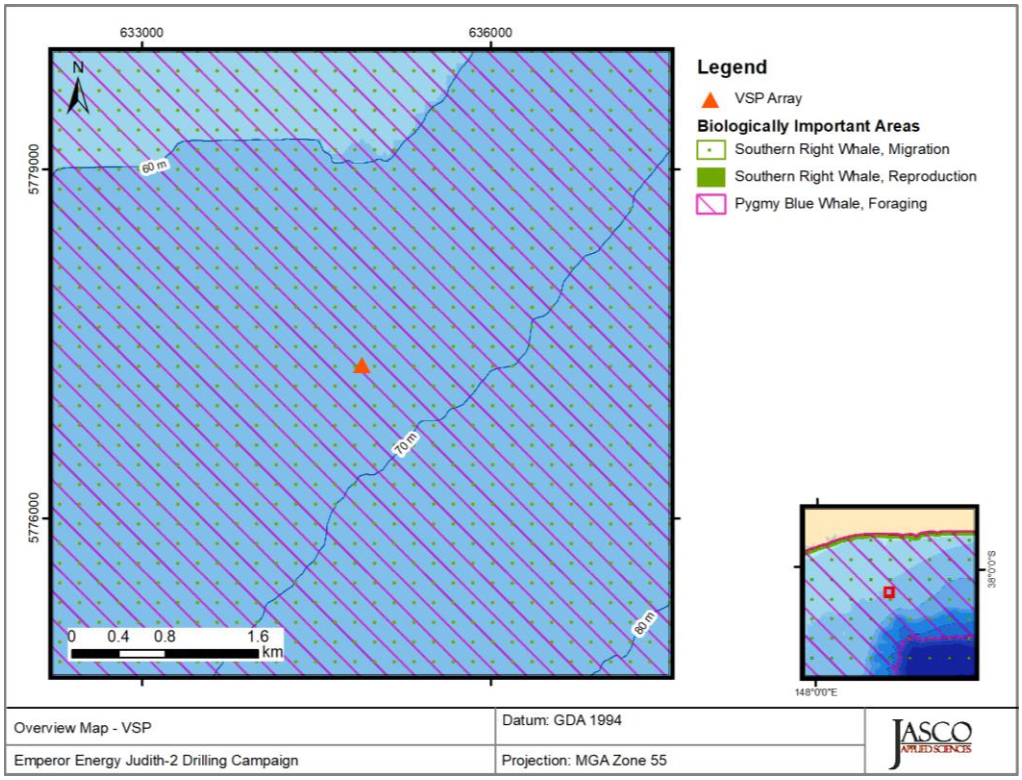


Figure 2. Overview map of VSP site.

1.3. Modelling Scenarios – 2D Shallow Hazards Seismic Survey

For the shallow hazards seismic survey, one 24–hour acquisition scenario was modelled considering a single 160 in^3 seismic source. The location of the modelled site (located at the well site) is provided in Table 16, and the acquisition scenario (termed Scenario 1) is detailed in Table 17. The acquisition pattern considered is presented in Figure 3. The acquisition pattern and lines were derived from the best available data provided by the client at the time of this study. The model parameterisation considered that a survey vessel sailed along survey lines at 8 knots, towing one 160 in^3 source, with an impulse interval (inter–pulse interval) of 22.2 m and a line separation of 100 m. For modelling purposes, the seismic source was assumed not to operate during line turns. Scenario 1 accounted for 495 impulses during the 24–hour acquisition scenario.

Table 16. Location details for the single impulse modelled sites.

Site	Latitude (S)	Longitude (E)	MGA[1] Zone 55		Water depth (m)
			X (m)	Y (m)	
9	38°08'30.87''	148°32'21.8''	634897	5777320	66.7

[1] Map Grid of Australia (MGA)

Table 17. Parameters for modelled scenarios.

Scenario	Source volume (in^3)	Tow depth (m)	Tow direction (°)	Impulse interval (m)	Discharged impulses
1	160	7	0/180	22.2	495

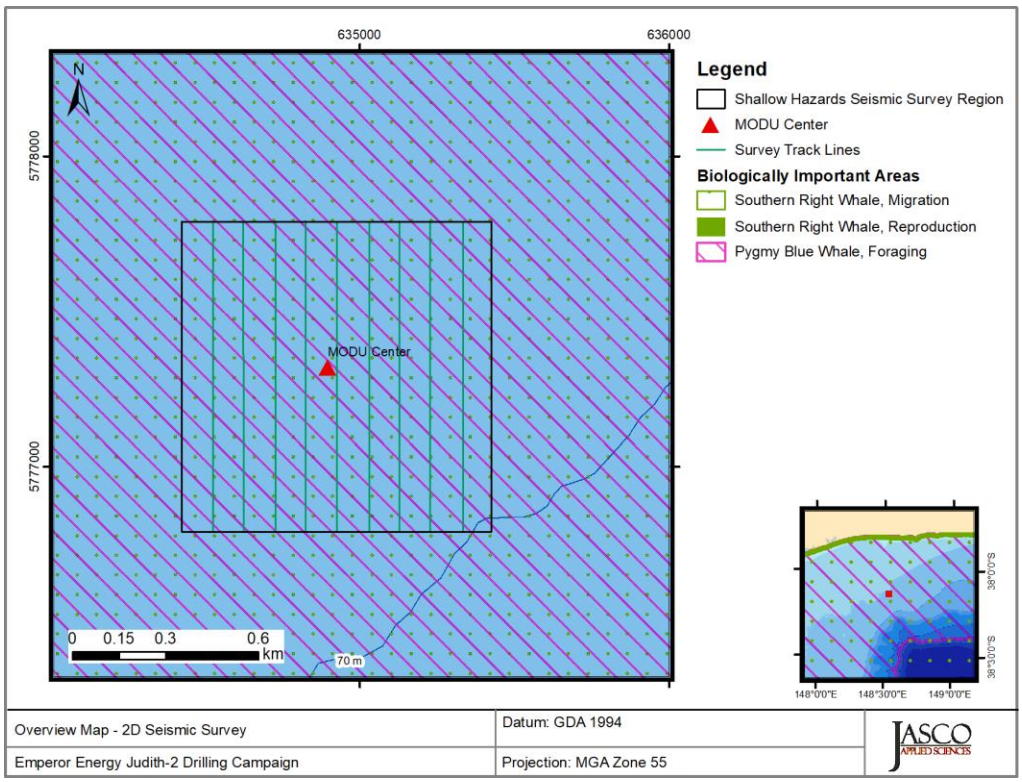


Figure 3. Overview map of 2D shallow hazards seismic survey modelled site and acquisition scenario.

2. Noise Effect Criteria

To assess the potential effects of a sound–producing activity, it is necessary to first establish exposure criteria (thresholds) for which sound levels may be expected to have an adverse effect on animals. Whether acoustic levels might injure or disturb marine fauna is an active research topic. Since 2007, several expert groups have developed SEL–based assessment approaches for evaluating auditory injury, with key works including Southall et al. (2007b), Finneran and Jenkins (2012), Popper et al. (2014), United States National Marine Fisheries Service (NMFS 2018), Southall et al. (2019) and NMFS (2024). The number of studies that investigate the level of behavioural disturbance to marine fauna by anthropogenic sound has also increased substantially.

The perceived loudness of sound, especially impulsive noise such as from seismic survey or VSP, is not generally proportional to the instantaneous acoustic pressure. Rather, perceived loudness depends on the pulse rise–time and duration, and the frequency content. Several sound level metrics, such as PK, SPL, and SEL, are commonly used to evaluate noise and its effects on marine life (Appendix A.3). The period of accumulation associated with SEL is defined, with this report referencing either a "per–pulse" assessment or over 24 h. For non–impulsive sound sources, such as vessels, SPL and SEL are the relevant metrics. The acoustic metrics in this report reflect the ISO standard for acoustic terminology, ISO/DIS 18405:2017 (2017).

The following thresholds and guidelines for this study were chosen because they represent the best available science, and sound levels presented in literature for fauna with no defined thresholds:

1. Marine Mammals:
    a. Peak pressure levels (PK; L_{pk}) and frequency–weighted accumulated sound exposure levels (SEL; $L_{E,24h}$) from NMFS (2024) for the onset of permanent threshold shift (PTS) and temporary threshold shift (TTS) in marine mammals for impulsive sources.
    b. Frequency–weighted accumulated sound exposure levels (SEL; $L_{E,24h}$) from NMFS (2024) for the onset of permanent threshold shift (PTS) and temporary threshold shift (TTS) in marine mammals for non–impulsive sound sources.
    c. Marine mammal behavioural thresholds based on the current interim U.S. National Oceanic and Atmospheric Administration (NOAA) (2024) unweighted criterion for marine mammals of 160 dB re 1 µPa (SPL; L_p) for impulsive sound sources and 120 dB re 1 µPa (SPL; L_p) for non–impulsive sound sources.
2. Fish, fish eggs, and larvae:
    a. Sound exposure guidelines for fish, fish eggs, and larvae (used as a surrogate for plankton) (Popper et al. 2014).
3. Sea turtles
    a. Frequency–weighted accumulated sound exposure levels (SEL; $L_{E,24h}$) from Finneran et al. (2017) for the onset of PTS and TTS in turtles for non–impulsive and impulsive sound sources.
    b. Sea turtle behavioural response threshold of 166 dB re 1 µPa (SPL; L_p) for impulsive noise, along with a sound level associated with behavioural disturbance 175 dB re 1 µPa (SPL; L_p) (McCauley et al. 2000).

The following sections (along with Appendices A.3 and A.4), expand on the thresholds, guidelines and sound levels for all marine fauna.

2.1. Non–impulsive Noise

Vessel, drilling and ROV operations have been assessed as non–impulsive noise sources consistent with the considered thresholds and guidelines below.

2.1.1. Marine Mammals

The NMFS (2024) criteria applied in this study to assess possible effects of non–impulsive noise sources on marine mammals are summarised in Table 18. Low, high and very-high frequency cetaceans, and Otariid seals were identified as the marine mammals requiring assessment. Details on thresholds related to auditory threshold shifts or hearing loss and behavioural response are provided in Appendix A.3, with frequency weighting explained in detail in Appendix A.4.

Table 18. Criteria for effects of non–impulsive noise exposure, including vessel noise, for marine mammals: unweighted SPL and weighted SEL_{24h} thresholds.

Hearing group	NOAA (2024)	NMFS (2024)	
	Behaviour	TTS onset thresholds (received level)	PTS onset thresholds (received level)
	SPL (L_p; dB re 1 µPa)	Weighted SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)	Weighted SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)
Low–frequency (LF) cetaceans	120	177	197
High–frequency (HF) cetaceans		181	201
Very High–frequency (VHF) cetaceans		161	181
Otariid seals		179	199

L_p denotes sound pressure level and has a reference value of 1 µPa.
L_E denotes cumulative sound exposure over a 24 h period and has a reference value of 1 µPa²·s.

2.1.1.1. Behavioural Response

The NOAA continuous noise criterion was selected for this assessment because it represents the most commonly applied behavioural response criterion by regulators. The distances at which behavioural responses could occur are therefore determined by areas ensonified above an unweighted SPL of 120 dB re 1 µPa (NMFS 2014, NOAA 2024). Appendix A.3 provides more information about the development of this criteria.

2.1.2. Injury and Hearing Sensitivity Changes

There are two categories of auditory threshold shifts or hearing loss: permanent threshold shift (PTS), a physical injury to an animal's hearing organs; and temporary threshold shift (TTS), a temporary reduction in an animal's hearing sensitivity as the result of receptor hair cells in the cochlea becoming fatigued.

To assist in assessing the potential for effect on marine mammals, this report applies the criteria recommended by NMFS (2024), considering both TTS and PTS (see Table 18). Appendix A.3 provides more information about the NMFS (2024) criteria.

2.1.3. Fish, Sea Turtles, Fish Eggs, and Fish Larvae

Table 19 lists the relevant effects thresholds from Popper et al. (2014) for shipping and continuous noise. Some evidence suggests that fish sensitive to acoustic pressure show a recoverable loss in hearing sensitivity, or injury when exposed to high levels of noise (Scholik and Yan 2002, Amoser and Ladich 2003, Smith et al. 2006); this is reflected in the SPL thresholds for fish with a swim bladder involved in hearing (shaded cells in Table 19). Finneran et al. (2017) presented revised thresholds for

sea turtle PTS and TTS onset from continuous noise sources, considering frequency weighted SEL, which have been applied in this study (Table 20).

Table 19. Criteria for vessel noise exposure for fish and sea turtles, adapted from Popper et al. (2014).

Type of animal	Mortality and Potential mortal injury	Impairment			Behaviour
		Recoverable injury	TTS	Masking	
Fish: No swim bladder (particle motion detection)	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Fish: Swim bladder not involved in hearing (particle motion detection)	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Fish: Swim bladder involved in hearing (primarily pressure detection)	(N) Low (I) Low (F) Low	170 dB SPL for 48 h	158 dB SPL for 12 h	(N) High (I) High (F) High	(N) High (I) Moderate (F) Low
Sea Turtles	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) High (I) Moderate (F) Low
Fish eggs and fish larvae	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) High (I) Moderate (F) Low	(N) Moderate (I) Moderate (F) Low

Sound pressure level dB re 1 µPa.
Relative risk (high, moderate, low) is given for animals at three distances from the source defined in relative terms as near (N) – tens of metres, intermediate (I) – hundreds of metres, and far (F) – thousands of metres.

Table 20. Acoustic effects of continuous noise on sea turtles, weighted SEL_{24h}, Finneran et al. (2017).

PTS onset thresholds (received level)	TTS onset thresholds (received level)
Weighted SEL_{24h} ($L_{E,24h}$; dB re 1 µPa^{2}s)	Weighted SEL_{24h} ($L_{E,24h}$; dB re 1 µPa^{2}s)
220	200

L_E denotes cumulative sound exposure over a 24 h period and has a reference value of 1 µPa^{2}s.

2.1. Impulsive Noise

VSP and seismic surveying activities have been assessed as impulsive noise sources consistent with the considered thresholds and guidelines.

2.1.1.1. Marine Mammals

The NMFS (2024) criteria applied in this study to assess possible effects of impulsive noise sources on marine mammals are summarised Table 21; cetaceans and seals were identified as the hearing group requiring assessment.

There are two categories of auditory threshold shifts or hearing loss: permanent threshold shift (PTS), a physical injury to an animal's hearing organs; and temporary threshold shift (TTS), a temporary reduction in an animal's hearing sensitivity as the result of receptor hair cells in the cochlea becoming fatigued. Details on thresholds related to auditory threshold shifts or hearing loss and behavioural

response are provided in Appendix A.3, with frequency weighting explained in detail in Appendix A.4. The behavioural response criteria from NOAA (2024) has been applied.

Table 21. Acoustic effects of impulsive noise on marine mammals: Unweighted SPL, SEL_{24h}, and PK thresholds.

Hearing group	NOAA (2024)	NMFS (2024)			
	Behaviour	TTS onset thresholds* (received level)		PTS onset thresholds* (received level)	
	SPL (L_p; dB re 1 µPa)	Weighted SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)	PK (L_{pk}; dB re 1 µPa)	Weighted SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)	PK (L_{pk}; dB re 1 µPa)
Low–Frequency (LF) cetaceans	160	168	216	183	222
High–frequency (HF) cetaceans		178	224	193	230
Very High–frequency (VHF) cetaceans		144	196	159	202
Otariid Seals		170	224	185	230

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating TTS or PTS onset.

L_p denotes sound pressure level and has a reference value of 1 µPa.

L_{pk} denotes peak sound pressure is flat weighted or unweighted and has a reference value of 1 µPa.

$L_{E,24h}$ denotes cumulative sound exposure over a 24 h period and has a reference value of 1 μPa^2s.

2.1.1.2. Fish, Fish Eggs, and Fish Larvae

In 2006, the Working Group on the Effects of Sound on Fish and Sea Turtles was formed to continue developing noise exposure criteria for fish and sea turtles, work begun by a NOAA panel two years earlier. The Working Group developed guidelines with specific thresholds for different levels of effects for several species groups (Popper et al. 2014). The guidelines define quantitative thresholds for three types of immediate effects:

- Mortality, including injury leading to death,
- Recoverable injury, including injuries unlikely to result in mortality, such as hair cell damage and minor haematoma, and
- TTS.

Masking and behavioural effects can be assessed qualitatively, by assessing relative risk rather than by specific sound level thresholds. However, as these depend upon activity–based subjective ranges, these effects are not addressed in this report and are included in Tables 22 for completeness only. Because the presence or absence of a swim bladder has a role in hearing, fish's susceptibility to injury from noise exposure depends on the species and the presence and possible role of a swim bladder in hearing. Thus, different thresholds were proposed for fish without a swim bladder (also appropriate for sharks), fish with a swim bladder not used for hearing, and fish that use their swim bladders for hearing. Sea turtles, fish eggs, and fish larvae are considered separately.

Impulsive noise from seismic activities are assessed in this study based on the relevant effects thresholds from Popper et al. (2014) listed in Table 22. In general, whether an impulsive sound adversely effects fish behaviour depends on the species, the state of the individual exposed, and other factors.

The SEL metric integrates noise intensity over some period of exposure. Because the period of integration for regulatory assessments is not well defined for sounds that do not have a clear start or end time, or for very long–lasting exposures, an exposure evaluation time must be defined. Southall et al. (2007b) defines the exposure evaluation time as the greater of 24 h or the duration of the activity. Popper et al. (2014) recommend a standard period of the duration of the activity; however, the publication also includes caveats about considering the actual exposure times if fish move. Popper et al. (2014) summarises that in all TTS studies considered, fish that showed TTS recovered to normal hearing levels within 18–24 hours. Due to this, a period of accumulation of 24 hours has been applied in this study for SEL, which is similar to that applied for marine mammals in NMFS (2016, 2018), Southall et al. (2019) and NMFS (2024).

Table 22. Criteria for seismic noise exposure for fish, adapted from Popper et al. (2014).

Type of animal	Mortality and Potential mortal injury	Impairment			Behaviour
		Recoverable injury	TTS	Masking	
Fish: No swim bladder (particle motion detection)	>219 dB SEL_{24h} or >213 dB PK	>216 dB SEL_{24h} or >213 dB PK	>>186 dB SEL_{24h}	(N) Low (I) Low (F) Low	(N) High (I) Moderate (F) Low
Fish: Swim bladder not involved in hearing (particle motion detection)	210 dB SEL_{24h} or >207 dB PK	203 dB SEL_{24h} or >207 dB PK	>>186 dB SEL_{24h}	(N) Low (I) Low (F) Low	(N) High (I) Moderate (F) Low
Fish: Swim bladder involved in hearing (primarily pressure detection)	207 dB SEL_{24h} or >207 dB PK	203 dB SEL_{24h} or >207 dB PK	186 dB SEL_{24h}	(N) Low (I) Low (F) Moderate	(N) High (I) High (F) Moderate
Fish eggs and fish larvae (relevant to plankton)	>210 dB SEL_{24h} or >207 dB PK	(N) Moderate (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low

Peak sound pressure level: dB re 1 µPa; SEL_{24h} dB re 1µPa^2·s.
All criteria are presented as sound pressure even for fish without swim bladders since no data for particle motion exist. Relative risk (high, moderate, low) is given for animals at three distances from the source defined in relative terms as near (N), intermediate (I), and far (F).

2.1.1.3. Sea Turtles

There is a paucity of data regarding responses of turtles to acoustic exposure, and no studies of hearing loss due to exposure to loud sounds. Popper et al. (2014) suggested thresholds for onset of mortal injury (including PTS) and mortality for sea turtles and, in absence of taxon–specific information, adopted the levels for fish that do not hear well (suggesting that this likely would be conservative for sea turtles).

Finneran et al. (2017) presented revised thresholds for sea turtle injury and hearing impairment (TTS and PTS). Their rationale is that sea turtles have best sensitivity at low frequencies and are known to have poor auditory sensitivity (Bartol and Ketten 2006, Dow Piniak et al. 2012). Accordingly, TTS and PTS thresholds for turtles are likely more similar to those of fishes than to marine mammals (Popper et al. 2014).

McCauley et al. (2000) observed the behavioural response of caged sea turtles—green (*Chelonia mydas*) and loggerhead (*Caretta caretta*)—to an approaching seismic airgun. For received levels above 166 dB re 1 µPa (SPL), the sea turtles increased their swimming activity, and above 175 dB re 1 µPa they began to behave erratically, which was interpreted as an agitated state. The

Recovery Plan for Marine Turtles in Australia (Department of the Environment and Energy et al. 2017) acknowledges the 166 dB re 1 µPa SPL reported (McCauley et al. 2000) as the level that may result in a behavioural response to marine turtles. The 175 dB re 1 µPa level from McCauley et al. (2000) is recommended as a criterion for behavioural disturbance; these thresholds are shown in Table 23.

Table 23. Acoustic effects of impulsive noise on sea turtles: Unweighted sound pressure level (SPL), 24–hour sound exposure level (SEL_{24h}), and peak pressure (PK) thresholds

Effect type	Criterion	SPL (L_p; dB re 1 µPa)	Weighted SEL_{24h} ($L_{E,24h}$; dB re 1 µPa^2·s)	PK (L_{pk}; dB re 1 µPa)
Behavioural response	McCauley et al. (2000)	166	NA	
Behavioural disturbance		175		
PTS onset thresholds[1] (received level)	Finneran et al. (2017)	NA	204	232
TTS onset thresholds[1] (received level)			189	226

[1] Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS and TTS onset.

L_p denotes sound pressure level and has a reference value of 1 µPa.

L_{pk} denotes peak sound pressure is flat weighted or unweighted and has a reference value of 1 µPa.

$L_{E,24h}$ denotes cumulative sound exposure over a 24 h period and has a reference value of 1 µPa^2s.

2.1.2. Benthic Invertebrates

Research is ongoing into the relationship between sound and its effects on crustaceans, including the relevant metrics for both effect and impact. Available literature suggests particle motion, rather than sound pressure, is a more important factor for crustacean and bivalve hearing. Water depth and seismic source size are related to the particle motion levels at the seafloor, with larger arrays and shallower water being related to higher particle motion levels, more likely relevant to effects on crustaceans and bivalves.

At the seafloor interface, crustaceans and bivalves are subject to particle motion stimuli from several acoustic or acoustically–induced waves. These include the particle motion associated with an impinging sound pressure wave in the water column (the incident, reflected, and transmitted portions), substrate acoustic waves, and interface waves of the Scholte type. However, it is unclear which aspect(s) of these waves is/are most relevant to the animals, either when they normally sense the environment or their physiological responses to loud sounds, so there is not enough information to establish similar criteria and thresholds as done for marine mammals and fish. Including recent research, such as Day et al. (2016b), current literature does not clearly define an appropriate metric or identify relevant levels (pressure or particle motion) for an assessment. This includes the consideration of what particle motion levels lead to a behavioural response, or mortality. Therefore, at this stage, we cannot propose authoritative thresholds to inform the impact assessment.

The pressure and acceleration examples provided in Day et al. (2016a) indicate that the acceleration and pressure signals occurred simultaneously, which was interpreted as an indication that the waterborne sounds were responsible for the accelerations measured by the geophones. For clarity, it is important to distinguish that the acceleration from waterborne sound energy is *not* ground roll, which Day et al. (2016a) correctly define as the sound that propagates along the interface at a speed lower than the shear wave speed of the sediment. However, the report subsequently uses ground roll for all further discussions of particle acceleration. While Day et al. (2016a) discuss that they chose the simplest measure of ground roll, it should have been referring to as ‘the acceleration from waterborne sound energy’, or ‘waterborne acceleration’ for short.

In consideration of the evolving research, for crustaceans a PK–PK sound level of 202 dB re 1 µPa (Payne et al. 2008) is considered to be associated with no effect. PK–PK sound levels exceeding

202 dB re 1 µPa are therefore assessed here. Additionally for context related to different levels of potential impairment, the PK–PK sound levels of 209–212 dB re 1 µPa determined by Day et al. (2016b) to affect crustaceans, and 213 dB re 1 µPa from Day et al. (2019), are also included.

For bivalves, PK–PK sound levels of 212, and 213 dB re 1 µPa are presented to allow comparison to the maximum sound levels measured in Day et al. (2016a) and Day et al. (2017) for scallops and pearl shell oyster at which behavioural and physiological effects occurred.

Particle acceleration from the seismic source is also considered here for comparing to the results in Table 7 of Day et al. (2016a), where the maximum particle acceleration assessed for scallops was 37.57 m/s^2.

3. Methods and Parameters

The modelled sites for the activities considered in this study were located around a well site location, indicative of the Judith-2 exploratory drilling program. The modelled sites were situated in water depths of approximately 67–73 m and are considered representative of Emperor Energy's operations within the operational area (refer to wide regional bathymetry in Appendix C.1.1).

To allow for operational flexibility, the sound speed profile implemented within the modelling was selected through a sensitivity analysis considering all months of the year. The month of June was found to be the most favourable for sound propagation, resulting in the largest ranges to considered isopleths criteria, due to the presence of a slightly upward refracting sound speed profile. As such, June was selected as the conservative choice for modelling. Additional detail can be found in Appendix C.1.2.

The seabed beneath the modelled sites will likely consist of coarse sand underlain by limestone. The geologic and geoacoustic profiles of the seabed were generated using borehole analysis from Holdgate et al. (2003) and Mitchell et al. (2007). Further details on the associated geoacoustic properties used in this modelling study are provided in Appendix C.1.3.

Section 3.1 provides a description of the inputs used for the vessel and drilling noise modelling study. The sections are divided into subsections detailing the source inputs for the vessels (Section 3.1.1) with Sections 3.1.2–3.1.3 providing details on the applied modelling techniques and model configuration information.

Section 3.2 provides a description of the inputs used for the VSP component of this study. The sections are divided into subsections detailing the acoustic source inputs for the airgun array (Section 3.2.1) with Sections 3.2.2 – 3.2.3 providing details on the applied modelling techniques and model configuration information.

Section 3.3 provides a description of the inputs used for the 2D shallow hazards seismic survey modelling component of this study. The sections are divided into subsections detailing the acoustic source inputs for the airgun source (Section 3.3.1) with Sections 3.3.2 – 3.3.3 providing details on the applied modelling techniques and model configuration information.

3.1. Vessels and Drilling

3.1.1. Noise Sources

Underwater sound that radiates from vessels is produced mainly by propeller and thruster cavitation, with a smaller fraction of noise produced by sound transmitted through the hull, such as by engines, gearing, and other mechanical systems. Sound levels tend to be the highest when thrusters are used to position the vessel and when the vessel is transiting at high speeds. A vessel's sound signature depends on the vessel's size, power output, propulsion system (e.g., conventional propellers vs. Voith Schneider propulsion), and the design characteristics of the given system (e.g., blade shape and size). A vessel produces broadband acoustic energy with most of the energy emitted below a few kilohertz. Sound from onboard machinery, particularly sound below 200 Hz, dominates the sound spectrum before cavitation begins (Spence et al. 2007).

Figure 4 presents a summary plot of all considered source spectra for comparison purposes. The source spectra plot shows the distribution of sound across the decidecade frequency bands that the modelling considers. Additional detail on the sources is provided in Sections 3.1.1.1 and 3.1.1.2.

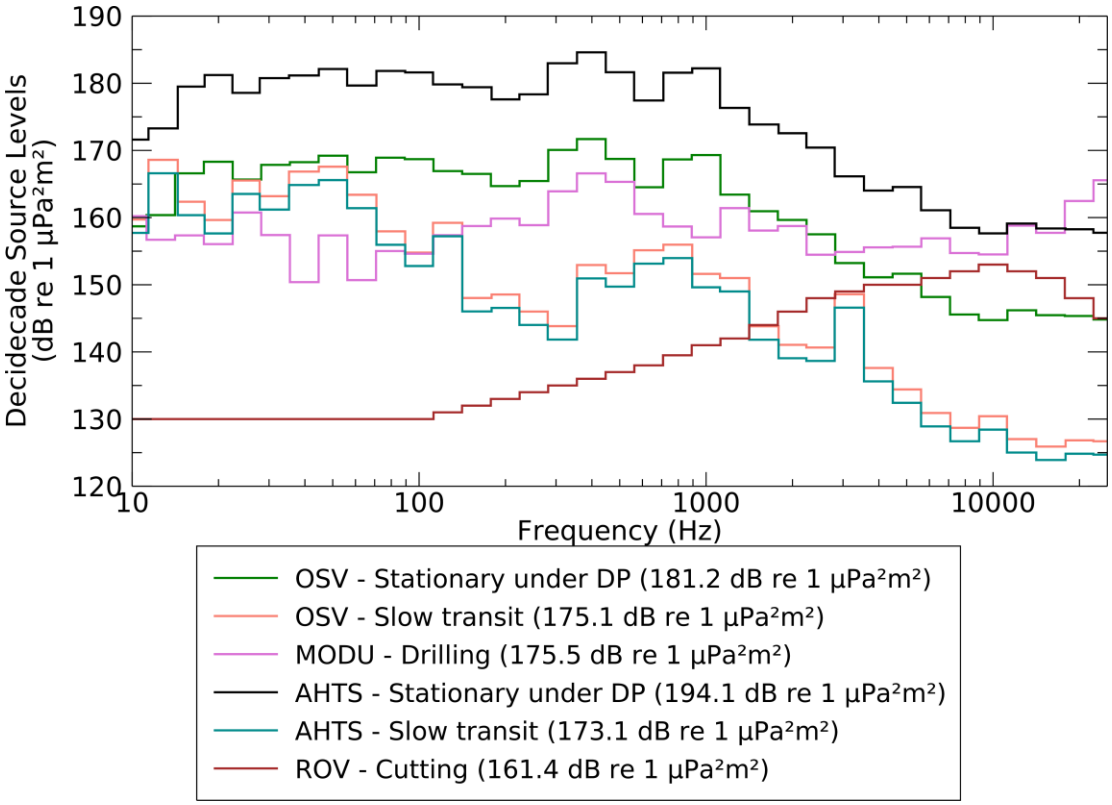


Figure 4. Monopole source level (MSL) spectra (in decidecade frequency–band) for all sound sources.

3.1.1.1. Mobile Offshore Drilling Unit (MODU)

The MODU, or semi–submersible platform, considered in this study is likely similar to the *Ocean Onyx*, (Figure 5). While in operation, it will be held in position via anchors and chains, as opposed to using thrusters. Underwater sound from the MODU while drilling is expected to originate primarily from onboard equipment vibrations, while a smaller portion of the sound is expected to be transmitted directly into the water via the rotating drill string (Austin et al. 2018a). Since the dominant vibration sources (e.g. pumps, generators, and machinery) are located on or below the main deck of the platform, the modelled depth of the point source representing the MODU was set to 11.6 m, which is approximately half the draft of the *Ocean Onyx*.

The Ocean Onyx (Figure 5) was measured by JASCO while anchored and drilling (McPherson et al. 2021), and had a broadband (10 Hz to 31 kHz) source level of 175.4 dB re 1 µPa m.

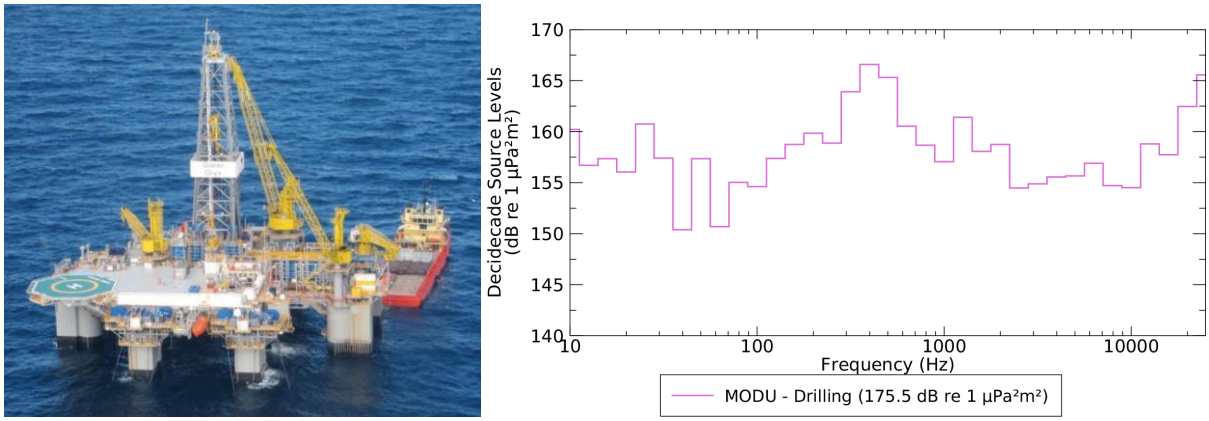


Figure 5. *Ocean Onyx* semi–submersible platform (left) and the source spectrum (right) (Photo source: Offshore Energy, 2020).

3.1.1.2. Vessel Radiated Noise

Underwater sound that radiates from vessels is produced mainly by propeller and thruster cavitation, with a smaller fraction of noise produced by sound transmitted through the hull, such as by engines, gearing, and other mechanical systems. Sound levels tend to be the highest when thrusters are used to position the vessel and when the vessel is transiting at high speeds. A vessel's sound signature depends on the vessel's size, power output, propulsion system (e.g., conventional propellers vs. Voith Schneider propulsion), and the design characteristics of the given system (e.g., blade shape and size). A vessel produces broadband acoustic energy with most of the energy emitted below a few kilohertz. Sound from onboard machinery, particularly sound below 200 Hz, dominates the sound spectrum before cavitation begins (Spence et al. 2007).

3.1.1.2.1. Anchor Handling Tug (AHT)

At this stage, the exact vessel specifications as well as the precise operational scenarios are not known. As such, estimates of the source levels for the Anchor Handling Tug Supply (AHTS) operations were based on a generic design AHTS vessel. The AHTS was based on the Siem VS491 CD design AHTS vessel and its specifications were used to form a basis for vessel source level estimation and source depth for acoustic modelling purposes. The general specification of these vessels is that they have a bollard pull of 285–310 t, and an overall length, beam, and draft of 91.0 m, 22.0 m and 7.95 m respectively.

The measured monopole source levels (MSLs) and spectra for the AHTS were taken from McPherson et al. (2021). For scenarios where the AHTS was under dynamic positioning (DP), the spectra from Section 5.5.2 in McPherson et al. (2021) were used.

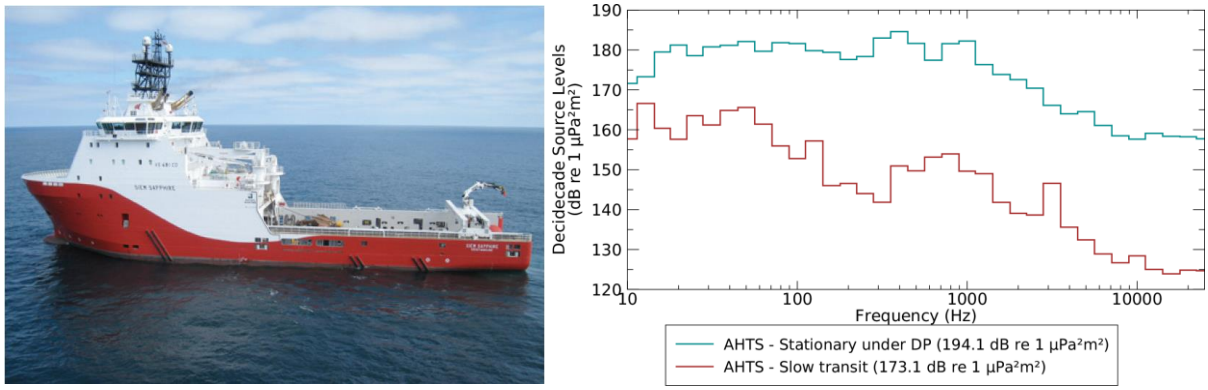


Figure 6. Photo of an Anchor Handling Tug Supply (AHTS) vessel (left) and the source spectra (right) (Photo source: Siem Offshore 2010).

3.1.1.2.2. Offshore Supply Vessel (OSV)

The vessel specifications for the OSV were based on the *MMA Leeuwin*, a platform supply vessel 82.2 m in length, 17 m in width, and a draft of 6.3 m. The *MMA Leeuwin* has a maximum installed thruster power of 4920 kW from two 1600 kW fixed pitch azimuth thrusters and two 880 kW controllable pitch tunnel thrusters. For the modelled scenarios in this study, the vessel was considered to be on stationary holding position whilst on DP for the resupply scenarios. For the operational scenario that included an OSV on standby, it was modelled as moving slowly (4 knots) in a defined area (refer to Section 1.1 to review scenario particulars).

The broadband (10 Hz to 25 kHz) source level of the *MMA Leeuwin* under DP has been measured to be 181.2 dB re 1 µPa^{2}m^2 and while on standby is 181.3 dB re 1 µPa^{2}m^2 (Esso 2021). Measurements for the transiting *MMA Leeuwin* from (Esso 2021) where recorded at a vessel speed of 8.8 knots, to

achieve the source level for a 4 knots speed, the overall level was scaled down using the recommended speed scaling factor for tugs (the most similar vessel category to the *MMA Leeuwin*) by MacGillivray and Li (2018) to 175.1 dB re 1 μPa^{2}m^2.

A nominal spectral shape of the *MMA Leeuwin* was selected based on the *Siem Sapphire* measured on DP and standby transit (McPherson et al. 2021); this shape was adjusted to match the broadband levels discussed above.

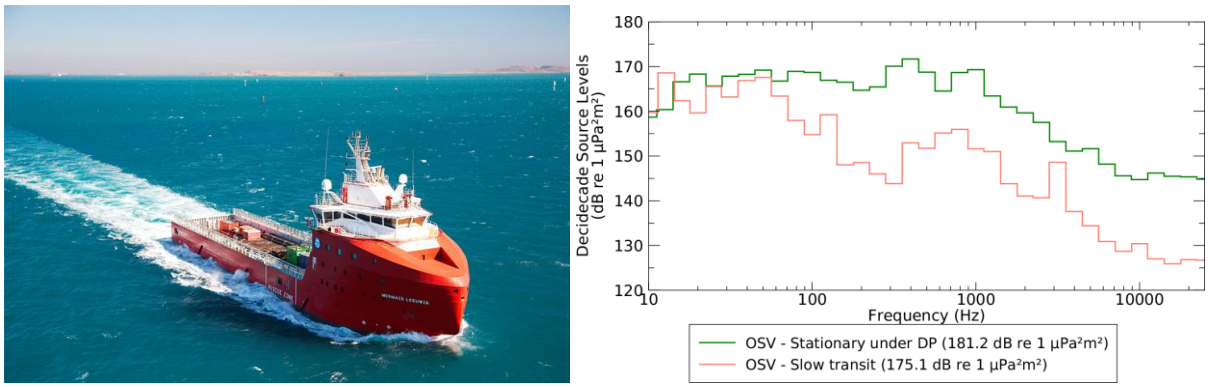


Figure 7. Photo of an Offshore Supply Vessel (OSV) (left) and the source spectra (right) (Photo source: MMA Offshore, 2024).

3.1.1.2.3. ROV

At the time of this underwater noise study, the exact types of activities to be performed by an ROV were unknown. A typical noise–generating activity involving an ROV was assumed to inform the assessment of operations involving an ROV. Nominal ROV cutting activities were considered representative of such operations, with the cutting tool likely to be similar to a diamond wire saw. The available literature, both published and grey, quantifying underwater sound fields generated by diamond wire saws or similar cutting technologies is very limited.

Pangerc et al. (2016) described the underwater sound measurement data during an underwater diamond wire cutting of a 32” conductor (10 m above seabed in approximately 80 m depth) and found that at lower frequencies, the operation was generally indistinguishable above the background noise; however, the sound that could be associated with the diamond wire cutting was primarily detectable above the background noise at the higher acoustic frequencies (above around 5 kHz). The background noise levels were substantially higher at lower frequencies, while it is likely that the spectra of the noise from the cutter peaks at higher frequencies, which has been approximated between 2.5 and 20 kHz.

In another study, the US Navy measured underwater sound levels when the diamond saw was cutting caissons for replacing piles at an old fuel pier at Naval Base Point Loma and reported an average SPL for a single cutter at 136.1–141.4 dB re 1 μPa at 10 m, as reported in Fairweather Science (2018).

In the absence of other information, the information provided in Pangerc et al. (2016) was used to estimate a representative decidecade–band spectra for the diamond wire saw underwater, which was then scaled to have a level of 141.4 dB re 1 μPa at 10 m and then backpropagated using spherical spreading ($20\,log_{10}(R)$) to determine an energy source level (ESL) spectra (in decidecade frequency–band), yielding a broadband level of 161.4 dB re 1 μPa·m.

Figure 8 shows the representative decidecade–band ESL and the legend indicates the broadband ESL for the cutter used in this modelling work.

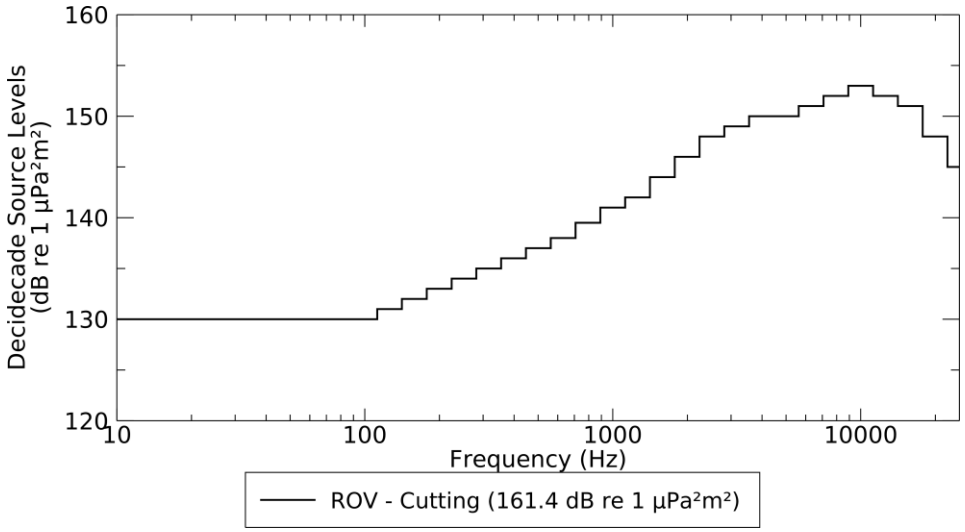


Figure 8. Energy source level (ESL) spectra (in decidecade frequency–band) for the diamond wire saw cutter.

3.1.2. Geometry and Modelled Regions

JASCO's Marine Operations Noise Model (MONM–BELLHOP; see Appendix C.2.2) was used to predict the acoustic field at frequencies of 10 Hz to 25 kHz for all vessels. To supplement the MONM results (10 Hz to 1 kHz), high–frequency results for propagation loss were modelled using BELLHOP (Porter and Liu 1994a) for frequencies from 1.26 to 25 kHz. The MONM and BELLHOP results were combined to produce results for the full frequency range of interest.

The sound field modelling calculated propagation losses up to 100 km from the source, with a horizontal separation of 20 m between receiver points along the modelled radials. The sound fields were modelled with a horizontal angular resolution of $\Delta\theta$ = 2.5° for a total of N = 144 radial planes. Receiver depths were chosen to span the entire water column over the modelled areas, from 2 m to a maximum of 4000 m.

To produce the maps of received sound level isopleths, and to calculate distances to specified sound level thresholds, the maximum–over–depth level was calculated at each sampling point within the modelled region. The radial grids of maximum–over–depth levels were then resampled (by linear triangulation) to produce a regular Cartesian grid. The contours and threshold ranges were calculated from these grids of the modelled acoustic fields.

3.1.3. Accumulated SEL

In the vessel scenarios, the sound sources were considered to be continuously operating with new sound energy constantly being introduced to the environment. The reported source levels are usually in terms of sound pressure levels (SPL), representing the average instantaneous acoustic level of a considered source. The evaluation of the cumulative sound field (i.e., in terms of SEL_{24h}) depends on the number of seconds of operation during the accumulation period.

The SPL modelling results were converted to SEL by the duration of the measurement, which is appropriate for a non–impulsive noise source. Here, SEL for the OSV under DP was assessed over 8 h, the duration of its operations, and the SEL for all other sites was assessed over 24 h. For a stationary vessel, the conversion from SPL was obtained by increasing the levels by $10*\log_{10}(T)$, where T is 86,400 (the number of seconds in 24 h). For scenarios where a vessel was transiting along a track, a similar adjustment to the SPL was applied, however the time factor was determined based on the step size along the track and the vessel's speed. See Appendix C.6 for details.

3.2. Vertical Seismic Profiling

3.2.1. Acoustic Source Model

The pressure signature of the individual airguns and the composite decidecade bands point–source equivalent directional levels (i.e., source levels) of the seismic source were modelled with JASCO's Airgun Array Source Model (AASM). Although AASM accounts for notional pressure signatures of each seismic source with respect to the effects of surface–reflected signals on bubble oscillations and inter–bubble interactions, the surface–reflected signal (known as surface ghost) is not included in the far–field source signatures. The acoustic propagation models account for those surface reflections, which are a property of the propagating medium rather than the source.

AASM considers:

- Array layout.
- Volume, tow depth, and firing pressure of each airgun.
- Interactions between different airguns in the array.

The seismic source was modelled over AASM's full frequency range, up to 25 kHz. Appendix B.1 details this model.

3.2.2. Sound Propagation Models

Three sound propagation models were used to predict the acoustic field around the seismic source:

- Combined range–dependent parabolic equation and Gaussian beam acoustic ray–trace model (MONM–BELLHOP, 10 Hz to 25 kHz).
- Full Waveform Range–dependent Acoustic Model (FWRAM, 10 to 1024 Hz).
- Wavenumber integration model (VSTACK,10 to 1024 Hz).

The models were used in combination to characterise the acoustic fields at short and long ranges in terms of SEL, SPL, PK, and PK–PK. Appendix C.2 provides further detailed information about each model.

MONM–BELLHOP was used to calculate SEL of a 360° area around each source location. FWRAM was used to model synthetic seismic pulses and to calculate water column PK and PK–PK levels. FWRAM was also used to generate a generalised SEL to SPL conversion function for the considered modelled sites. The conversion function was applied to predicted per–pulse SEL results from MONM–BELLHOP to estimate SPL values.

VSTACK was used to calculate close range PK and PK–PK levels along transects at the seafloor for the endfire and broadside directions for the VSP array and the 2D shallow hazards seismic survey.

3.2.2.1. Geometry and Modelled Regions

To assess sound levels with MONM–BELLHOP, the sound field modelling calculated propagation losses up to distances of 100 km from the source in each cardinal direction, with a horizontal separation of 20 m between receiver points along the modelled radials. The sound fields were modelled with a horizontal angular resolution of $\Delta\theta = 2.5°$ for a total of N = 144 radial planes. The single–impulse sound fields were modelled within a 100 × 100 km box area. Receiver depths were chosen to span the entire water column, from 2 m to a maximum of 150 m, with step sizes that increased with depth. To supplement the MONM results, high–frequency propagation loss was

modelled using BELLHOP for frequencies from 1.25 to 25 kHz. The MONM and BELLHOP results were combined to produce results for the full frequency range of interest.

FWRAM was run to 100 km with a 20 m receiver range step, which increases with distance from the source along four radials (fore and aft endfire, and port and starboard broadside). This was done to compute SEL–to–SPL conversions (Appendix C.5) but also to quantify water column PK levels.

The maximum modelled range for VSTACK was 1000 m, and a variable receiver range increment that increased away from the source was used, which increased from 10 to 25 m. Received levels were computed for receiver depths at 5 m and 5 cm above the seafloor.

3.2.3. Accumulated SEL

For the VSP sound source considered in this study, some criteria are based on the per–pulse energy released, others, such as the marine mammal and fish SEL criteria used in this report (Section 2), account for the total acoustic energy marine fauna is subjected to over a specified duration. The duration is defined in this report as 24 hours. An accurate assessment of the accumulated sound energy depends not only on the parameters of each VSP impulse but also on the number of impulses delivered in a duration.

For the VSP source, SEL accumulated over 24 h and for a stationary source was obtained by increasing the levels by $10*\log_{10}(N)$, where N is the number of shots within a 24 h period. This study considered 5, 10, 25, 50, 100, 150, 200, 250, 300 of impulses independently.

To produce maps of accumulated received sound level distributions and calculate distances to specified sound level thresholds, the maximum–over–depth and seafloor levels were calculated at each sampling point within the modelled region. The radial grids of maximum–over–depth sound levels for each impulse were then resampled (by linear triangulation) to produce a regular Cartesian grid. The sound field grids from all impulses were summed (see Equation A–5) to produce the cumulative sound field grid with cell sizes of 20 m. The contours and threshold ranges were calculated from these flat Cartesian projections of the modelled acoustic fields.

The unweighted (fish) and frequency–weighted SEL_{24h} results were rendered as contour maps, including contours that focus on the relevant criteria–based thresholds. Only contours at ranges larger than the nearfield of the VSP source were rendered.

3.3. 2D Shallow Hazards Seismic Survey

3.3.1. Acoustic Source Model

The 2D Shallow seismic source were modelled with JASCO's Airgun Array Source Model (AASM). The characteristics of AASM are specified in Section 3.2.1. The 2D seismic source was modelled over AASM's full frequency range, up to 25 kHz. Appendix C.3 details this model.

3.3.2. Sound Propagation Models

The three sound propagation models used to predict the acoustic field around the seismic sources were described in Section 3.2.2.

VSTACK was used to calculate close range PK and PK–PK levels along transects at the seafloor for the endfire and broadside directions for the VSP array and the 2D shallow hazards seismic survey.

3.3.2.1. Geometry and Modelled Regions

To assess sound levels with MONM–BELLHOP, the sound field modelling calculated propagation losses up to distances of 100 km from the source in each cardinal direction, with a horizontal separation of 20 m between receiver points along the modelled radials. The sound fields were modelled with a horizontal angular resolution of $\Delta\theta$ = 2.5° for a total of N = 144 radial planes. The single–impulse sound fields were modelled within a 100 × 100 km box area. Receiver depths were chosen to span the entire water column, from 2 m to a maximum of 150 m, with step sizes that increased with depth. To supplement the MONM results, high–frequency propagation loss was modelled using BELLHOP for frequencies from 1.25 to 25 kHz. The MONM and BELLHOP results were combined to produce results for the full frequency range of interest.

FWRAM was run to 100 km with a 20 m receiver range step, which increases with distance from the source along four radials (fore and aft endfire, and port and starboard broadside). This was done to compute SEL–to–SPL conversions (Appendix C.5) but also to quantify water column PK levels.

The maximum modelled range for VSTACK was 1000 m, and a variable receiver range increment that increased away from the source was used, which increased from 10 to 25 m. Received levels were computed for receiver depths at 5 m and 5 cm above the seafloor.

3.3.3. Accumulated SEL

During a seismic survey, new sound energy is introduced into the environment with each pulse from the seismic source. While some impact criteria are based on the per–pulse energy released, others, such as the marine mammal and fish SEL criteria used in this report (Section 2), account for the total acoustic energy marine fauna is subjected to over a specified duration. The duration is defined in this report as 24 hours. An accurate assessment of the accumulated sound energy depends not only on the parameters of each seismic impulse but also on the number of impulses delivered in a duration and the relative positions of the impulses.

When there are many seismic impulses, it becomes computationally prohibitive to perform sound propagation modelling for every single event. When the distance between the consecutive seismic impulses is small enough, such that the environmental parameters that influence sound propagation are virtually the same for many impulse points, the acoustic fields can be modelled for a subset of seismic pulses and estimated at several adjacent ones. After sound fields from representative impulse locations are calculated, they are adjusted to account for the source position for nearby impulses.

Estimating the cumulative sound field with the described approach is not as precise as modelling sound propagation at every impulse location. Nonetheless, small–scale, site–specific sound propagation features tend to blur and become less relevant when sound fields from adjacent impulses are summed. Larger scale sound propagation features, primarily dependent on water depth, dominate the cumulative field. The accuracy of the present method acceptably reflects those large–scale features, thus providing a meaningful estimate of a wide area SEL field in a computationally feasible framework.

To produce maps of accumulated received sound level distributions and calculate distances to specified sound level thresholds, the maximum–over–depth and seafloor levels were calculated at each sampling point within the modelled region. The radial grids of maximum–over–depth and seafloor sound levels for each impulse were then resampled (by linear triangulation) to produce a regular Cartesian grid. The sound field grids from all impulses were summed (see Equation A–5) to produce the cumulative sound field grid with cell sizes of 20 m. The contours and threshold ranges were calculated from these flat Cartesian projections of the modelled acoustic fields.

The unweighted (fish) and frequency–weighted SEL_{24h} results were rendered as contour maps, including contours that focus on the relevant criteria–based thresholds. Only contours at ranges larger than the nearfield of the seismic source were rendered.

4. Results

4.1. Results for Vessel and Drilling Modelling

The maximum–over–depth sound fields for the modelled scenarios are presented below in two formats: as tables of distances to sound levels and, where the distances are long enough, as contour maps showing the directivity and range to various sound levels.

For the results below, the distances to isopleths/thresholds were reported from either the centroid of several sources or from the most dominant single source. When an isopleth completely envelopes multiple sources the centroid was used. When several closed isopleths exist the most dominant source was used. Maps are provided in Section 4.1.2 to assist with contextualising tabulated distances.

4.1.1. Tabulated Results

Table 24 presents the maximum and 95% horizontal distances to specific SPL contours. The SPL sound footprints represent instantaneous sound fields and do not depend on time accumulation. Table 25 presents the maximum distances to frequency–weighted SEL_{24h} thresholds, as well as total ensonified areas.

Table 24. *SPL*: Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) to sound pressure level (SPL) from most appropriate location for considered sources per scenario. Scenario descriptions are provided in Table 12.

SPL (L_p; dB re 1 µPa)	Scenario 1 (2xAHTS Transit + 1 AHTS DP)		Scenario 2 (MODU Drilling)		Scenario 3 (MODU Drilling + OSV Transit)		Scenario 4 (MODU Drilling + OSV DP)		Scenario 5 (ROV Cutting + OSV Transit)	
	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)	R_{max} (km)	$R_{95\%}$ (km)
180	–	–	–	–	–	–	–	–	–	–
170[1]	–	–	–	–	–	–	–	–	–	–
160	0.07	0.06	–	–	–	–	–	–	–	–
158[2]	0.08	0.08	–	–	–	–	–	–	–	–
150	0.42	0.39	0.02	0.02	1.03	1.03	0.09	0.09	–	–
140	2.11	1.73	0.07	0.07	1.10	1.09	0.30	0.26	2.10	2.10
130	7.20	6.06	0.44	0.41	1.46	1.37	1.40	1.32	2.82	2.24
120[3]	23.7	18.8	2.24	2.11	3.31	2.93	5.22	4.76	3.06	2.88
110	72.6	61.2	8.85	7.88	9.79	8.51	19.1	15.8	5.22	4.68

[1] 48 h threshold for recoverable injury for fish with a swim bladder involved in hearing (Popper et al. 2014).
[2] 12 h threshold for TTS for fish with a swim bladder involved in hearing (Popper et al. 2014).
[3] Threshold for marine mammal behavioural response to non–impulsive noise (NOAA Fisheries 2024).
A dash indicates the level was not reached within the limits of the modelled resolution (20 m).

Table 25. *SEL_{24h}:* Maximum (R_{max}) horizontal distances (in km) to frequency–weighted SEL_{24h} PTS and TTS thresholds based on NMFS (2024) and Finneran et al. (2017) from most appropriate location for considered sources per scenario, along with ensonified area (km^2).

Hearing group	Frequency–weighted SEL_{24h} threshold ($L_{E,24h}$; dB re 1 µPa²·s)	Scenario 1 (2x AHTS + 1 AHTS DP)		Scenario 2 (MODU Drilling)		Scenario 3 (MODU Drilling + OSV Transit)		Scenario 4 (MODU Drilling + OSV DP)		Scenario 5 (ROV Cutting + OSV Transit)	
		R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)	R_{max} (km)	Area (km^2)
PTS											
LF cetaceans	197	0.44	0.55	0.03	0.00	0.03	0.00	0.09	0.01	–	–
HF cetaceans	201	0.04	0.00	–	–	–	–	–	–	–	–
VHF cetaceans	181	0.06	0.01	0.06	0.01	0.06	0.01	0.13	0.01	0.03	0.00
Sea turtles	220	–	–	–	–	–	–	–	–	–	–
Otariid seals	199	0.03	0.00	–	–	–	–	–	–	–	–
TTS											
LF cetaceans	177	8.20	157.8	0.53	0.82	0.63	0.84	1.07	3.19	0.05	0.01
HF cetaceans	181	0.92	1.81	0.08	0.02	0.08	0.02	0.16	0.03	0.03	0.00
VHF cetaceans	161	0.98	2.84	0.99	3.06	0.99	3.06	1.06	3.08	0.31	0.28
Sea turtles	200	0.22	0.15	–	–	–	–	–	–	–	–
Otariid seals	179	0.86	1.10	0.08	0.02	0.08	0.02	0.16	0.03	0.04	0.00

A dash indicates the level was not reached within the limits of the modelled resolution (20 m).

4.1.2. Sound Field Maps

Maps of the estimated sound fields, threshold contours, and isopleths of interest for SPL and SEL_{24h} sound fields are presented for the modelled scenarios.

4.1.2.1. SPL Sound Level Contour Maps

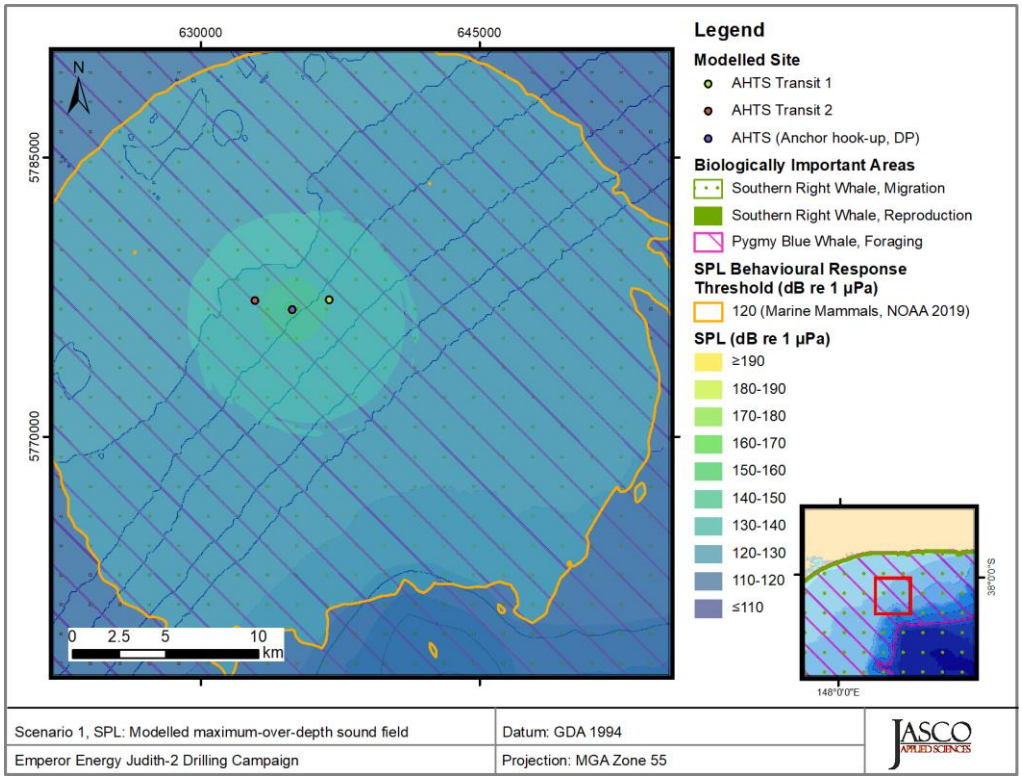


Figure 9. *Scenario 1: 2 AHTS Transit for Prelay + 1 AHTS DP for Anchor Hookup, SPL*: Sound level contour map showing the unweighted maximum–over–depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

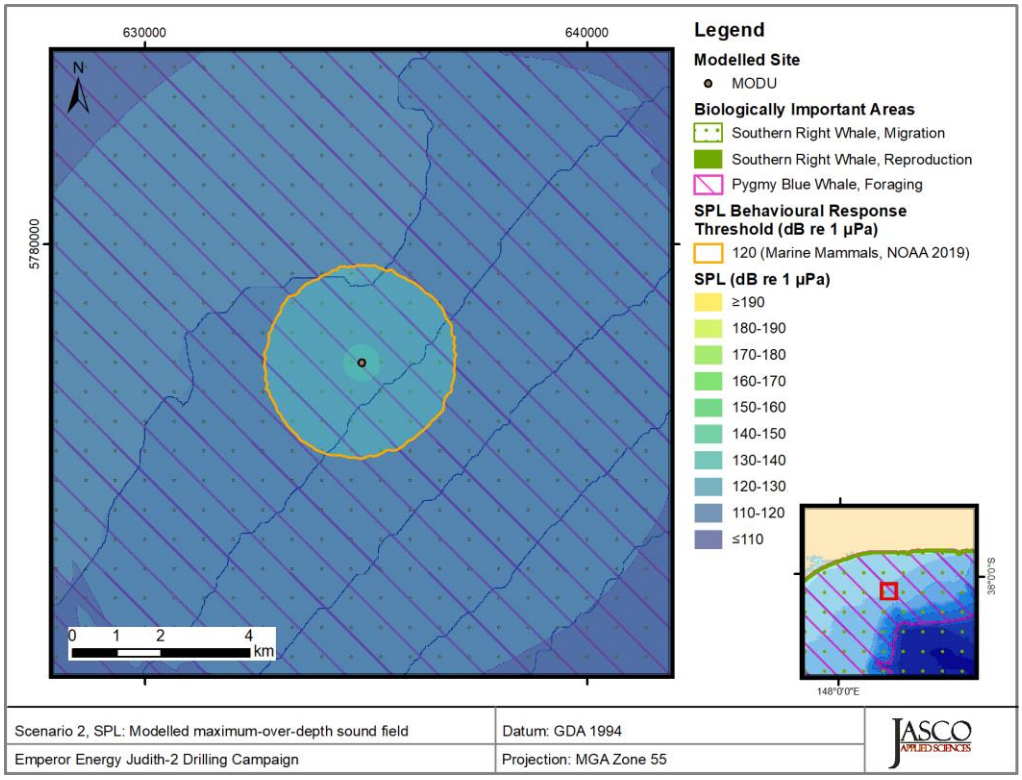


Figure 10. *Scenario 2: MODU Drilling, SPL*: Sound level contour map showing the unweighted maximum–over–depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

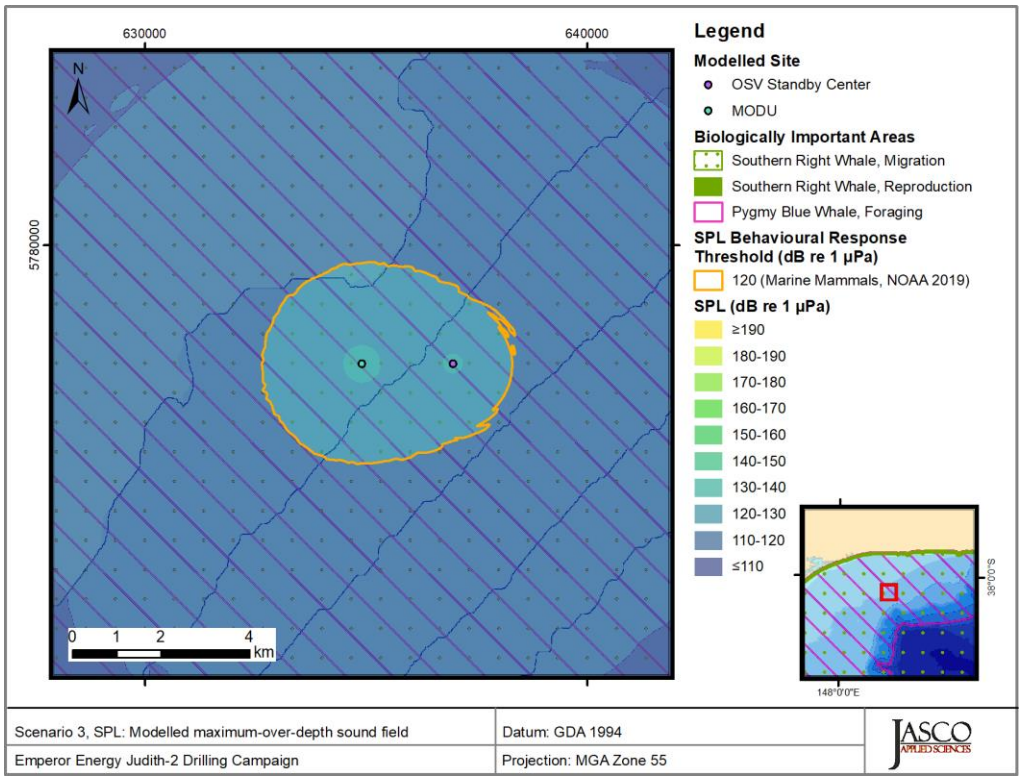


Figure 11. *Scenario 3: MODU Drilling + OSV Transit, SPL*: Sound level contour map showing the unweighted maximum–over–depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

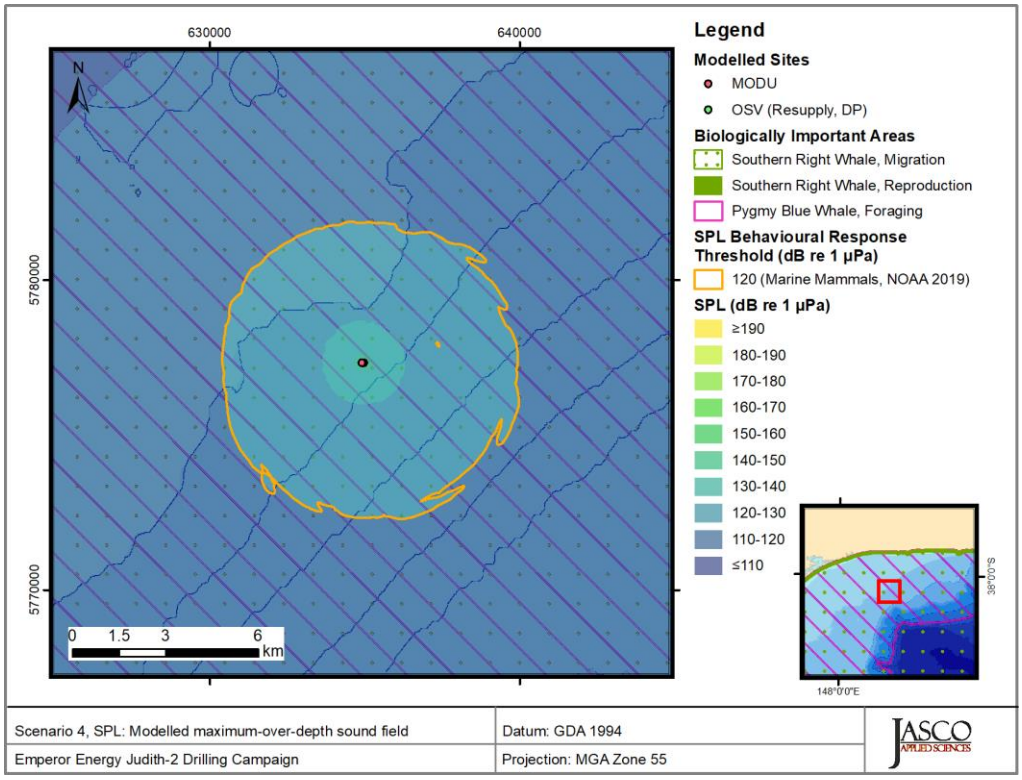


Figure 12. *Scenario 4: MODU Drilling + OSV under DP, SPL*: Sound level contour map showing the unweighted maximum–over–depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

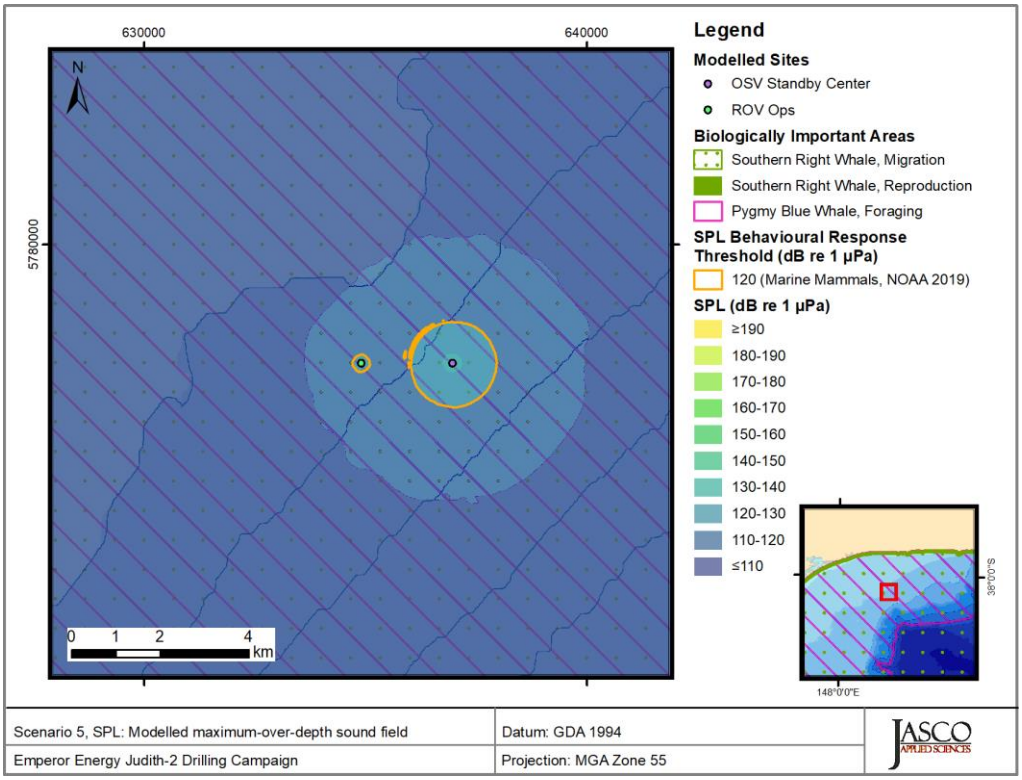


Figure 13. *Scenario 5: ROV Cutting + OSV Transit, SPL*: Sound level contour map showing the unweighted maximum–over–depth sound field in 10 dB steps, and the isopleths for behavioural response threshold for marine mammals.

4.1.2.2. Accumulated SEL_{24h} Sound level Contour Maps

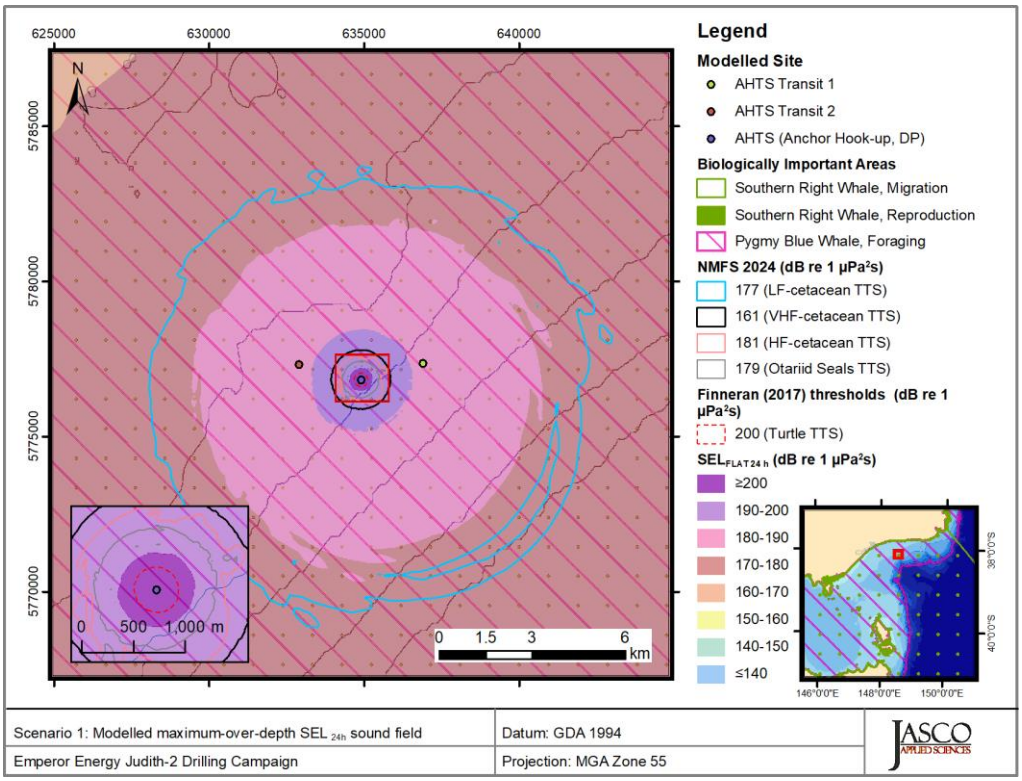


Figure 14. *Scenario 1: 2 AHTS Transit for Prelay + 1 AHTS DP for Anchor hookup*: Sound level contour map showing maximum–over–depth SEL_{24h} results (unweighted/flat), along with frequency weighted isopleths for TTS in low, high, very high–frequency cetaceans, otariid seals and turtles. Thresholds omitted here were not reached or not long enough to display graphically.

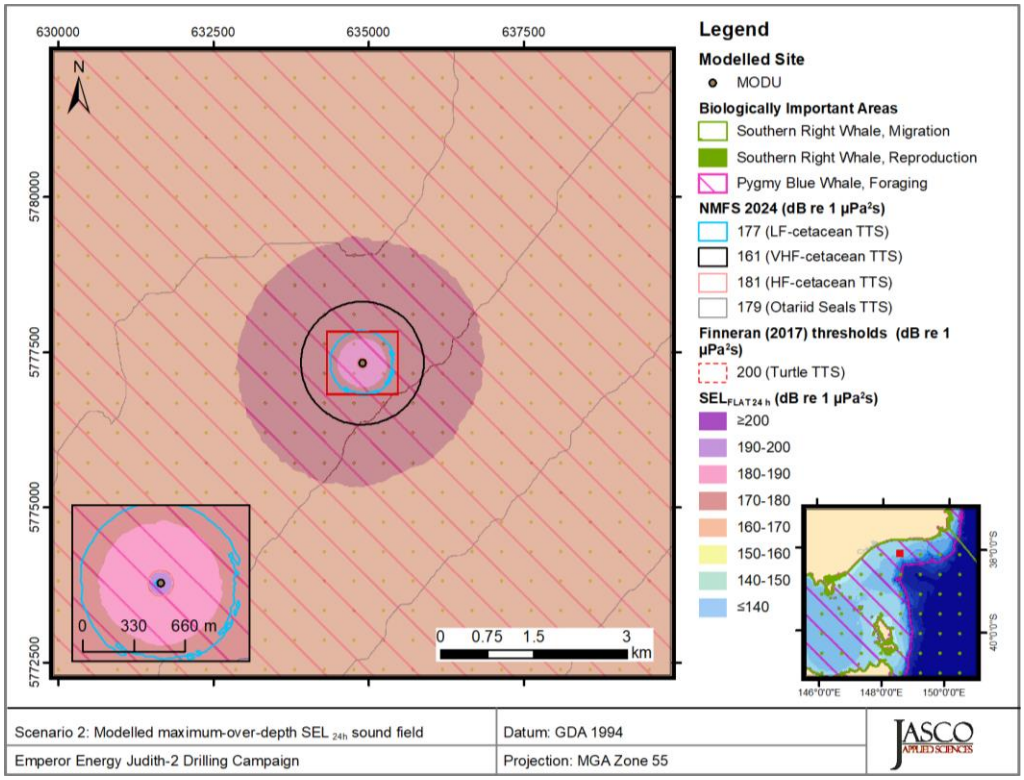


Figure 15. *Scenario 2: MODU Drilling*: Sound level contour map showing maximum–over–depth SEL_{24h} results (unweighted/flat), along with frequency weighted isopleths for TTS in low, high, very high–frequency cetaceans, otariid seals and turtles. Thresholds omitted here were not reached or not long enough to display graphically.

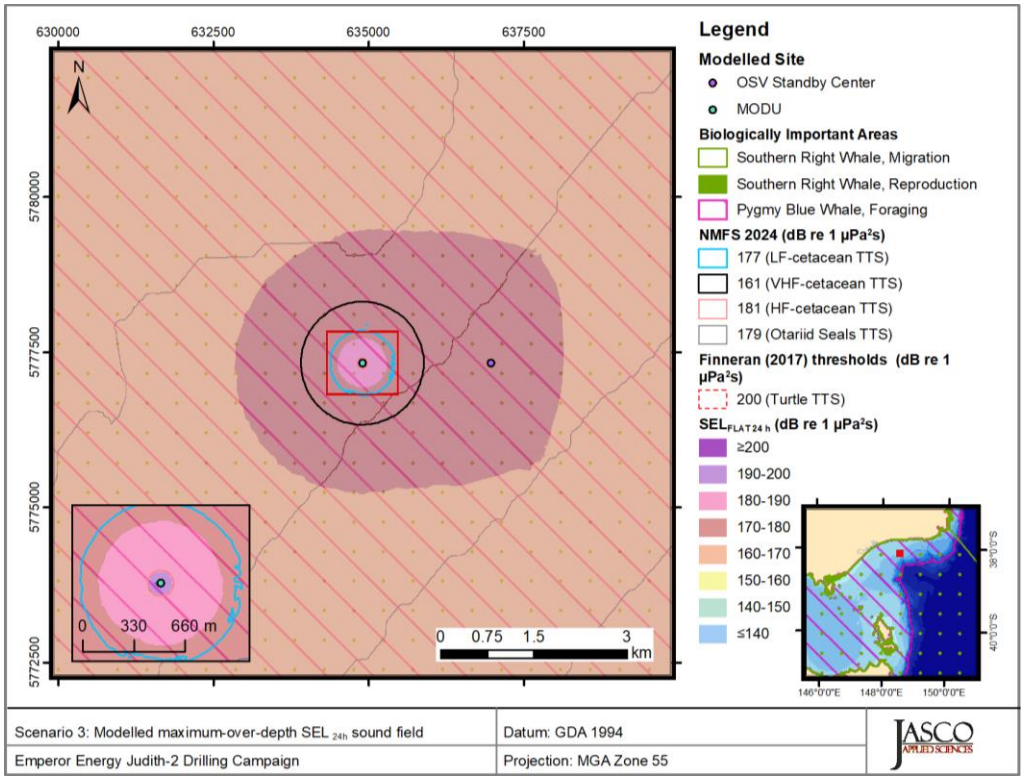


Figure 16. *Scenario 3: MODU Drilling + OSV Transit*: Sound level contour map showing maximum–over–depth SEL_{24h} results (unweighted/flat), along with frequency weighted isopleths for TTS in low, high, very high–frequency cetaceans, otariid seals and turtles. Thresholds omitted here were not reached or not long enough to display graphically.

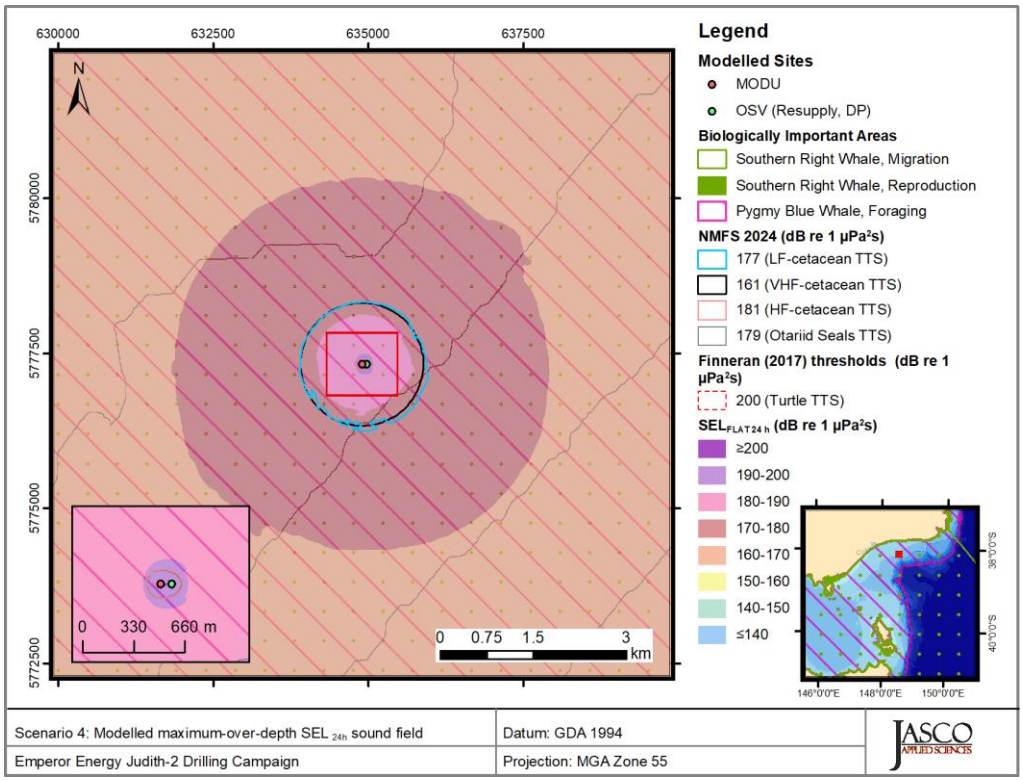


Figure 17. *Scenario 4: MODU Drilling + OSV DP*: Sound level contour map showing maximum–over–depth SEL_{24h} results (unweighted/flat), along with frequency weighted isopleths for TTS in low, high, very high–frequency cetaceans, otariid seals and turtles. Thresholds omitted here were not reached or not long enough to display graphically.

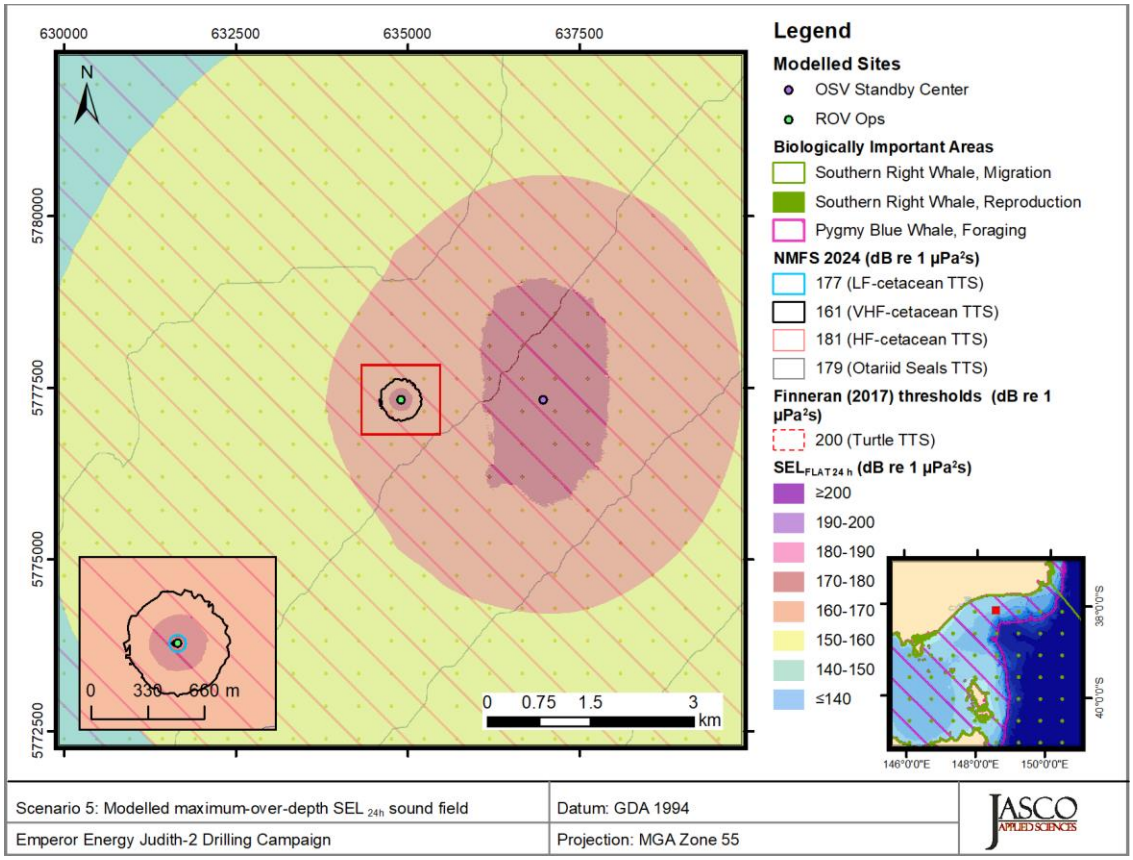


Figure 18. *Scenario 5: ROV Cutting + OSV Transit*: Sound level contour map showing maximum–over–depth SEL_{24h} results (unweighted/flat), along with frequency weighted for TTS in low, high, very high–frequency cetaceans, otariid seals and turtles. Thresholds omitted here were not reached or not long enough to display graphically.

4.2. Results for VSP Modelling

4.2.1. Acoustic Source Levels and Directivity

AASM (Appendix B.1) was used to predict the horizontal and vertical overpressure signatures and corresponding power spectrum levels for the seismic source, with results provided in Appendix B.2.1 along with the horizontal directivity plots for the selected source.

Table 26 shows the PK and per–pulse SEL source levels in the horizontal–plane broadside (perpendicular to the tow direction), endfire (along the tow direction), and vertical directions for the modelled array signature (a 600 in^3 seismic source). The vertical source level that accounts for the "surface ghost" (the out–of–phase reflected pulse from the water surface) is also presented to make it easier to compare the output to other seismic source models.

Figure B–3 in Appendix B.2.1 shows the broadside, endfire, and vertical overpressure signature and corresponding power spectrum levels for the source. The signature consists of a strong primary peak, related to the initial release of high–pressure air, followed by a series of pulses associated with bubble oscillations. Most energy was produced at frequencies below 500 Hz. Frequency–dependent peaks and nulls in the spectrum result from interference among airguns in the source and correspond with the volumes and relative locations of the airguns to each other.

Table 26. Far–field source level specifications for the 600 in^3 source, for a 5 m tow depth. Source levels are for a point–like acoustic source with equivalent far–field acoustic output in the specified direction. Sound level metrics are per–pulse and unweighted.

Direction	Peak source pressure level ($L_{s,pk}$; dB re 1 µPa m)	Per–pulse source SEL ($L_{s,E}$; dB re 1 µPa^{2}m^{2}s)	
		10–2000 Hz	2000–25000 Hz
Broadside	240.6	214.7	170.6
Endfire	239.2	214.3	172.6
Vertical	241.1	214.9	175.1
Vertical (surface affected source level)	241.1	216.6	178.3

4.2.2. Per–Pulse Sound Fields

This section presents the per–pulse sound fields in terms of maximum–over–depth SPL, SEL, and PK. The different metrics are presented for the following reasons:

- SPL sound fields were used to determine the distances to marine mammal and turtle behavioural thresholds (see Section 2).
- Per–pulse SEL sound fields are used as inputs into the 24 h SEL scenarios and to provide context for the range to 160 dB re 1 µPa^2·s, relevant for the EPBC Act Policy Statement 2.1 (DEWHA 2008).
- PK metrics within the water column are relevant to thresholds and guidelines for marine mammals, sea turtles, fish, fish eggs and larvae (Section 2).

The maximum and 95% distances to per–pulse SEL and SPL metrics are presented in Table 27 and Table 28. The SPL sound fields, and distances to relevant isopleths can be visualised on the contour maps presented in Section 4.1.2.1.

Maximum distances to maximum–over–depth water column PK thresholds were calculated for all single impulse sites and are presented in Table 29. Seafloor sound levels were assessed at 2 representative depths within the survey area (66.2 m and 66.65 m) and Table 30 and Table 31 present the PK and PK–PK results.

4.2.2.1. Tabulated Results

4.2.2.1.1. Water Column

Table 27. Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) from the VSP source to modelled maximum–over–depth and maximum–over–azimuth unweighted per–pulse sound exposure level (SEL) isopleths from the modelled single impulse sites, with the water depth indicated.

Per–pulse SEL (L_E; dB re 1 µPa²·s)	Site VSP (66.7 m)	
	R_{max} (km)	$R_{95\%}$ (km)
190	–	–
180	0.05	0.05
170	0.27	0.26
160[1]	1.32	1.15
150	3.64	3.13
140	8.33	7.24
130	25.5	21.3
120	71.2	58.8

[1] Low power zone assessment criteria DEWHA (2008).

Table 28. Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) from the VSP source to modelled maximum–over–depth and maximum–over–azimuth per–pulse sound pressure level (SPL) isopleths from the modelled single impulse sites, with the water depth indicated.

SPL (L_p; dB re 1 µPa)	Site VSP (66.7 m)	
	R_{max} (km)	$R_{95\%}$ (km)
200	–	–
190	0.04	0.04
180	0.23	0.22
175[1]	0.54	0.50
170	1.20	1.02
166[2]	1.74	1.54
160[3]	2.82	2.51
150	6.96	6.14
140	22.3	18.7

[1] Threshold for turtle behavioural disturbance from impulsive noise (McCauley et al. 2000).
[2] Threshold for turtle behavioural response to impulsive noise (McCauley et al. 2000, NSF 2011).
[3] Marine mammal behavioural threshold for impulsive sound sources (NOAA 2024).

Table 29. Maximum (R_{max}) horizontal distances (in km) from the VSP source to modelled maximum–over–depth peak pressure level (PK) thresholds based on NMFS (2024) for marine mammals, and Popper et al. (2014) for fish and Finneran et al. (2017) for sea turtles, at the modelled single impulse sites, with the water depth indicated.

Hearing group	PK threshold (L_{pk}; dB re 1 µPa)	Distance R_{max} (km)
Low–frequency cetaceans (PTS)	222	–
High–frequency cetaceans (PTS)	230	–
Very high–frequency cetaceans (PTS)	202	0.07
Otariid Seals (PTS)	230	–
Sea Turtles (PTS)	232	–
Low–frequency cetaceans (TTS)	216	–
High–frequency cetaceans (TTS)	224	–
Very high–frequency cetaceans (TTS)	196	0.28
Otariid Seals (TTS)	224	–
Sea Turtles (TTS)	226	–
Fish: No swim bladder (also applied to sharks)[1]	213	0.02
Fish: Swim bladder not involved in hearing[1], Swim bladder involved in hearing[1] Fish eggs, and larvae[2]	207	0.41

[1] Mortality and potential mortal injury, and recoverable injury threshold
[2] Mortality and potential mortal injury threshold
A dash indicates the threshold is not reached within the limits of the modelling resolution (20 m).

4.2.2.1.2. Seafloor

Ranges presented at the seafloor provided in Tables 30 and 31 are different to those for the maximum–over–depth modelling results presented in Table 29. This is because the model used for the water column results, FWRAM (Appendix C.3.2) does not represent the maximum sound levels at the seafloor close to the array. This is because FWRAM is based on a wide–angle parabolic equation (PE) algorithm which is valid to only approximately 70° down angle from the horizontal, and while it provides accurate predictions in the horizontal direction, it cannot predict sound levels directly under the array. The VSTACK model (Appendix C.3.3) is therefore used to determine the levels at the seafloor directly under the array, and due to seafloor interactions, these can be greater than those elsewhere in the water column.

Table 30. Maximum (R_{max}) horizontal distances (in m) from the VSP source to modelled seafloor (receiver located 0.5 m above seafloor) peak pressure level thresholds (PK) within the modelling area.

Hearing group/animal type	PK threshold (L_{pk}; dB re 1 µPa)	Distance R_{max} (m)
		Receiver Depth: 66.2 m
Sound levels for sponges and corals[1]	226	*
Fish: I	213	*
Fish: II, III, Fish eggs, and larvae	207	21.3

[1] Heyward et al. (2018)
An asterisk indicates that the sound level was not reached.
Fish I–No swim bladder; Fish II–Swim bladder not involved with hearing; Fish III–Swim bladder involved with hearing.

Table 31. Maximum (R_{max}) horizontal distances (in m) from the VSP source to modelled seafloor (receiver located 5 cm above seafloor) peak–peak pressure levels (PK–PK) within the modelling area. Results included in relation to benthic invertebrates.

PK–PK (L_{pk-pk}; dB re 1 µPa)	Distance R_{max} (m)
	Receiver Depth: 66.65 m
213[1,2,3]	*
212[2,3]	18.7
210[1,2]	51.2
209[1,2]	63.9
202[4]	184.4

1 Day et al. (2019), lobster
2 Day et al. (2016a), lobster and scallops
3 Day et al. (2017), scallops.
4 Payne et al. (2008), lobster
An asterisk indicates that the sound level was not reached.

4.2.2.2. Sound Field Map

A sound level contour map of VSP SPL results is included in this section.

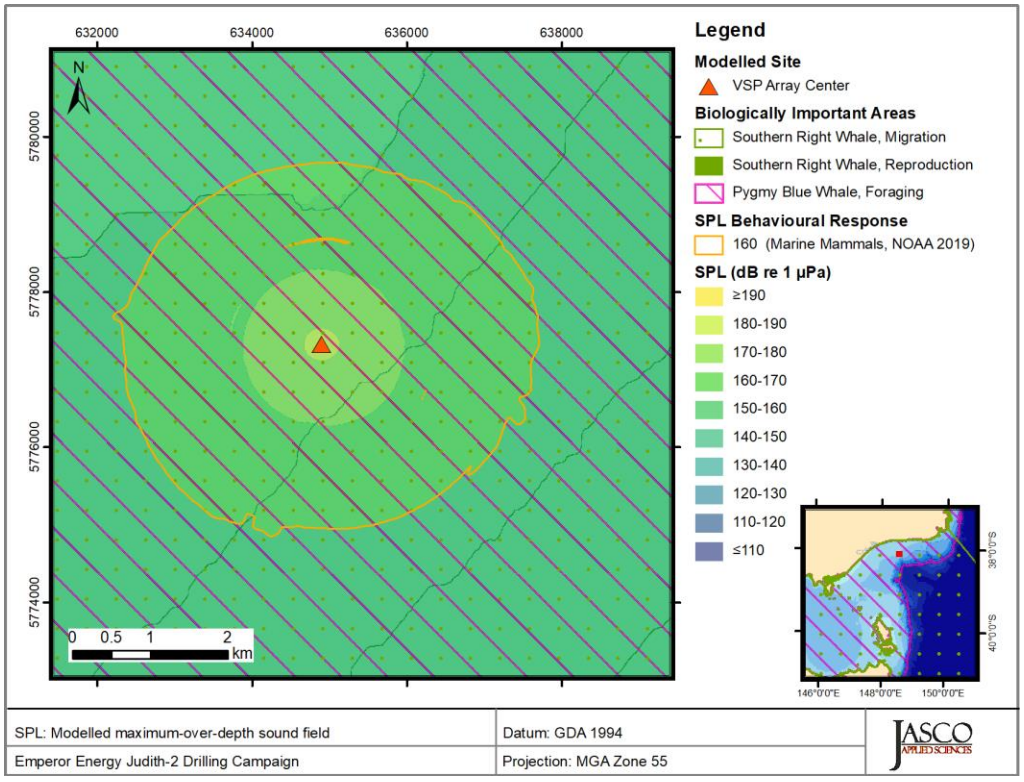


Figure 19. *VSP Site, static source*: Sound level contour map maximum–over–depth SPL sound field in 10 dB steps, and the isopleths for behavioural response thresholds for marine mammals.

4.2.2.3. Particle Motion Metrics

Figure 20 shows modelled maximum particle acceleration as a function of horizontal range in four perpendicular directions from the centre of the 600 in^3 seismic source at water depth 66.7 m

corresponding to the VSP site (refer to Section 1.2). The modelling considered a resolution of 20 m, and a receiver positioned 5 cm off the seafloor. The maximum distance to a particle acceleration of 37.57 ms^{-2} is not predicted to occur at a water depth of 66.7 m.

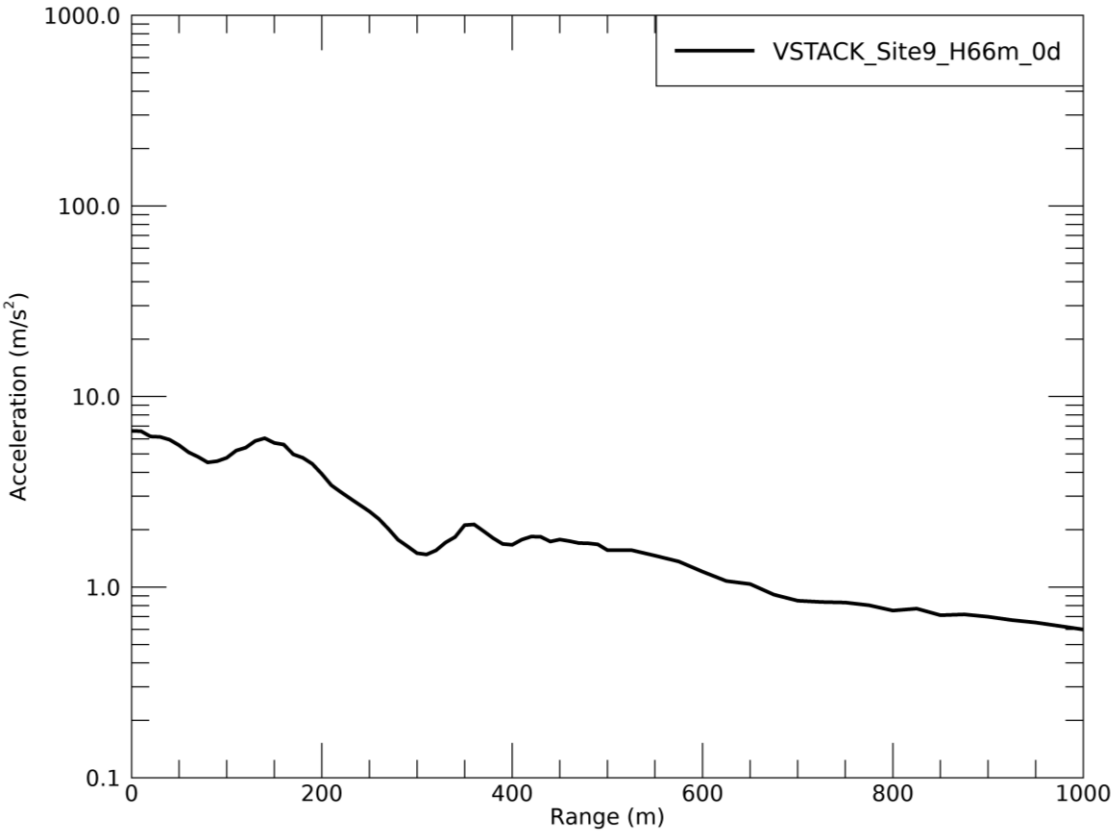


Figure 20. 600 in^3 VSP seismic source at 66.7 m water depth: Peak particle acceleration magnitude at the seafloor as a function of horizontal range from the centre of the seismic source along four directions.

Particle motion was modelled at a depth of 5 cm above the seafloor for an associated assessment for invertebrates. The peak particle acceleration magnitude of 37.57 ms^{-2} was not reached (Table 32) at the modelled water depth. This particle acceleration threshold was assessed for invertebrates by Day et al. (2016a).

Table 32. Maximum (R_{max}) horizontal distances (in m) from the 600 in^3 to particle motion level: Peak acceleration magnitude level (m/s^2), 5 cm above the seafloor. Results included in relation to benthic invertebrates (Section 2.1.2).

Hearing group/animal type	Peak Acceleration Magnitude (m/s^2)	Water Depth
		66.65 m
		Distance R_{max} (m)
Benthic invertebrates	37.57	*

An asterisk indicates that the particle motion level was not reached.

4.2.3. Multiple Pulse Sound Fields

This section presents the sound fields in terms of SEL accumulated over 24 h of survey, for the modelled scenario (Section 1.3) with 9 activation configurations. Frequency–weighted SEL_{24h} sound fields were used to estimate the maximum and 95% distances (R_{max} and $R_{95\%;}$ calculated as detailed in Appendix 5.4.C.4) to marine mammals and turtle TTS and PTS thresholds (listed in Table 33), and to estimate maximum distance and the area to injury and TTS guidelines for fish (Table 34).

The SEL_{24h} sound fields are presented as contour maps in Section 4.2.3.2 for the modelled scenarios. The maps present the unweighted SEL_{24h} in 10 dB steps, as well as the isopleths corresponding to thresholds or guidelines for which R_{max} was greater than 20 m.

4.2.3.1. Tabulated Results

Table 33. VSP, multiple–pulse SEL: Maximum–over–depth distances (in km) to frequency–weighted 24 hour sound exposure level (SEL_{24h}) based permanent threshold shift (PTS) and temporary threshold shift (TTS) for marine mammals (NMFS 2024) and sea turtles Finneran et al. (2017) from VSP operations, assuming different numbers of impulses during a 24 h period.

Hearing group	Threshold for SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)	Number of Shots								
		5 R_{max} (km)	10 R_{max} (km)	25 R_{max} (km)	50 R_{max} (km)	100 R_{max} (km)	150 R_{max} (km)	200 R_{max} (km)	250 R_{max} (km)	300 R_{max} (km)
PTS										
LF cetaceans	183	0.04	0.06	0.17	0.26	0.37	0.51	0.63	0.74	0.85
HF cetaceans	193	–	–	–	–	–	–	–	–	–
VHF cetaceans	159	–	–	–	–	–	–	–	–	–
Sea turtles	204	–	–	–	–	0.02	0.03	0.03	0.04	0.05
Otariid Seals	185	–	–	–	–	–	–	–	–	–
TTS										
LF cetaceans	168	0.54	0.89	1.54	2.24	2.98	3.71	4.08	4.58	4.82
HF cetaceans	178	–	–	–	–	–	0.02	0.02	0.03	0.03
VHF cetaceans	144	–	0.02	0.03	0.05	0.06	0.09	0.09	0.11	0.16
Sea turtles	189	0.03	0.05	0.06	0.17	0.26	0.31	0.38	0.46	0.53
Otariid Seals	170	–	–	–	–	0.03	0.03	0.04	0.05	0.05

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

Table 34. Distances to 24 hour sound exposure level (SEL_{24h}) based fish criteria in the water column for the 600 in^3 array.

Marine fauna group	Threshold for SEL_{24h} ($L_{E,24h}$; dB re 1 $\mu Pa^2 \cdot s$)	Number of Shots								
		5 R_{max} (km)	10 R_{max} (km)	25 R_{max} (km)	50 R_{max} (km)	100 R_{max} (km)	150 R_{max} (km)	200 R_{max} (km)	250 R_{max} (km)	300 R_{max} (km)
Mortality and potential mortal injury										
I	219	–	–	–	–	–	–	–	–	–
II, fish eggs and fish larvae	210	–	–	–	–	–	–	0.02	0.02	0.02
III	207	–	–	–	–	0.02	0.02	0.03	0.03	0.03
Fish recoverable injury										
I	216	–	–	–	–	–	–	–	–	–
II, III	203	–	–	–	0.02	0.03	0.04	0.05	0.05	0.06
Fish temporary threshold shift (TTS)										
I, II, III	186	0.05	0.14	0.22	0.31	0.51	0.71	0.83	0.96	1.07

Fish I–No swim bladder;
Fish II–Swim bladder not involved with hearing;
Fish III–Swim bladder involved with hearing.
An asterisk indicates that the threshold was not reached.

4.2.3.2. Sound Level Contour Map

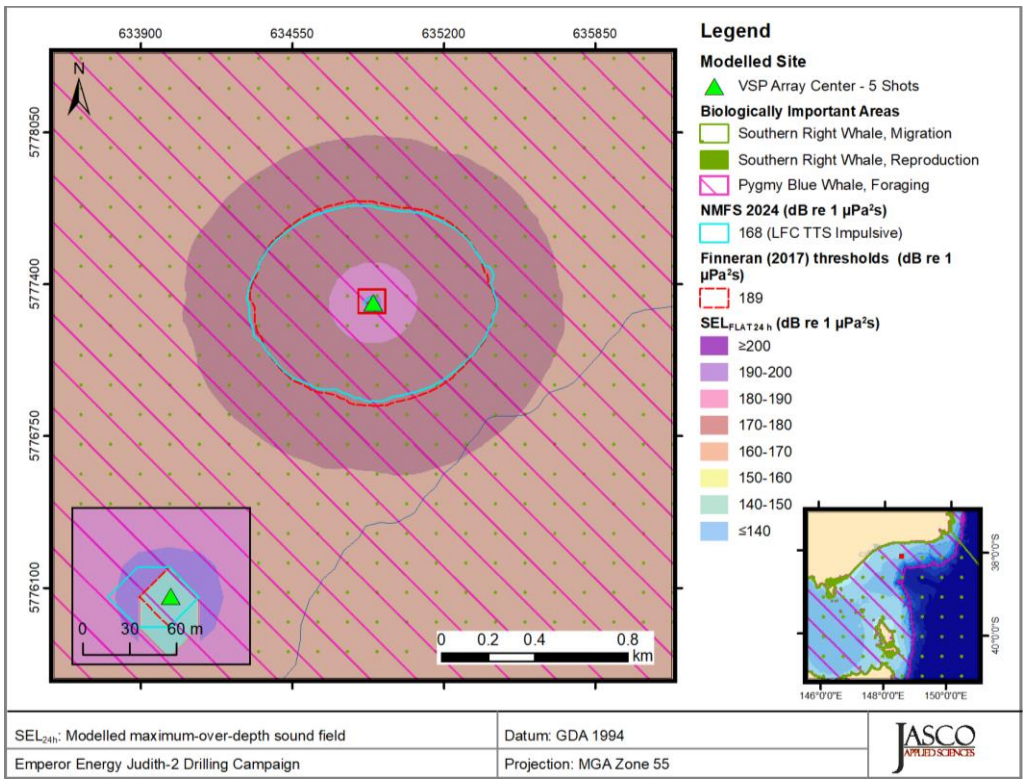


Figure 21. *VSP with 5 Shots*: Sound level contour map of unweighted maximum–over–depth SEL_{24h} results, along with isopleths for cetaceans, and turtles. Thresholds omitted here were not reached or not large enough to display graphically. Refer to Tables 33 and 34 for threshold distances.

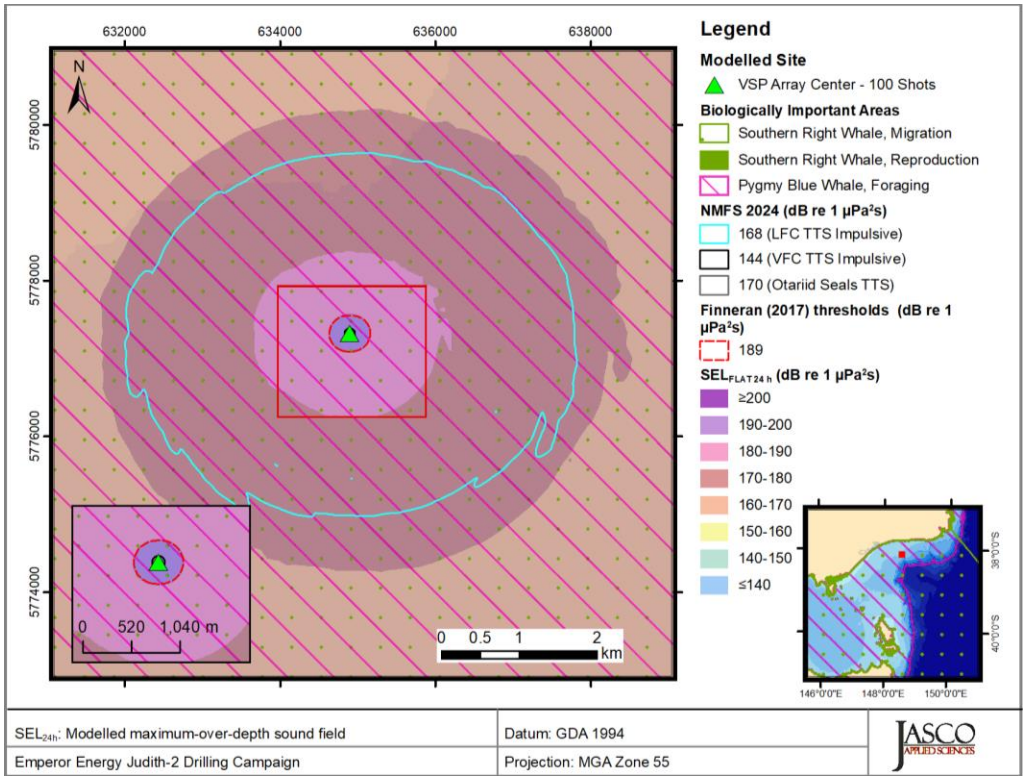


Figure 22. *VSP with 100 Shots*: Sound level contour map of unweighted maximum–over–depth SEL_{24h} results, along with isopleths for cetaceans and turtles. Thresholds omitted here were not reached or not large enough to display graphically. Refer to Tables 33 and 34 for threshold distances.

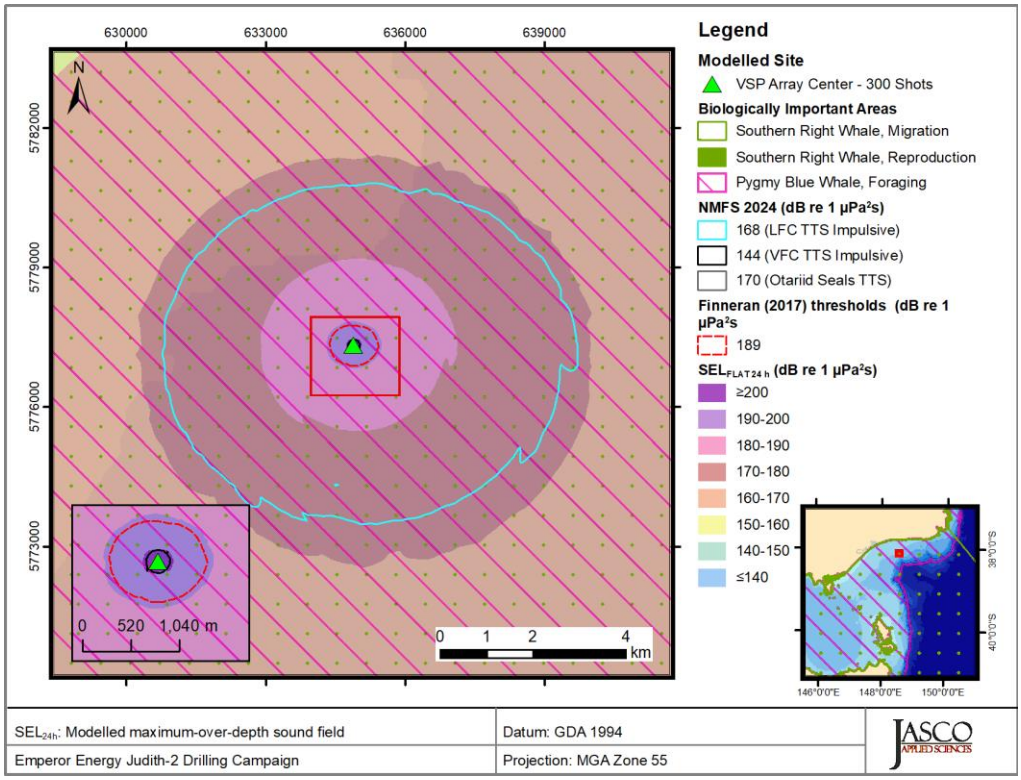


Figure 23. *VSP with 300 Shots*: Sound level contour map of unweighted maximum–over–depth SEL_{24h} results, along with isopleths for cetaceans and turtles. Thresholds omitted here were not reached or not large enough to display graphically. Refer to Tables 33 and 34 for threshold distances.

4.3. Results for 2D Shallow Hazards Seismic Survey Modelling

4.3.1. Acoustic Source Levels and Directivity

AASM (Appendix B.1) was used to predict the horizontal and vertical overpressure signatures and corresponding power spectrum levels for the seismic source, with results provided in Appendix B.2.1 along with the horizontal directivity plots for the selected source.

Table 26 shows the PK and per–pulse SEL source levels in the horizontal–plane broadside (perpendicular to the tow direction), endfire (along the tow direction), and vertical directions for the modelled array signature (a 160 in^3 seismic source). The vertical source level that accounts for the "surface ghost" (the out–of–phase reflected pulse from the water surface) is also presented to make it easier to compare the output to other seismic source models.

Figure B–3 in Appendix B.2.1 shows the broadside, endfire, and vertical overpressure signature and corresponding power spectrum levels for the source. The signature consists of a strong primary peak, related to the initial release of high–pressure air, followed by a series of pulses associated with bubble oscillations. Most energy was produced at frequencies below 500 Hz. Frequency–dependent peaks and nulls in the spectrum result from interference among airguns in the source and correspond with the volumes and relative locations of the airguns to each other.

Table 35. Far–field source level specifications for the 160 in^3 source, for a 7 m tow depth. Source levels are for a point–like acoustic source with equivalent far–field acoustic output in the specified direction. Sound level metrics are per–pulse and unweighted.

Direction	Peak source pressure level ($L_{S,pk}$; dB re 1 µPa m)	Per–pulse source SEL ($L_{S,E}$; dB re 1 $\mu Pa^2 m^2 s$)	
		10–2000 Hz	2000–25000 Hz
Broadside	230.1	208.4	170.4
Endfire	230.1	208.4	170.4
Vertical	230.1	208.4	170.4
Vertical (surface affected source level)	230.1	209.1	173.4

4.3.2. Per–Pulse Sound Fields

This section presents the per–pulse sound fields in terms of maximum–over–depth SPL, SEL, and PK. The different metrics are presented for the following reasons:

- SPL sound fields were used to determine the distances to marine mammal and turtle behavioural thresholds (see Section 2).
- Per–pulse SEL sound fields are used as inputs into the 24 h SEL scenario/s and to provide context for the range to 160 dB re 1 $\mu Pa^2 \cdot s$, relevant for the EPBC Act Policy Statement 2.1 (DEWHA 2008).
- PK metrics within the water column are relevant to thresholds and guidelines for marine mammals, sea turtles, fish, fish eggs and larvae (Section 2).

The maximum and 95% distances to per–pulse SEL and SPL metrics are presented in Table 27 and Table 28. The SPL sound fields, and distances to relevant isopleths can be visualised on the contour maps presented in Section 4.3.2.2.

Maximum distances to maximum–over–depth water column PK thresholds were calculated for the single impulse site and are presented in Table 29. Seafloor sound levels were assessed at 2 representative depths within the survey area (66.2 m and 66.65 m) and Tables 30 and 31 present the PK and PK–PK results.

4.3.2.1. Tabulated Results

4.3.2.1.1. Water Column

Table 36. Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) from the seismic source to modelled maximum–over–depth and maximum–over–azimuth unweighted per–pulse sound exposure level (SEL) isopleths from the modelled single impulse sites, with the water depth indicated.

Per–pulse SEL (L_E; dB re 1 µPa²·s)	Site 2D Seismic (66.7 m)	
	R_{max} (km)	$R_{95\%}$ (km)
190	–	–
180	–	–
170	0.06	0.06
160[1]	0.43	0.42
150	1.77	1.65
140	4.43	4.02
130	11.0	9.96
120	34.1	28.8

[1] Low power zone assessment criteria DEWHA (2008).

Table 37. Maximum (R_{max}) and 95% ($R_{95\%}$) horizontal distances (in km) from the seismic source to modelled maximum–over–depth and maximum–over–azimuth per–pulse sound pressure level (SPL) isopleths from the modelled single impulse sites, with the water depth indicated.

SPL (L_p; dB re 1 µPa)	Site 2D Seismic (66.7 m)	
	R_{max} (km)	$R_{95\%}$ (km)
200	–	–
190	–	–
180	0.05	0.05
175[1]	0.17	0.17
170	0.40	0.39
166[2]	0.70	0.64
160[3]	1.48	1.34
150	3.52	3.16
140	9.66	8.64

[1] Threshold for turtle behavioural disturbance from impulsive noise (McCauley et al. 2000).
[2] Threshold for turtle behavioural response to impulsive noise (McCauley et al. 2000, NSF 2011).
[3] Marine mammal behavioural threshold for impulsive sound sources (NOAA 2024).

Table 38. Maximum (R_{max}) horizontal distances (in km) from the seismic source to modelled maximum–over–depth peak pressure level (PK) thresholds based on NMFS (2024) for marine mammals, and Popper et al. (2014) for fish and Finneran et al. (2017) for sea turtles, at the modelled single impulse sites, with the water depth indicated.

Hearing group	PK threshold (L_{pk}; dB re 1 µPa)	Distance R_{max} (km)
Low–frequency cetaceans (PTS)	222	–
High–frequency cetaceans (PTS)	230	–
Very high–frequency cetaceans (PTS)	202	0.03
Otariid Seals (PTS)	230	–
Sea Turtles (PTS)	232	–
Low–frequency cetaceans (TTS)	216	–
High–frequency cetaceans (TTS)	224	–
Very high–frequency cetaceans (TTS)	196	0.05
Otariid Seals (TTS)	224	–
Sea Turtles (TTS)	226	–
Fish: No swim bladder (also applied to sharks)[1]	213	–
Fish: Swim bladder not involved in hearing[1], Swim bladder involved in hearing[1] Fish eggs, and larvae[2]	207	–

[1] Mortality and potential mortal injury, and recoverable injury threshold
[2] Mortality and potential mortal injury threshold
A dash indicates the threshold is not reached within the limits of the modelling resolution (20 m).

4.3.2.1.2. Seafloor

Ranges presented at the seafloor provided in Tables 30 and 31 are different to those for the maximum–over–depth modelling results presented in Table 29. This is because the model used for the water column results, FWRAM (Appendix C.3.2), does not represent the maximum sound levels at the seafloor close to the array. This is because FWRAM is based on a wide–angle parabolic equation (PE) algorithm which is valid to only approximately 70° down angle from the horizontal, and while it provides accurate predictions in the horizontal direction, it cannot predict sound levels directly under the array. The VSTACK model (Appendix C.3.3) is therefore used to determine the levels at the seafloor directly under the array, and due to seafloor interactions, these can be greater than those elsewhere in the water column.

Table 39. Maximum (R_{max}) horizontal distances (in m) from the seismic source to modelled seafloor (receiver 5 cm above seafloor) peak pressure level thresholds (PK) within the modelling area.

Hearing group/animal type	PK threshold (L_{pk}; dB re 1 µPa)	Distance R_{max} (m)
		Receiver Depth:66.2 m
Sound levels for sponges and corals[1]	226	*
Fish: I	213	*
Fish: II, III, Fish eggs, and larvae	207	*

[1] Heyward et al. (2018)

An asterisk indicates that the sound level was not reached.
Fish I–No swim bladder; Fish II–Swim bladder not involved with hearing; Fish III–Swim bladder involved with hearing.

Table 40. Maximum (R_{max}) horizontal distances (in m) from the seismic source to modelled seafloor (receiver located and 5 cm above seafloor) peak–peak pressure levels (PK–PK) within the modelling area. Results included in relation to benthic invertebrates.

PK–PK (L_{pk-pk}; dB re 1 µPa)	Distance R_{max} (m)
	Receiver Depth: 66.65 m
213[1,2,3]	*
212[2,3]	*
210[1,2]	*
209[1,2]	*
202[4]	3.6

[1] Day et al. (2019), lobster
[2] Day et al. (2016a), lobster and scallops
[3] Day et al. (2017), scallops.
[4] Payne et al. (2008), lobster
An asterisk indicates that the sound level was not reached.

4.3.2.2. Sound Field Maps and Graphs

4.3.2.2.1. Sound Level Contour Maps

Sound level contour maps of SPL are included in this section.

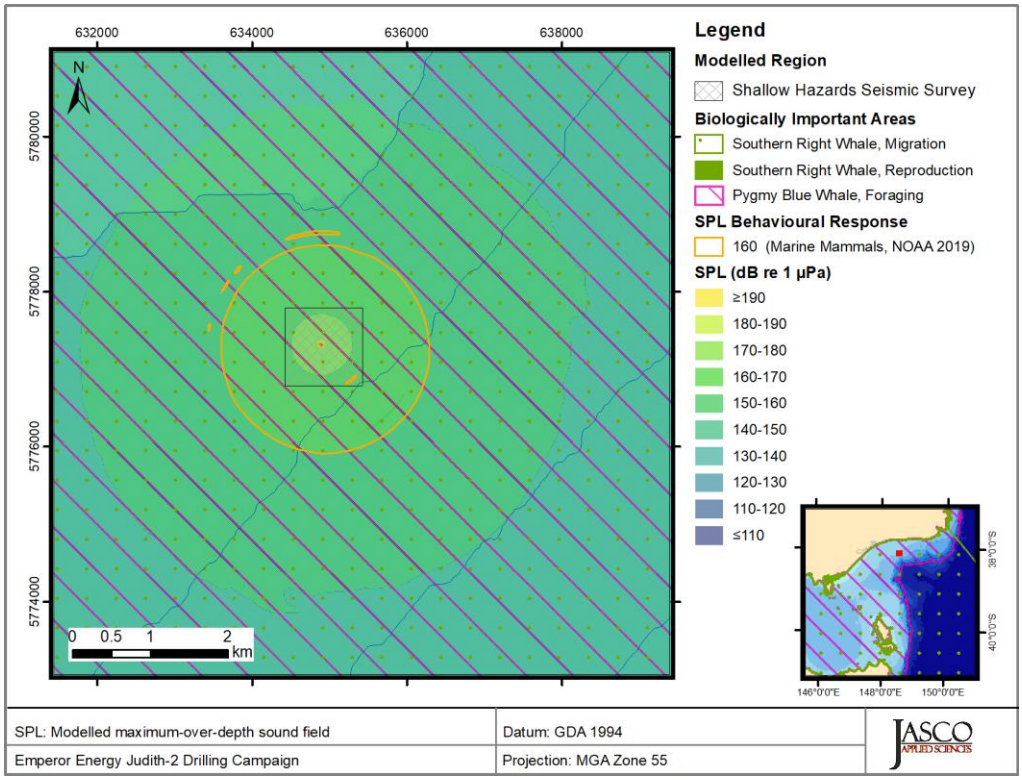


Figure 24. *2D Shallow Hazards Seismic Survey Site, tow azimuth 0°*: Sound level contour map of maximum–over–depth SPL sound field in 10 dB steps, and the isopleths for behavioural response thresholds for marine mammals.

4.3.2.3. Particle Motion Metrics

Figure 20 shows modelled maximum particle acceleration as a function of horizontal range in four perpendicular directions from the centre of the 160 in^3 seismic source at water depth 66.65 m corresponding to the 2D Seismic centre (Site 81 in the graph). The modelling considered a resolution of 20 m, and a receiver positioned 5 cm off the seafloor. The maximum distance to a particle acceleration 37.57 ms^{-2} is not predicted to occur at a water depth of 66.65 m.

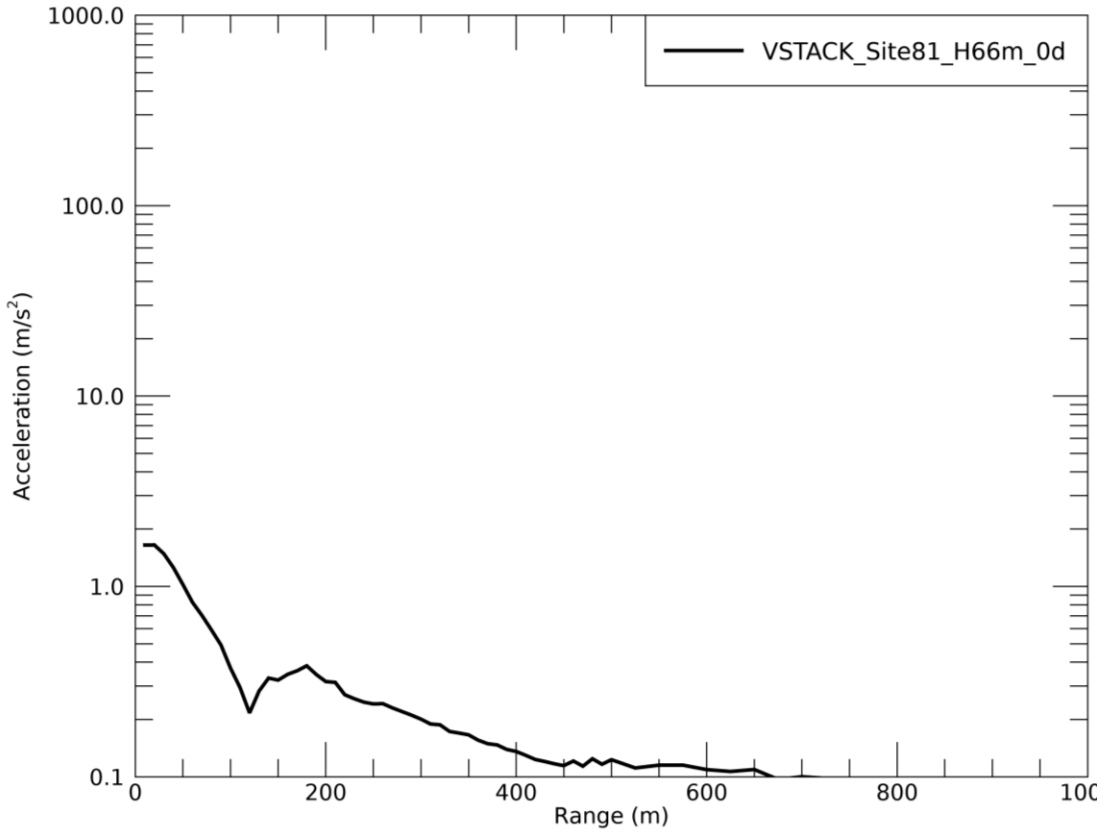


Figure 25. 160 in³ seismic source at 66.65 m water depth: Peak particle acceleration magnitude at the seafloor as a function of horizontal range from the centre of the seismic source along four directions.

Particle motion was modelled at a depth of 5 cm above the seafloor for an associated assessment for invertebrates. The maximum distances in metres to a peak particle acceleration magnitude of 37.57 ms^{-2} are presented in Table 32 for 1 considered water depths. This particle acceleration threshold was assessed for invertebrates by Day et al. (2016a).

Table 41. Maximum (R_{max}) horizontal distances (in m) from the 160 in³ to particle motion level: Peak acceleration magnitude level (m/s^2), 5 cm above the seafloor. Results included in relation to benthic invertebrates (Section 2.1.2).

Hearing group/animal type	Peak Acceleration Magnitude (m/s^2)	Water Depth
		66.65 m
		Distance R_{max} (m)
Benthic invertebrates	37.57	*

An asterisk indicates that the particle motion level was not reached.

4.3.3. Multiple Pulse Sound Fields

This section presents the sound fields in terms of SEL accumulated over 24 h of survey, for the modelled scenario (Section 1.3). Frequency–weighted SEL_{24h} sound fields were used to estimate the maximum and 95% distances (R_{max} and $R_{95\%;}$ calculated as detailed in Appendix C.4) to marine mammals and turtle PTS and TTS thresholds (listed in Table 33), and to estimate maximum distance and the area to injury and TTS guidelines for fish (Table 34).

The SEL_{24h} sound fields are presented as contour maps in Section 4.3.3.2 for the modelled scenarios. The maps present the unweighted SEL_{24h} in 10 dB steps, as well as the isopleths corresponding to thresholds or guidelines for which R_{max} was greater than 20 m.

4.3.3.1. Tabulated Results

Table 42. Maximum–over–depth distances (in km) to frequency–weighted 24 hour sound exposure level (SEL_{24h}) based permanent threshold shift (PTS) and temporary threshold shift (TTS) for marine mammals (NMFS (2024) et al. 2019) and sea turtles Finneran et al. (2017) using the 160 in^3 array.

Hearing group	Threshold for SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)	Scenario 2D Seismic	
		R_{max} (km)	Area (km²)
PTS			
LF cetaceans	183	0.02	0.17
HF cetaceans	193	–	–
VHF cetaceans	159	–	–
Sea turtles	204	–	–
Otariid Seals	185	–	–
TTS			
LF cetaceans	168	2.00	18.95
HF cetaceans	178	–	–
VHF cetaceans	144	–	–
Sea turtles	189	–	–
Otariid Seals	170	–	–

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

Table 43. Distances to 24-hour sound exposure level (SEL_{24h}) based fish criteria in the water column for the 160 in^3 array.

Marine fauna group	Threshold for SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)	Scenario 2D Seismic	
		R_{max} (km)	Area (km²)
Mortality and potential mortal injury			
I	219	–	–
II, fish eggs and fish larvae	210	–	–
III	207	–	–
Fish recoverable injury			
I	216	–	–
II, III	203	–	–
Fish temporary threshold shift (TTS)			
I, II, III	186	0.10	1.29

Fish I–No swim bladder;
Fish II–Swim bladder not involved with hearing;
Fish III–Swim bladder involved with hearing.
An asterisk indicates that the threshold was not reached.

4.3.3.2. Sound Level Contour Map

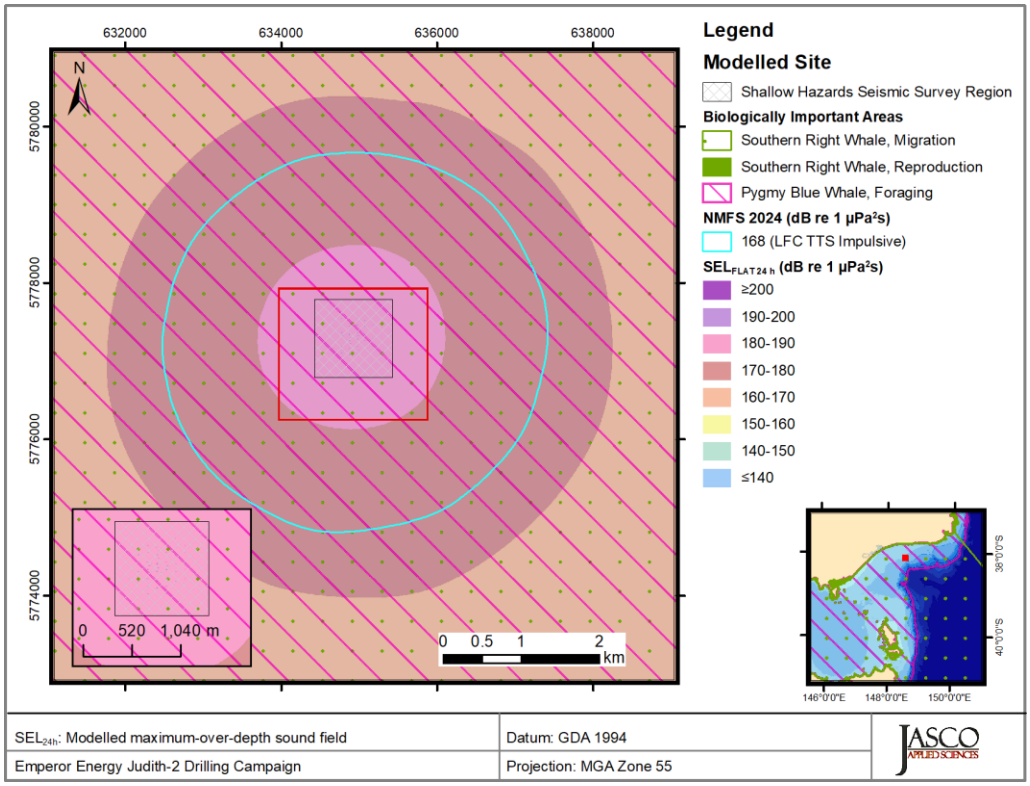


Figure 26. *Scenario 2D Seismic Survey*: Sound level contour map of unweighted maximum–over–depth SEL_{24h} results, along with isopleths for low frequency cetaceans. Thresholds omitted here were not reached or not large enough to display graphically. Refer to Tables 33 and 34 for threshold distances.

5. Discussion

This modelling study predicted underwater sound levels associated with Emperor Energy's activities and operations at the Judith-2 exploration site. The modelled sound–emitting activities were vessel and drilling operations, vertical seismic profiling (VSP) and 2D seismic survey for shallow water hazard identification. The modelling study considered 5 vessel and drilling scenarios (Scenario 1–5), a VSP site, and a 2D seismic survey scenario. Maximum, 95th percentile ranges (R_{max} and $R_{95\%}$) and ensonified area were computed to PTS, TTS, and behavioural response thresholds.

5.1. Acoustic Modelling – Vessels and Drilling Scenarios

Table 44 summarises the maximum horizontal distances to behavioural (unweighted SPL) and physiological effects (weighted TTS and PTS) thresholds across all five modelled individual vessel and drilling activity scenarios.

For the results tables presented in Section 4.1.1, where a dash is used in place of a horizontal distance, these thresholds may or may not be reached. Due to the discretely sampled 20 m calculation grids of the modelled sound fields, distances to these levels could not be estimated for practicable computational purposes. It is likely that SPL isopleths could be reached at distances between the source and the modelled horizontal resolution (20 m); however, distances to injurious accumulated SEL thresholds may not be reached at any range due the species–specific frequency weighing functions. Additionally, if close–to–source radii are comparable to the dimensions of the modelled vessel then they may only be reached within close proximity to a vessel, if at all.

Table 44. Summary of marine mammal results from vessel and drilling modelling: Summary of maximum (R_{max}) horizontal distances (in km), from all scenarios considered, to the NOAA (2024) marine mammal behavioural response criterion of 120 dB re 1 µPa (SPL, unweighted) and frequency–weighted SEL_{24h} TTS and PTS thresholds based on NMFS (2024). TTS and PTS results are presented for the hearing group that resulted in the maximum range. Associated ensonified areas are also provided for TTS and PTS thresholds.

Scenario Number	Description	Marine Mammal Behavioural Response – SPL [a] R_{max} (km)	TTS – SEL_{24h} [b]	PTS – SEL_{24h} [b]
			R_{max} (km)	R_{max} (km)
1	Prelay and Anchor Setup	23.7	8.20 (LF-cetacean)	0.44 (LF-cetacean)
2	MODU Drilling	2.24	0.99 (VHF-cetacean)	0.06 (VHF-cetacean)
3	MODU Drilling with OSV on Standby	3.31	0.99 (VHF-cetacean)	0.06 (VHF-cetacean)
4	MODU Drilling with OSV under DP (8 hours)	5.22	1.07 (LF-cetacean)	0.13 (VHF-cetacean)
5	OSV on Standby with ROV Cutting	3.06	0.31 (VHF-cetacean)	0.03 (VHF-cetacean)

Noise exposure criteria: [a] NOAA (2024) and [b] NMFS (2024).
A dash indicates the level was not reached within the limits of the modelled resolution (20 m).

The shortest horizontal distances to effect thresholds were generally associated with scenario 2 that modelled the MODU drilling with no additional vessels in action; its behavioural response distance was 2.24 km, and its largest low–frequency (LF) cetacean TTS zone was 0.53 km (Tables 25 and 26).

In Scenario 1, the prelay and anchor setup scenario generally resulted in the longest distances to effect thresholds (Tables 25 and 26). The 120 dB SPL marine mammal behavioural effect zone from

AHTS vessel activities featured a maximum radius of 23.7 km with the AHTS under dynamic positioning (DP) being the most dominant source.

5.2. Acoustic Modelling – VSP Scenario

The VSP produces generally symmetric sound source level across the horizontal–plane and vertical directions for the modelled array signature (a 600 in^3 seismic source) as shown in Table 26.

Table 33 shows that as the number of shots over the 24 hours period increases, the range to effect criteria increases; modelling with 300 number of shots over the 24 hour period resulted in the largest ranges to considered effect criteria.

Marine mammals:

Marine mammal injury criteria, from NMFS (2024), requires two metrics (PK and SEL_{24h}) to be considered for impulsive noise when assessing marine mammal TTS and PTS with the longest distance associated with either metric required to be applied. In this study, the longest horizontal distances to the low–frequency cetacean TTS and PTS thresholds were associated with the SEL24h metric for the modelled scenario with 300 shots (4.82 and 0.85 km, respectively), while the longest horizontal distances to the very high–frequency cetacean TTS and PTS thresholds were associated with the PK metric (0.28 and 0.07 km, respectively).

The maximum distance to the NOAA (2024) marine mammal behavioural response criterion of 160 dB re 1 µPa (SPL) was 2.82 km.

Sea turtles:

For sea turtles, the maximum distance to the SEL_{24h} metrics of 189 dB re 1 μPa^2s for TTS and 204 dB re 1 μPa^2s for PTS was 0.53 km for TTS onset and 0.05 km for PTS onset for the 600 in^3 seismic source with 300 shots over the 24 hour modelled period (Finneran et al. 2017). As is the case with marine mammals, a reported radius for SEL_{24h} criteria does not mean that sea turtles travelling within this radius of the source will be injured, but rather that an animal could be exposed to the sound level associated with either PTS or TTS if it remained in that location for 24 hours.

Neither the PK sea turtle injury criteria of 226 dB re 1 µPa for TTS nor 232 dB re 1 µPa for PTS from Finneran et al. (2017) were not exceeded at a distance longer than 20 m from the acoustic centre of the source.

The maximum distances to the behavioural response criteria for sea turtles of 166 dB re 1 µPa (SPL) and the 175 dB re 1 µPa (SPL) threshold for behavioural disturbance were 1.74 km and 0.54 km, respectively for the 600 in^3 seismic source (McCauley et al. 2000).

Fish, fish eggs, and fish larvae:

The effects of sound exposure on fish were considered in relation to both PK and SEL_{24h} metrics associated with mortality, potential mortal injury and impairment, based on quantitative criteria from Popper et al. (2014) for the following groups:

- Fish without a swim bladder (also appropriate for sharks in the absence of other information),
- Fish with a swim bladder that do not use it for hearing,
- Fish that use their swim bladders for hearing, and
- Fish eggs and fish larvae.

Table 45 summarises the maximum distances to effect criteria for fish, fish eggs, and fish larvae along with the relevant metric across all three modelled locations.

Table 45. Summary of maximum fish, fish eggs, and larvae injury and temporary threshold shift (TTS) onset distances for any modelled site, for single impulse and 24 h sound exposure level (SEL_{24h}) modelled scenarios.

Relevant hearing group	Effect criteria	Water column	
		Metric associated with longest distance to criteria	R_{max} (km)
Fish: No swim bladder	Recoverable injury	–	–
	TTS	SEL_{24h}	1.07
Fish: Swim bladder not involved in hearing and Swim bladder involved in hearing	Recoverable injury	SEL_{24h}	0.06
	TTS	SEL_{24h}	1.07
Fish eggs, and larvae	Injury	SEL_{24h}	0.02

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

Benthic invertebrates:

The maximum radius of ensonified areas where sound levels exceeded 202 dB re 1 µPa PK–PK (Payne et al. 2008) was considered for seafloor sound levels; the sound level was reached at 184.4 m from the acoustic centre of the VSP array in a water depth of 66.7 m; in this area crustaceans may be negatively affected by sound. Sound levels of 209 to 213 dB re 1 µPa PK–PK (Day et al. (2016a); Day et al (2016b)), which are related to crustacean impairment, were also considered in this study; the levels reached for VSP modelling site at a depth of 5 cm above the seafloor are shown in Table 46.

Table 46: Maximum (R_{max}) horizontal distances (in m) from the seismic source to modelled seafloor (receiver located 5 cm above seafloor) peak–peak pressure levels (PK–PK) within the modelling area. Results included in relation to benthic invertebrates.

PK–PK (L_{pk-pk}; dB re 1 µPa)	Distance R_{max} (m)
	Receiver Depth: 66.65 m
213[1,2,3]	*
212[2,3]	18.7
210[1,2]	51.2
209[1,2]	63.9
202[4]	184.4

1 Day et al. (2019), lobster
2 Day et al. (2016a), lobster and scallops
3 Day et al. (2017), scallops.
4 Payne et al. (2008), lobster

5.3. Acoustic Modelling – 2D Shallow Hazards Seismic Scenario

The single airgun seismic source produces symmetric sound source level across the horizontal–plane broadside (perpendicular to the tow direction), endfire (along the tow direction), and vertical directions for the modelled array signature (a 160 in^3 seismic source) as shown in Table 35.

Marine mammals:

Marine mammal injury criteria, from NMFS (2024), requires two metrics (PK and SEL_{24h}) to be considered for impulsive noise when assessing marine mammal PTS and TTS with the longest distance associated with either metric required to be applied. In this study, the longest horizontal

distances to the low–frequency cetacean PTS and TTS thresholds were associated with the SEL24h metric (0.02 km and 2.00 km, respectively), while the longest horizontal distances to the very–high–frequency cetacean PTS and TTS thresholds were associated with the PK metric (0.03 km and 0.05 km, respectively).

The maximum distance to the NOAA (2024) marine mammal behavioural response criterion of 160 dB re 1 µPa (SPL) was 1.48 km.

Sea turtles:

For sea turtles, the SEL_{24h} thresholds of 189 dB re 1 μPa^2s for TTS and 204 dB re 1 μPa^2s for PTS were not reached within the modelling resolution limit of 20 m (Finneran et al. 2017).

The PK sea turtle injury criteria of 226 dB re 1 µPa for TTS and 232 dB re 1 µPa for PTS from Finneran et al. (2017) were also not exceeded at a distance longer than 20 m from the acoustic centre of the source.

The maximum distances to the behavioural response criteria for sea turtles of 166 dB re 1 µPa (SPL) and the 175 dB re 1 µPa (SPL) threshold for behavioural disturbance were 0.70 km and 0.17 km, respectively for the 160 in^3 seismic source (McCauley et al. 2000).

Fish, fish eggs, and fish larvae:

The effects of sound exposure on fish were considered in relation to both PK and SEL_{24h} metrics associated with mortality, potential mortal injury and impairment, based on quantitative criteria from Popper et al. (2014) for the following groups:

- Fish without a swim bladder (also appropriate for sharks in the absence of other information),
- Fish with a swim bladder that do not use it for hearing,
- Fish that use their swim bladders for hearing, and
- Fish eggs and fish larvae.

Table 47 summarises the maximum distances to effect criteria for fish, fish eggs, and fish larvae along with the relevant metric across all three modelled locations. The PK metric thresholds for fish were not exceed in this modelling.

Table 47. Summary of maximum fish, fish eggs, and larvae injury and temporary threshold shift (TTS) onset distances for the modelled seismic survey, for single impulse and 24 h sound exposure level (SEL_{24h}).

Relevant hearing group	Effect criteria	Water column	
		Metric associated with longest distance to criteria	R_{max} (km)
Fish: No swim bladder	Recoverable injury	–	–
	TTS	SEL_{24h}	0.10
Fish: Swim bladder not involved in hearing and Swim bladder involved in hearing	Recoverable injury	SEL_{24h}	–
	TTS	SEL_{24h}	0.10
Fish eggs, and larvae	Injury	SEL_{24h}	–

A dash indicates the threshold was not reached within the limits of the modelling resolution (20 m).

Benthic invertebrates:

To assist with assessing the potential effects on crustaceans from seismic surveying operations, the following results were determined:

- The sound level of 202 dB re 1 µPa PK–PK from Payne et al. (2008), which is representative of no effects, was considered for seafloor sound levels; the sound level was reached at 3.6 m from the acoustic centre within a water depth of 66.7 m.
- Sound levels of 209–212dB re 1 µPa PK–PK from Day et al. (2016b) and 213 dB re 1 µPa from Day et al. (2016a), which are related to impairment in crustaceans, was considered; these levels were not reached (Table 48).

Table 48. Maximum (R_{max}) horizontal distances (in m) from the seismic source to modelled seafloor (receiver located 5 cm above seafloor) peak–peak pressure levels (PK–PK) within the modelling area. Results included in relation to benthic invertebrates.

PK–PK (L_{pk-pk}; dB re 1 µPa)	Distance R_{max} (m)
	Receiver Depth: 66.65 m
213[1,2,3]	*
212[2,3]	*
210[1,2]	*
209[1,2]	*
202[4]	3.6

[1] Day et al. (2019), lobster
[2] Day et al. (2016a), lobster and scallops
[3] Day et al. (2017), scallops.
[4] Payne et al. (2008), lobster
An asterisk indicates that the sound level was not reached.

5.4. Conclusion

This modelling study predicted underwater sound levels associated with Emperor Energy's activities and operations at the Judith-2 exploration site. The modelling study predicted the distances from

operations at which underwater sound levels reached noise effect thresholds and criteria for marine mammals, sea turtles and fish.

The greatest horizontal distances were associated with vessel and drilling scenario 1 – prelay and anchor setup up activity, which involved three AHTS vessels. Two AHTSs were modelled on slow transit to represent prelay activities and the third AHTS was modelled under dynamic positioning (DP) during anchor hookup operations. The AHTS on DP was the most dominant source within the scenario. In all modelling scenarios, the combination of source level and source location contributes to each scenario's resulting horizontal distance to effect thresholds.

The VSP modelling results demonstrated that the longest horizontal distances to the low–frequency cetacean PTS and TTS thresholds were associated with the SEL_{24h} metric for the modelled scenario with 300 shots (0.85 km and 4.82 km, respectively), while the longest horizontal distances to the very–high–frequency cetacean PTS and TTS thresholds were associated with the PK metric (0.07 km and 0.28 km, respectively). The maximum distance to the 160 dB re 1 µPa (SPL) marine mammal behavioural response criterion was 2.82 km. For sea turtles, behavioural disturbance could occur up to 0.54 km from the VSP acoustic centre, and the PTS and TTS injury criteria was not exceeded at a distance longer than 20 m from the acoustic centre of the source. All effect zones for fish recoverable injury were less than 60 m and for TTS was 1.07 km. Crustaceans may be affected within 184.4 m of the VSP centre.

Finally, the 2D seismic survey as modelled as a single source array towed on survey lines within a 1×1 km^2 area centred on the well centre location. The 2D seismic survey modelling results demonstrated that the longest horizontal distances to the low–frequency cetacean PTS and TTS thresholds were 0.02 km and 2.00 km, respectively. The maximum distance to the 160 dB re 1 µPa (SPL) marine mammal behavioural response criterion was 1.48 km. For sea turtles, behavioural disturbance could occur up to 0.17 km, and the PTS and TTS injury criteria was not exceeded at a distance longer than 20 m from the acoustic centre of the source. All effect zones for fish recoverable injury were less than 0.02 km and for TTS was 0.10 km. Crustaceans are not affected by the source and the sound level of 202 dB re 1 µPa PK–PK was reached at 3.6 m at water depth 66.65 m from the acoustic centre.

Glossary

Unless otherwise stated in an entry, these definitions are consistent with ISO 18405 (2017).

1/3-octave

One third of an octave. *Note*: A 1/3-octave is approximately equal to one decidecade (1/3 oct ≈ 1.003 ddec).

absorption

The conversion of sound energy to heat energy. Specifically, the reduction of sound pressure amplitude due to particle motion energy converting to heat in the propagation medium.

acoustic noise

Sound that interferes with an acoustic process.

acoustic self-noise

Sound at a receiver caused by the deployment, operation, or recovery of a specified receiver, and its associated platform (ISO 18405:2017).

agent-based modelling

A computer simulation of autonomous agents (sometimes called animats) acting in an environment, used to assess the agents' experience of the environment and/or their effect on the environment. See also animal movement modelling.

ambient sound

Sound that would be present in the absence of a specified activity (ISO 18405:2017). It is usually a composite of sound from many sources near and far, e.g., shipping vessels, seismic activity, precipitation, sea ice movement, wave action, and biological activity.

animal movement modelling

Simulation of animal movement based on behavioural rules for the purpose of predicting an animal's experience of an environment. A type of agent-based modelling.

attenuation

The gradual loss of acoustic energy from absorption and scattering as sound propagates through a medium. Attenuation depends on frequency—higher frequency sounds are attenuated faster than lower frequency sounds.

audiogram

A graph or table of hearing threshold as a function of frequency that describes the hearing sensitivity of an animal over its hearing range.

auditory frequency weighting

The process of applying an auditory frequency-weighting function. An example for marine mammals are the auditory frequency-weighting functions published by Southall et al. (2007b).

auditory frequency-weighting function

Frequency-weighting function describing a compensatory approach accounting for a species' (or functional hearing group's) frequency-specific hearing sensitivity.

background noise

Combination of ambient sound, acoustic self-noise, and, where applicable, sonar reverberation (ISO 18405:2017) that is detected, measured, or recorded with a signal.

bandwidth

A range within a continuous band of frequencies. Unit: hertz (Hz).

broadband level

The total level measured over a specified frequency range. If the frequency range is unspecified, the term refers to the entire measured frequency range.

cavitation

A rapid formation and collapse of vapor cavities (i.e., bubbles or voids) in water, most often caused by a rapid change in pressure. Fast-spinning vessel propellers typically cause cavitation, which creates a lot of noise.

cetacean

Member of the order Cetacea. Cetaceans are aquatic mammals and include whales, dolphins, and porpoises.

compressional wave

A mechanical vibration wave in which the direction of particle motion is parallel to the direction of propagation. Also called a longitudinal wave. In seismology/geophysics, it's called a primary wave or P-wave. Shear waves in the seabed can be converted to compressional waves in water at the water-seabed interface.

conductivity-temperature-depth (CTD)

Measurement data of the ocean's conductivity, temperature, and depth; used to compute sound speed profiles and salinity.

continuous sound

A sound whose sound pressure level remains above the background noise during the observation period and may gradually vary in intensity with time, e.g., sound from a marine vessel.

critical band

The auditory bandwidth within which background noise strongly contributes to masking of a single tone. Unit: hertz (Hz).

critical ratio level

The difference between the sound pressure level of a masked tone, which is barely audible, and the spectral density level of the background noise at similar frequencies, referenced to 1 Hz. Unit: decibel (dB).

decade

Logarithmic frequency interval whose upper bound is ten times larger than its lower bound (ISO 80000-3:2006). For example, one decade up from 1000 Hz is 10,000 Hz, and one decade down is 100 Hz.

decibel (dB)

Unit of level used to express the ratio of one value of a power quantity to another on a logarithmic scale. Especially suited to quantify variables with a large dynamic range.

decidecade

One tenth of a decade. Approximately equal to one third of an octave (1 ddec ≈ 0.3322 oct), and for this reason sometimes referred to as a 1/3-octave.

decidecade band

Frequency band whose bandwidth is one decidecade. *Note*: The bandwidth of a decidecade band increases with increasing centre frequency.

delphinid

Member of the family of oceanic dolphins (Delphinidae), composed of approximately 35 extant species, including dolphins, porpoises, and killer whales.

energy source level

A property of a sound source equal to the sound exposure level measured in the far field plus the propagation loss from the acoustic centre of the source to the receiver position. Unit: decibel (dB). Reference value: 1 $\mu Pa^2\,m^2\,s$.

ensonified

Exposed to sound.

equal-loudness-level contour

Curve that shows, as a function of frequency, the sound pressure level required to produce a given loudness for a listener having normal hearing, listening to a specified kind of sound in a specified manner (ANSI S1.1-2013).

far field

The zone where, to an observer, sound originating from an array of sources (or a spatially distributed source) appears to radiate from a single point.

frequency

The rate of oscillation of a periodic function measured in cycles per unit time. The reciprocal of the period. Unit: hertz (Hz). Symbol: f. 1 Hz is equal to 1 cycle per second.

frequency weighting

The process of applying a frequency-weighting function.

frequency-weighting function

The squared magnitude of the sound pressure transfer function (ISO 18405:2017). For sound of a given frequency, the frequency-weighting function is the ratio of output power to input power of a specified filter, sometimes expressed in decibels. Examples include the following:

- *Auditory frequency-weighting function*: compensatory frequency-weighting function accounting for a species' (or functional hearing group's) frequency-specific hearing sensitivity.
- *System frequency-weighting function*: frequency-weighting function describing the sensitivity of an acoustic recording system, which typically consists of a hydrophone, one or more amplifiers, and an analog-to-digital converter.

functional hearing group

Category of animal species when classified according to their hearing sensitivity, hearing anatomy, and susceptibility to sound. For marine mammals, initial groupings were proposed by Southall et al. (2007b), and revised groupings are developed as new research/data becomes available. Revised groupings proposed by Southall et al. (2019) and NMFS (2024) include low-frequency cetaceans, high-frequency cetaceans, very high-frequency cetaceans, phocid carnivores in water, other carnivores in water, and sirenians. See auditory frequency-weighting functions, which are often applied to these groups. Example hearing groups for fish include species for which the swim bladder is involved in hearing, species for which the swim bladder is not involved in hearing, and species without a swim bladder (Popper et al. 2014).

geoacoustic

Relating to the acoustic properties of the seabed.

harmonic

A sinusoidal sound component that has a frequency that is an integer multiple of the frequency of a sound to which it is related. For a sound with a fundamental frequency of f, the harmonics have frequencies of $2f$, $3f$, $4f$, etc.

hearing threshold

For a given species or functional hearing group, the sound level for a given signal that is barely audible (i.e., that would be barely audible for a given individual in the presence of specified background noise during a specific percentage of experimental trials).

hertz (Hz)

Unit of frequency defined as one cycle per second. Often expressed in multiples such as kilohertz (1 kHz = 1000 Hz).

high-frequency (HF) cetaceans

See functional hearing group. *Note*: The mid- and high-frequency cetaceans groups proposed by Southall et al. (2007b) were renamed high- and very-high-frequency cetaceans, respectively, by Southall et al. (2019) and NMFS (2024).

hydrophone

An underwater sound pressure transducer. A passive electronic device for recording or listening to underwater sound.

hydrostatic pressure

The pressure at any given depth in a static liquid that is the result of the weight of the liquid acting on a unit area at that depth, plus any pressure acting on the surface of the liquid. Unit: pascal (Pa).

impulsive sound

Qualitative term meaning sounds that are typically transient, brief (less than 1 s), broadband, with rapid rise time and rapid decay. They can occur in repetition or as a single event. Sources of impulsive sound include, among others, explosives, seismic airguns, and impact pile drivers.

isopleth

A line drawn on a map through all points having the same value of some specified quantity (e.g., sound pressure level isopleth).

knot (kn)

Unit of vessel speed equal to 1 nautical mile per hour.

level

A measure of a quantity expressed as the logarithm of the ratio of the quantity to a specified reference value of that quantity. For example, a value of sound pressure level with reference to 1 μPa^2 can be written in the form *x* dB re 1 μPa^2.

low-frequency (LF) cetaceans

See functional hearing group.

masking

Obscuring of sounds of interest by other sounds at similar frequencies.

median

The 50th percentile of a statistical distribution.

mid-frequency (MF) cetaceans

See functional hearing group. *Note*: The mid-frequency cetaceans group proposed by Southall et al. (2007b) was renamed high-frequency cetaceans by Southall et al. (2019) and NMFS (2024).

monopole source level (MSL)

A source level that has been calculated using an acoustic model that accounts for the effect of the sea-surface and seabed on sound propagation, assuming a point source (monopole). Often used to quantify source levels of vessels or industrial operations from measurements. See also radiated noise level.

Monte Carlo simulation

A method of investigating the distribution of a non-linear multi-variate function by random sampling of its input variable distributions.

multiple linear regression

A statistical method that seeks to explain the response of a dependent variable using multiple explanatory variables.

M-weighting

A set of auditory frequency-weighting functions proposed by Southall et al. (2007b).

mysticete

Member of the Mysticeti, a suborder of cetaceans. Also known as baleen whales, mysticetes have baleen plates (rather than teeth) that they use to filter food from water (or from sediment as for grey whales). This group includes rorquals (Balaenopteridae, such as blue, fin, humpback, and minke whales), right and bowhead whales (Balaenidae), and grey whales (*Eschrichtius robustus*).

***N* percent exceedance level**

The sound level exceeded *N* % of the time during a specified time interval. See also percentile level.

non-impulsive sound

Sound that is not an impulsive sound. Not necessarily a continuous sound.

octave

The interval between a sound and another sound with double or half the frequency. For example, one octave above 200 Hz is 400 Hz, and one octave below 200 Hz is 100 Hz.

odontocete

Member of Odontoceti, a suborder of cetaceans. These whales, dolphins, and porpoises have teeth (rather than baleen plates). Their skulls are mostly asymmetric, an adaptation for their echolocation. This group includes sperm whales, killer whales, belugas, narwhals, dolphins, and porpoises.

otariid

Member of the family Otariidae, one of the three groupings of pinnipeds (along with phocids and walrus). These eared seals, commonly called fur seals and sea lions, are adapted to semi-aquatic life; they use their large fore flippers for propulsion underwater and can walk on all four limbs on land.

otariid pinnipeds underwater (OW)

See functional hearing group.

other marine carnivores in water (OCW)

See functional hearing group.

parabolic equation method

A computationally efficient solution to the acoustic wave equation that is used to model propagation loss. The parabolic equation approximation omits effects of backscattered sound (which are negligible for most ocean-acoustic propagation problems), simplifying the computation of propagation loss.

particle acceleration, particle displacement, particle motion, particle velocity

See sound particle acceleration, sound particle displacement, sound particle motion, sound particle velocity.

peak sound pressure level (PK), zero-to-peak sound pressure level

The level (L_{pk}) of the squared maximum magnitude of the sound pressure (p_{pk}^2) in a stated frequency band and time window. Defined as $L_{\mathrm{pk}} = 10log_{10}(p_{\mathrm{pk}}^2/p_0^2) = 20log_{10}(p_{pk}/p_0)$. Unit: decibel (dB). Reference value (p_0^2) for sound in water: 1 μPa^2.

peak-to-peak sound pressure

The difference between the maximum and minimum sound pressure over a specified frequency band and time window. Unit: pascal (Pa).

percentile level

The sound level not exceeded *N* % of the time during a specified time interval. The *N*th percentile level is equal to the (100−*N*) % exceedance level. See also N percent exceedance level.

permanent threshold shift (PTS)

An irreversible loss of hearing sensitivity caused by excessive noise exposure. Considered auditory injury. Compare with temporary threshold shift.

phocid

Member of the family Phocidae, one of the three groupings of pinnipeds (along with otariids and walrus). These true/earless seals are more adapted to in-water life than are otariids, which have more terrestrial adaptations. Phocids use their hind flippers to propel themselves underwater.

phocid pinnipeds underwater (PW), phocid carnivores in water (PCW)

See functional hearing group.

pinniped

Member of the superfamily Pinnipedia, which is composed of phocids (true seals or earless seals), otariids (eared seals or fur seals and sea lions), and walrus.

point source

A source that radiates sound as if from a single point.

propagation loss (PL)

Difference between a source level (SL) and the level at a specified location, $\mathrm{PL}(x) = \mathrm{SL} - L(x)$. Unit: decibel (dB). See also transmission loss.

radiated noise level (RNL)

A source level that has been calculated assuming sound pressure decays geometrically with distance from the source, with no influence of the sea-surface or seabed. Often used to quantify source levels of vessels or industrial operations from measurements. See also monopole source level.

received level

The level of a given field variable measured (or that would be measured) at a given location.

reference value

Standard value of a quantity used for calculating underwater sound level. The reference value depends on the quantity for which the level is being calculated:

Quantity	Reference value
Sound pressure	p_0^2 = 1 μPa^2 or p_0 = 1 μPa
Sound exposure	E_0 = 1 μPa^2 s
Sound particle displacement	δ_0^2 = 1 pm^2
Sound particle velocity	u_0^2 = 1 nm^2/s^2
Sound particle acceleration	a_0^2 = 1 μm^2/s^4

sensation level

Difference between the sound pressure level and hearing threshold at a specified frequency. Unit: decibel (dB).

shear wave

A mechanical vibration wave in which the direction of particle motion is perpendicular to the direction of propagation. Also called a secondary wave or S-wave. Shear waves propagate only in solid media, such as sediments or rock. Shear waves in the seabed can be converted to compressional waves in water at the water-seabed interface.

sirenians (SI)

Members of the order Sirenia, which includes several manatee species and the dugong. See also functional hearing group.

sound

A time-varying disturbance in the pressure, stress, or material displacement of a medium propagated by local compression and expansion of the medium. In common meaning, a form of energy that propagates through media (e.g., water, air, ground) as pressure waves.

sound exposure

Time integral of squared sound pressure over a stated time interval in a stated frequency band. The time interval can be a specified time duration (e.g., 24 h) or from start to end of a specified event (e.g., a pile strike, an airgun pulse, a construction operation). Unit: pascal squared second (Pa^2 s). Symbol: E.

sound exposure level (SEL)

The level (L_E) of the sound exposure (E) in a stated frequency band and time window: $L_E = 10\log_{10}(E/E_0)$ (ISO 18405:2017). Unit: decibel (dB). Reference value (E_0) for sound in water: 1 μPa^2 s.

sound exposure spectral density

Distribution as a function of frequency of the time-integrated squared sound pressure per unit bandwidth of a sound having a continuous spectrum (ISO 18405:2017). Unit: pascal squared second per hertz (Pa^2 s/Hz).

sound field

Region containing sound waves.

sound intensity

Product of the sound pressure and the sound particle velocity (ISO 18405:2017). The magnitude of the sound intensity is the sound energy flowing through a unit area perpendicular to the direction of propagation per unit time. Unit: watt per metre squared (W/m^2). Symbol: I.

sound particle acceleration

The rate of change of sound particle velocity. Unit: metre per second squared (m/s^2). Symbol: a.

sound particle motion

Movement caused by the action of sound of the smallest volume of a medium that represents its mean physical properties. Important for determining effects of underwater noise on fishes and invertebrates because their hearing organs sense particle motion rather than sound pressure.

sound particle displacement

Displacement of a material element caused by the action of sound, where a material element is the smallest element of the medium that represents the medium's mean density (ISO 18405:2017). Unit: metre (m). Symbol: δ.

sound particle velocity

The velocity of a particle in a material moving back and forth in the direction of the pressure wave. Unit: metre per second (m/s). Symbol: u.

sound pressure

The contribution to total pressure caused by the action of sound (ISO 18405:2017). Unit: pascal (Pa). Symbol: p.

sound pressure level (SPL), rms sound pressure level

The level (L_p) of the time-mean-square sound pressure (p_{rms}^2) in a stated frequency band and time window: $L_p = 10\log_{10}(p_{\mathrm{rms}}^2/p_0^2) = 20\log_{10}(p_{rms}/p_0)$, where rms is the abbreviation for root-mean-square. Unit: decibel (dB). Reference value (p_0^2) for sound in water: 1 μPa^2. SPL can also be expressed in terms of the root-mean-square (rms) with a reference value of p_0 = 1 μPa. The two definitions are equivalent.

sound speed profile

The speed of sound in the water column as a function of depth below the water surface.

soundscape

The characterization of the ambient sound in terms of its spatial, temporal, and frequency attributes, and the types of sources contributing to the sound field (ISO 18405:2017).

source level (SL)

A property of a sound source equal to the sound pressure level measured in the far field plus the propagation loss from the acoustic centre of the source to the receiver position. Unit: decibel (dB). Reference value: 1 μPa^2 m^2.

spectrogram

A visual representation of acoustic amplitude over time and frequency. A spectrogram's resolution in the time and frequency domains should generally be stated as it determines the information content of the representation.

spectrum

Distribution of acoustic signal content over frequency, where the signal's content is represented by its power, energy, mean-square sound pressure, or sound exposure.

surface duct

The upper portion of a water column within which the gradient of the sound speed profile causes sound to refract upward and therefore reflect repeatedly off the surface resulting in relatively long-range sound propagation with little loss.

temporary threshold shift (TTS)

Reversible loss of hearing sensitivity caused by noise exposure. Compare with permanent threshold shift.

thermocline

A depth interval near the ocean surface that experiences larger temperature gradients than the layers above and below it due to warming or cooling by heat conduction from the atmosphere and by warming from the sun.

transmission loss (TL)

The difference between a specified level at one location and that at a different location: $\mathrm{TL}(x_1,x_2) = L(x_1) - L(x_2)$ (ISO 18405:2017). Unit: decibel (dB). See also propagation loss.

unweighted

Term indicating that no frequency-weighting function is applied.

very high-frequency (VHF) cetaceans

See functional hearing group.

wavelength

Distance over which a wave completes one cycle of oscillation. Unit: metre (m). Symbol: λ.

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Appendix A. Acoustic Metrics

This section describes in detail the acoustic metrics, impact criteria, and frequency weighting relevant to the modelling study.

A.1. Pressure Related Acoustic Metrics

Underwater sound pressure amplitude is measured in decibels (dB) relative to a fixed reference pressure of p_0 = 1 µPa. Because the perceived loudness of sound, especially pulsed sound such as from seismic airguns, pile driving, and sonar, is not generally proportional to the instantaneous acoustic pressure, several sound level metrics are commonly used to evaluate sound and its effects on marine life. Here we provide specific definitions of relevant metrics used in the accompanying report. Where possible, we follow International Organization for Standardization definitions and symbols for sound metrics (e.g., ISO 2017, ANSI S1.1-2013).

The zero-to-peak sound pressure, or peak sound pressure (PK or $L_{p,pk}$; dB re 1 µPa), is the decibel level of the maximum instantaneous acoustic pressure in a stated frequency band attained by an acoustic pressure signal, $\mathrm{p(t)}$:

$$L_{p,\mathrm{pk}} = 10\log_{10}\frac{\max|p^2(t)|}{p_0^2} = 20\log_{10}\frac{\max|p(t)|}{p_0} \tag{A-1}$$

PK is often included as a criterion for assessing whether a sound is potentially injurious; however, because it does not account for the duration of an acoustic event, it is generally a poor indicator of perceived loudness.

The peak-to-peak sound pressure (PK-PK or $L_{p,pk\text{-}pk}$; dB re 1 µPa) is the difference between the maximum and minimum instantaneous sound pressure, possibly filtered in a stated frequency band, attained by an impulsive sound, $\mathrm{p(t)}$:

$$L_{p,\mathrm{pk\text{-}pk}} = 10\log_{10}\frac{[\max(p(t)) - \min(p(t))]^2}{p_0^2} \tag{A-2}$$

The sound pressure level (SPL or L_p; dB re 1 µPa) is the root-mean-square (rms) pressure level in a stated frequency band over a specified time window (T; s). It is important to note that SPL always refers to an rms pressure level and therefore not instantaneous pressure:

$$L_p = 10\log_{10}\left(\frac{1}{T}\int_T g(t)\,p^2(t)\,dt \Big/ p_0^2\right) \tag{A-3}$$

where $\mathrm{g(t)}$ is an optional time weighting function. In many cases, the start time of the integration is marched forward in small time steps to produce a time-varying SPL function. For short acoustic events, such as sonar pulses and marine mammal vocalizations, it is important to choose an appropriate time window that matches the duration of the signal. For in-air studies, when evaluating the perceived loudness of sounds with rapid amplitude variations in time, the time weighting function $\mathrm{g(t)}$ is often set to a decaying exponential function that emphasizes more recent pressure signals. This function mimics the leaky integration nature of mammalian hearing. For example, human-based fast time-weighted SPL ($L_{p,fast}$) applies an exponential function with time constant 125 ms. A related simpler approach used in underwater acoustics sets $\mathrm{g(t)}$ to a boxcar (unity amplitude) function of width 125 ms; the results can be referred to as $L_{p,boxcar\ 125ms}$. Another approach, historically used to evaluate SPL of impulsive signals underwater, defines $\mathrm{g(t)}$ as a boxcar function with edges set to the times corresponding to 5% and 95% of the cumulative square pressure function encompassing the

duration of an impulsive acoustic event. This calculation is applied individually to each impulse signal, and the results are referred to as 90% SPL ($L_{p,90\%}$).

The sound exposure level (SEL or L_E; dB re 1 µPa²·s) is the time-integral of the squared acoustic pressure over a duration (T):

$$L_E = 10 \log_{10} \left(\int_T p^2(t)\, dt \Big/ T_0 p_0^2 \right) \quad \text{(A-4)}$$

where T_0 is a reference time interval of 1 s. SEL continues to increase with time when non-zero pressure signals are present. It is a dose-type measurement, so the integration time applied must be carefully considered for its relevance to impact to the exposed recipients.

SEL can be calculated over a fixed duration, such as the time of a single event or a period with multiple acoustic events. When applied to pulsed sounds, SEL can be calculated by summing the SEL of the N individual pulses. For a fixed duration, the square pressure is integrated over the duration of interest. For multiple events, the SEL can be computed by summing (in linear units) the SEL of the N individual events:

$$L_{E,N} = 10 \log_{10} \sum_{i=1}^{N} 10^{\frac{L_{E,i}}{10}} \quad \text{(A-5)}$$

If applied, the frequency weighting of an acoustic event should be specified, as in the case of weighted SEL (e.g., $L_{E,LF,24h}$; see Appendix A.4) or auditory-weighted SPL ($L_{p,ht}$). The use of fast, slow, or impulse exponential-time-averaging or other time-related characteristics should also be specified.

A.2. Decidecade Band Analysis

The distribution of a sound's power with frequency is described by the sound's spectrum. The sound spectrum can be split into a series of adjacent frequency bands. Splitting a spectrum into 1 Hz wide bands, called passbands, yields the power spectral density of the sound. This splitting of the spectrum into passbands of a constant width of 1 Hz, however, does not represent how animals perceive sound.

Because animals perceive exponential increases in frequency rather than linear increases, analysing a sound spectrum with passbands that increase exponentially in size better approximates real–world scenarios. In underwater acoustics, a spectrum is commonly split into decidecade bands, which are one tenth of a decade wide. A decidecade is sometimes referred to as a "1/3 octave" because one tenth of a decade is approximately equal to one third of an octave. Each decade represents a factor 10 in sound frequency. Each octave represents a factor 2 in sound frequency. The centre frequency of the ith band, $f_c(i)$, is defined as:

$$f_c(i) = 10^{\frac{i}{10}} \text{ kHz} \quad \text{(A–6)}$$

and the low (f_{lo}) and high (f_{hi}) frequency limits of the ith decade band are defined as:

$$f_{lo,i} = 10^{\frac{-1}{20}} f_c(i) \quad \text{and} \quad f_{hi,i} = 10^{\frac{1}{20}} f_c(i) \quad \text{(A–7)}$$

The decidecade bands become wider with increasing frequency, and on a logarithmic scale the bands appear equally spaced (Figure A–1). The acoustic modelling spans from band 10 (f_c (10) = 10 Hz) to band 44 ($f_c(44)$ = 25 kHz).

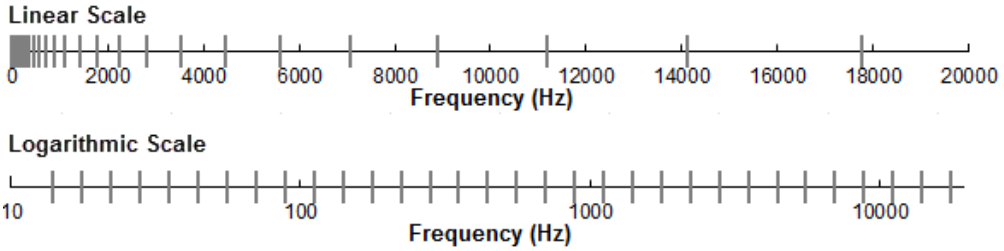


Figure A–1. Decidecade frequency bands (vertical lines) shown on a linear frequency scale and a logarithmic scale.

The sound pressure level in the ith band ($L_{p,i}$) is computed from the spectrum $S(f)$ between $f_{\text{lo},i}$ and $f_{\text{hi},i}$:

$$L_{p,i} = 10\,log_{10} \int_{f_{\text{lo},i}}^{f_{\text{hi},i}} S(f)\,\text{d}f \;\text{dB} \tag{A–8}$$

Summing the sound pressure level of all the bands yields the broadband sound pressure level:

$$\text{Broadband SPL} = 10 \log_{10} \sum_i 10^{\frac{L_{p,i}}{10}} \;\text{dB} \tag{A–9}$$

Figure A–2 shows an example of how the decidecade band sound pressure levels compare to the sound pressure spectral density levels of an ambient sound signal. Because the decidecade bands are wider than 1 Hz, the decidecade band SPL is higher than the spectral levels at higher frequencies. Acoustic modelling of decidecade bands requires less computation time than 1 Hz bands and still resolves the frequency–dependence of the sound source and the propagation environment.

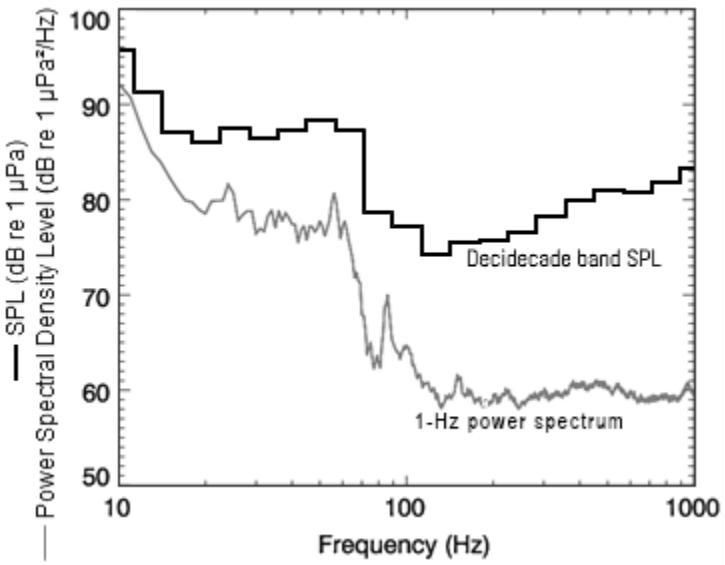


Figure A–2. Sound pressure spectral density levels and the corresponding decidecade band sound pressure levels of example ambient noise shown on a logarithmic frequency scale.Because the decidecade bands are wider with increasing frequency, the decidecade band SPL is higher than the power spectrum.

A.3. Marine Mammal Noise Effect Criteria

It has been long recognised that marine mammals can be adversely affected by underwater anthropogenic noise. For example, Payne and Webb (1971) suggest that communication distances of fin whales are reduced by shipping sounds. Subsequently, similar concerns arose regarding effects of other underwater noise sources and the possibility that impulsive sources—primarily airguns used in seismic surveys—could cause auditory injury. This led to a series of workshops held in the late 1990s, conducted to address acoustic mitigation requirements for seismic surveys and other underwater noise sources (NMFS 1998, ONR 1998, Nedwell and Turnpenny 1998, HESS 1999, Ellison and Stein 1999). In the years since these early workshops, a variety of thresholds have been proposed for auditory injury, impairment, and disturbance. The following sections summarise the recent development of thresholds; however, this field remains an active research topic.

A.3.1. Injury and Hearing Sensitivity Changes

In recognition of shortcomings of the SPL–only based auditory injury criteria, in 2005 NMFS sponsored the Noise Criteria Group to review literature on marine mammal hearing to propose new noise exposure criteria. Some members of this expert group published a landmark paper (Southall et al. 2007b) that suggested assessment methods similar to those applied for humans. The resulting recommendations introduced dual auditory injury criteria for impulsive sounds that included peak pressure level thresholds and SEL_{24h} thresholds, where the subscripted 24h refers to the accumulation period for calculating SEL. The peak pressure level criterion is not frequency weighted whereas SEL_{24h} is frequency weighted according to one of four marine mammal species hearing groups: low–, mid– and high–frequency cetaceans (LF, MF, and HF cetaceans, respectively) and Pinnipeds in Water (PINN). These weighting functions are referred to as M–weighting filters (analogous to the A–weighting filter for humans; see Appendix A.4). The SEL_{24h} thresholds were obtained by extrapolating measurements of onset levels of Temporary Threshold Shift (TTS) in belugas by the amount of TTS required to produce Permanent Threshold Shift (PTS) in chinchillas. The Southall et al. (2007b) recommendations do not specify an exchange rate, which suggests that the thresholds are the same regardless of the duration of exposure (i.e., it implies a 3 dB exchange rate).

Wood et al. (2012) refined NMFS (2024) et al.'s (2007b) thresholds, suggesting lower PTS and TTS values for LF and HF cetaceans while retaining the filter shapes. Their revised thresholds were based on TTS–onset levels in harbour porpoises from Lucke et al. (2009), which led to a revised impulsive sound PTS threshold for HF cetaceans of 179 dB re 1 $\mu Pa^2 \cdot s$. Because there were no data available for baleen whales, Wood et al. (2012) based their recommendations for LF cetaceans on results obtained from MF cetacean studies. In particular they referenced the Finneran and Schlundt (2010) research, which found mid–frequency cetaceans are more sensitive to non–impulsive sound exposure than Southall et al. (2007b) assumed. Wood et al. (2012) thus recommended a more conservative TTS–onset level for LF cetaceans of 192 dB re 1 $\mu Pa^2 \cdot s$.

As of present, a definitive approach is still not apparent. There is consensus in the research community that an SEL–based method is preferable, either separately or in addition to an SPL–based approach to assess the potential for injuries. In August 2016, after substantial public and expert input into three draft versions and based largely on the above–mentioned literature (NOAA 2013, 2015, 2016), NMFS finalised technical guidance for assessing the effect of anthropogenic sound on marine mammal hearing (NMFS 2016). The guidance describes auditory injury criteria with new thresholds and frequency weighting functions for the five hearing groups described by Finneran and Jenkins (2012). The latest revision to this work was published in 2024 (NMFS 2024).

A.3.2. Behavioural Response

Numerous studies on marine mammal behavioural responses to sound exposure have not resulted in consensus in the scientific community regarding the appropriate metric for assessing behavioural reactions. However, it is recognised that the context in which the sound is received affects the nature and extent of responses to a stimulus (Southall et al. 2007b, Ellison and Frankel 2012, Southall et al. 2016).

For impulsive noise, NMFS currently uses a step function threshold of 160 dB re 1 µPa SPL (unweighted) to assess and regulate noise–induced behavioural impacts for marine mammals (NOAA 2018, NOAA 2024). The threshold for impulsive sound is derived from the High–Energy Seismic Survey (HESS) panel (HESS 1999) report that, in turn, is based on the responses of migrating mysticete whales to airgun sounds (Malme et al. 1984). The HESS team recognised that behavioural responses to sound may occur at lower levels, but significant responses were only likely to occur above a SPL of 140 dB re 1 µPa. Southall et al. (2007a) found varying responses for most marine mammals between a SPL of 140 and 180 dB re 1 µPa, consistent with the HESS (1999) report, but lack of convergence in the data prevented them from suggesting explicit step functions.

NMFS currently uses a step function (all–or–none) threshold of 120 dB re 1 µPa SPL (unweighted) for non–impulsive sounds to assess and regulate noise–induced behavioural impacts on marine mammals (NOAA (2024)). The 120 dB re 1 µPa threshold is associated with continuous sources and was derived based on studies examining behavioural responses to drilling and dredging (NOAA 2018), referring to Malme et al. (1983), Malme et al. (1984), and Malme et al. (1986), which were considered in Southall et al. (2007b). Malme et al. (1986) found that playback of drillship noise did not produce clear evidence of disturbance or avoidance for levels below 110 dB re 1 µPa (SPL), possible avoidance occurred for exposure levels approaching 119 dB re 1 µPa. Malme et al. (1984) determined that measurable reactions usually consisted of rather subtle short–term changes in speed and/or heading of the whale(s) under observation. It has been shown that both received level and proximity of the sound source is a contributing factor in eliciting behavioural reactions in humpback whales (Dunlop et al. 2017, Dunlop et al. 2018).

A.4. Marine Mammal Frequency Weighting

The potential for noise to affect animals depends on how well the animals can hear it. Noises are less likely to disturb or injure an animal if they are at frequencies that the animal cannot hear well. An exception occurs when the sound pressure is so high that it can physically injure an animal by non–auditory means (i.e., barotrauma). For sound levels below such extremes, the importance of sound components at particular frequencies can be scaled by frequency weighting relevant to an animal's sensitivity to those frequencies (Nedwell and Turnpenny 1998, Nedwell et al. 2007).

A.4.1. Marine Mammal Frequency Weighting Functions

In 2015, a US Navy technical report by Finneran (2015) recommended new auditory weighting functions. The overall shape of the auditory weighting functions is similar to human A–weighting functions, which follows the sensitivity of the human ear at low sound levels. The new frequency–weighting function is expressed as:

$$G(f) = K + 10\log_{10}\left[\left(\frac{(f/f_{lo})^{2a}}{\left[1+(f/f_{lo})^{2}\right]^{a}\left[1+(f/f_{hi})^{2}\right]^{b}}\right)\right] \qquad \text{(A–10)}$$

Finneran (2015) proposed five functional hearing groups for marine mammals in water: low–, mid– and high–frequency cetaceans (LF, MF, and HF cetaceans, respectively), phocid pinnipeds, and otariid pinnipeds. The parameters for these frequency–weighting functions were further modified the following year (Finneran 2016) and were adopted in NOAA's technical guidance that assesses acoustic impacts on marine mammals (NMFS 2018), and in the latest guidance by NMFS (2024). The updates did not affect the content related to either the definitions of frequency–weighting functions or the threshold values, however, the terminology for mid– and high–frequency cetaceans was changed to high– and very high–frequency cetaceans (VHF cetaceans). Table A–1. lists the frequency–weighting parameters for each hearing group relevant to this assessment, and Figure A–3 shows the resulting frequency–weighting curves.

Table A–1. Parameters for the auditory weighting functions used in this project as recommended by NMFS (2024).

Functional hearing group	NMFS (2024)				
	a	b	f_1 (Hz)	f_2 (Hz)	K[1] (dB)
Low-frequency cetaceans	0.99	5	168	26,600	0.12
High-frequency cetaceans	1.55	5	1,730	129,000	0.32
Very high-frequency cetaceans	2.23	5	5,930	186,000	0.91
Otariid pinnipeds underwater	1.58	5	2530	43,800	1.37

[1] In NMFS (2018) and NMFS (2024), this constant is symbolized by C.

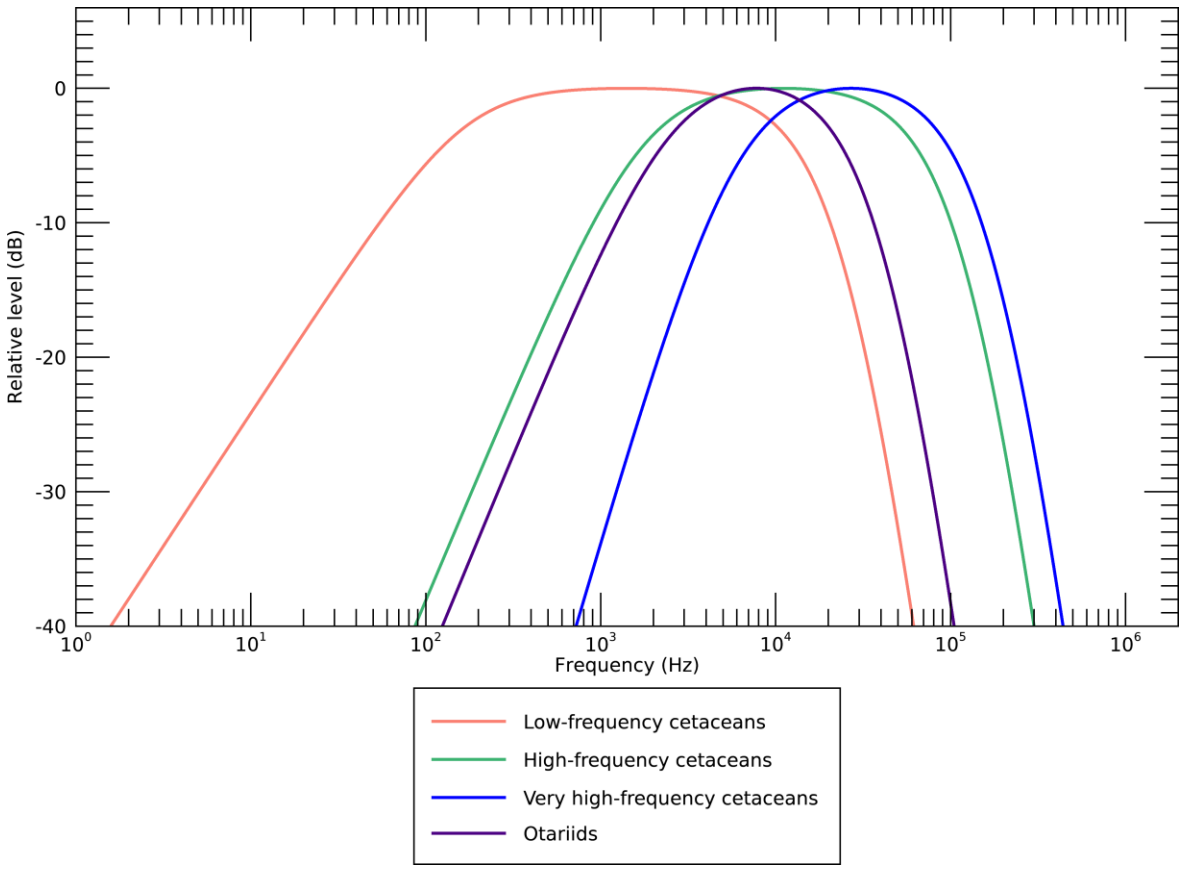


Figure A–3. Auditory weighting functions for functional marine mammal hearing groups used in this project as recommended by NMFS (2024).

Appendix B. Acoustic Source Model

B.1. Airgun Array Source Model

The source levels and directivity of the seismic source were predicted with JASCO's Airgun Array Source Model (AASM). AASM includes low– and high–frequency modules for predicting different components of the seismic source spectrum. The low–frequency module is based on the physics of oscillation and radiation of airgun bubbles, as originally described by Ziolkowski (1970), that solves the set of parallel differential equations that govern bubble oscillations. Physical effects accounted for in the simulation include pressure interactions between airguns, port throttling, bubble damping, and generator–injector (GI) gun behaviour discussed by Dragoset (1984), Laws et al. (1990), and Landrø (1992). A global optimisation algorithm tunes free parameters in the model to a large library of airgun source signatures.

While airgun signatures are highly repeatable at the low frequencies, which are used for seismic imaging, their sound emissions have a large random component at higher frequencies that cannot be predicted using a deterministic model. Therefore, AASM uses a stochastic simulation to predict the high–frequency (800–25,000 Hz) sound emissions of individual airguns, using a data–driven multiple–regression model. The multiple–regression model is based on a statistical analysis of a large collection of high quality seismic source signature data recently obtained from the Joint Industry Program (JIP) on Sound and Marine Life (Mattsson and Jenkerson 2008). The stochastic model uses a Monte–Carlo simulation to simulate the random component of the high–frequency spectrum of each airgun in an array. The mean high–frequency spectra from the stochastic model augment the low–frequency signatures from the physical model, allowing AASM to predict airgun source levels at frequencies up to 25,000 Hz.

AASM produces a set of "notional" signatures for each array element based on:

- Array layout
- Volume, tow depth, and firing pressure of each airgun
- Interactions between different airguns in the array

These notional signatures are the pressure waveforms of the individual airguns at a standard reference distance of 1 m; they account for the interactions with the other airguns in the array. The signatures are summed with the appropriate phase delays to obtain the far–field source signature of the entire array in all directions. This far–field array signature is filtered into decidecade–bands to compute the source levels of the array as a function of frequency band and azimuthal angle in the horizontal plane (at the source depth), after which it is considered a directional point source in the far field.

A seismic array consists of many sources and the point source assumption is invalid in the near field where the array elements add incoherently. The maximum extent of the near field of an array (R_{nf}) is:

$$R_{\mathrm{nf}} < \frac{l^2}{4\lambda} \qquad \text{(B–1)}$$

where λ is the sound wavelength and l is the longest dimension of the array (Lurton 2002, §5.2.4). For example, a seismic source length of l = 21 m yields a near–field range of 147 m at 2 kHz and 7 m at 100 Hz. Beyond this R_{nf} range, the array is assumed to radiate like a directional point source and is treated as such for propagation modelling.

The interactions between individual elements of the array create directionality in the overall acoustic emission. Generally, this directionality is prominent mainly at frequencies in the mid–range between

tens of hertz to several hundred hertz. At lower frequencies, with acoustic wavelengths much larger than the inter–airgun separation distances, the directionality is small. At higher frequencies, the pattern of lobes is too finely spaced to be resolved and the effective directivity is less.

B.2. VSP Modelling

B.2.1. VSP Seismic Source

Figure B–1 shows the layout of the 600 in^3 seismic source used for VSP modelling in this study. Table B–1 provides details of the airgun parameters.

For the modelled array, the layout is presented in a nominal cartesian coordinate system. In this coordinate system the direction of vessel travel determines the relative position of the array elements as plotted and tabulated. The layout used for acoustic modelling was produced by transforming the coordinates of client supplied layouts such that the resultant layouts correspond to a vessel travel direction along the positive X–axis and the array is centred on the X–Y origin. When used with an acoustic model the positive X–axis in this nominal coordinate system aligns with the vessel tow direction or survey line azimuth.

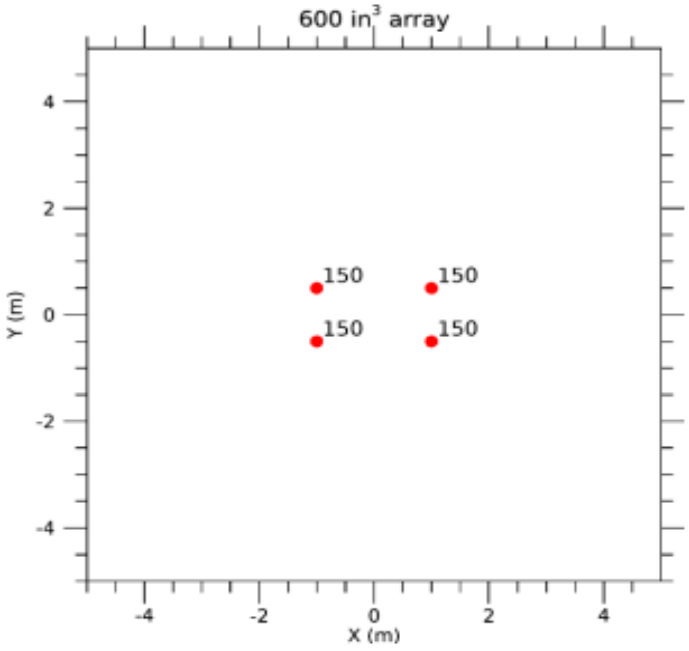


Figure B–1. Layout of the modelled 600 in^3 VSP seismic source. Tow depth is 5 m. The labels indicate the firing volume (in cubic inches) for each airgun. Also see Table B–1.

Table B–1. Layout of the modelled 600 in^3 VSP seismic source. Tow depth is 5 m. Firing pressure for all guns was 1800 psi. Greyed out values indicate spares. Also see Figure B–1.

String	Gun	x(m)	y(m)	z(m)	Vol(in^3)
1	1	1.0	0.5	5	150
	2	–1.0	0.5		150
	3	1.0	–0.5		150
	4	–1.0	–0.5		150

B.2.2. Array Source Levels and Directivity

Figure B–2 shows the broadside (perpendicular to the tow direction), endfire (parallel to the tow direction) and vertical overpressure signature and corresponding power spectrum levels for the 600 in^3 VSP array (Appendix B.2.1). Horizontal decidecade–band source levels are shown as a function of band centre frequency and azimuth in Figure B–3.

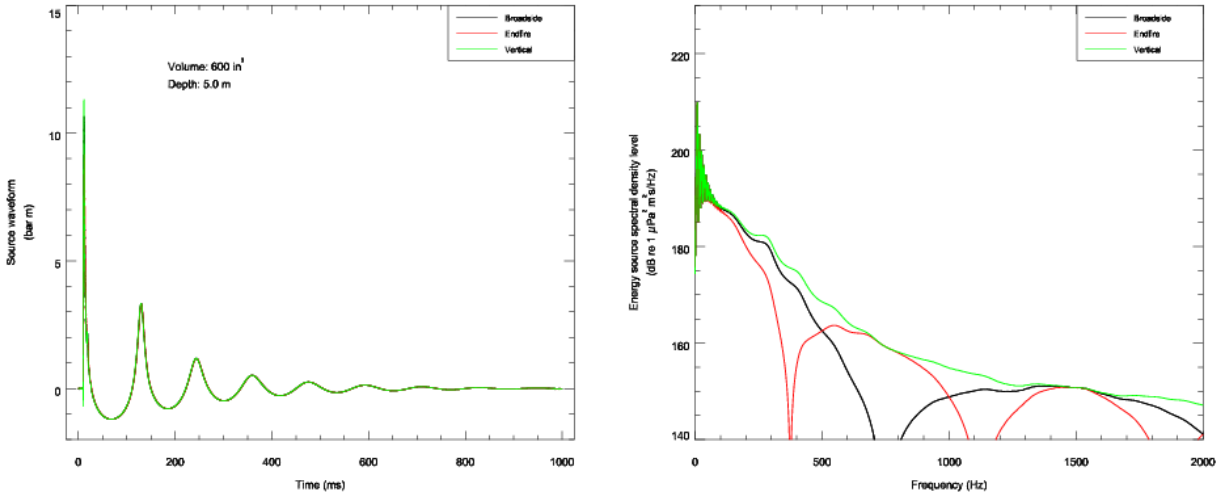


Figure B–2. Predicted source level details for the 600 in^3 array at 5 m towed depth. The power spectrum for in–plane horizontal (broadside)/perpendicular (endfire), and vertical directions (no surface ghost).

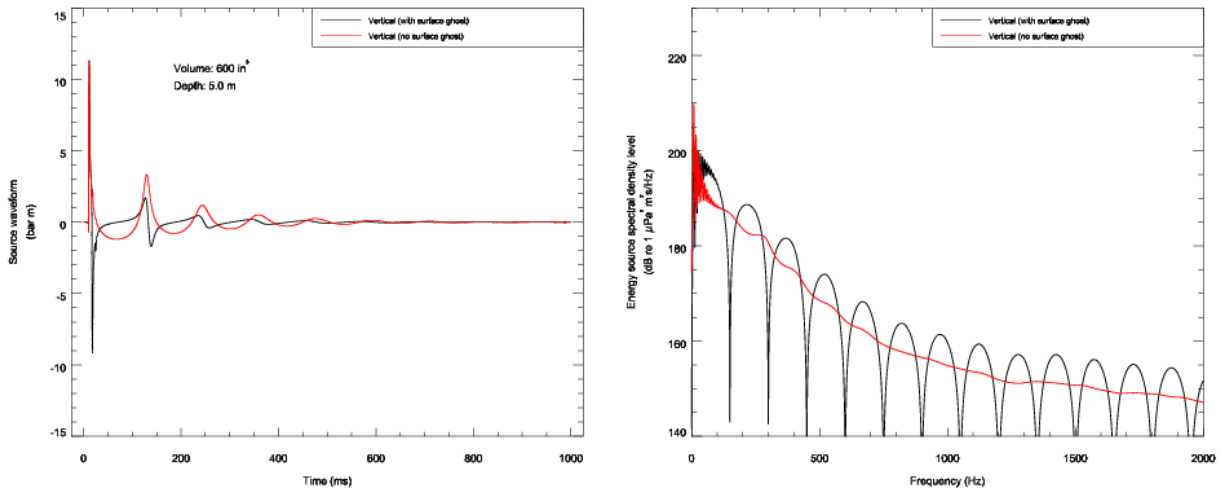


Figure B–3. Predicted source level details for the 600 in^3 array at 5 m towed depth. (Bottom) the overpressure signature.

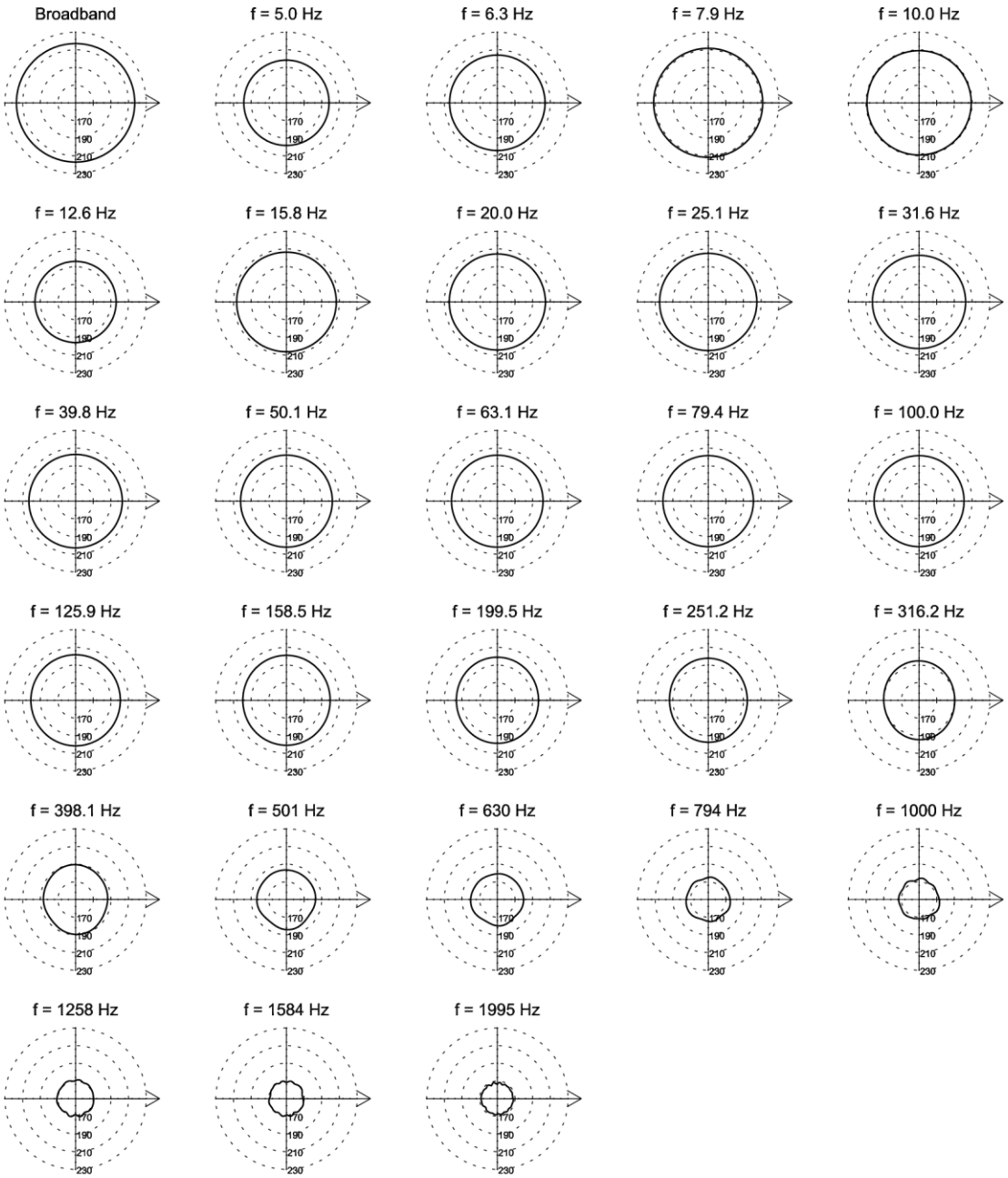


Figure B–4. Directionality of the predicted horizontal source levels for the 600 in^3 VSP seismic source, 5 Hz to 2 kHz. Source levels (in dB re 1 μPa^2·s m^2) are shown as a function of azimuth for the centre frequencies of the decidecade bands modelled; frequencies are shown above the plots. Tow depth is 5 m (see Figure B–2).

B.3. 2D Shallow Hazards Seismic Modelling

B.3.1. Seismic Source

Figure B–1 shows the layout of the 160 in^3 seismic source used for seismic survey modelling in this study. Table B–1 provides details of the airgun parameters.

For the modelled array, the layout is presented in a nominal cartesian coordinate system. In this coordinate system the direction of vessel travel determines the relative position of the array elements as plotted and tabulated. The layout used for acoustic modelling was produced by transforming the coordinates of client supplied layouts such that the resultant layouts correspond to a vessel travel

direction along the positive X–axis and the array is centred on the X–Y origin. When used with an acoustic model the positive X–axis in this nominal coordinate system aligns with the vessel tow direction or survey line azimuth.

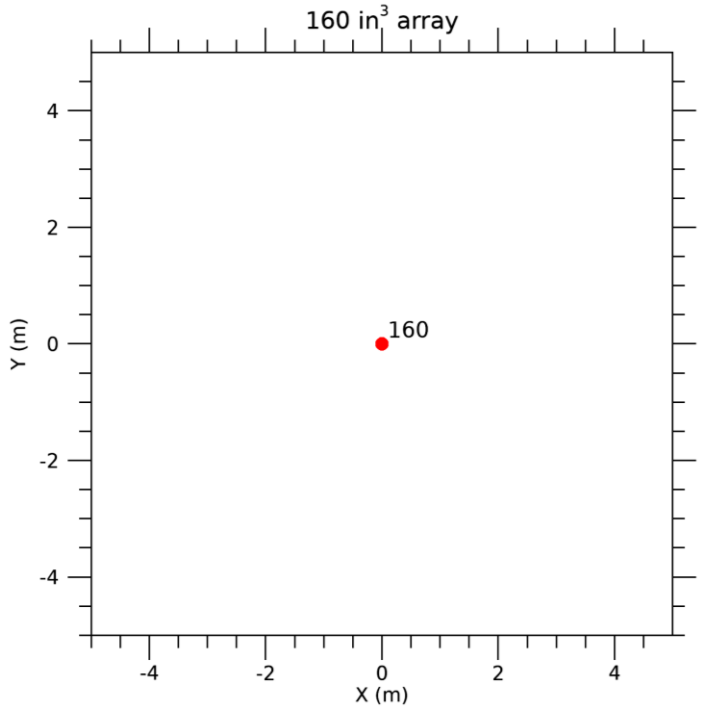


Figure B–5. Layout of the modelled 160 in^3 seismic source. Tow depth is 7 m. The labels indicate the firing volume (in cubic inches) for each airgun. Also see Table B–2.

Table B–2. Layout of the modelled 160 in^3 seismic source. Tow depth is 7 m. Firing pressure for all guns was 2000 psi. Also see Figure B–5.

String	Gun	x(m)	y(m)	z(m)	Vol(in^3)
1	1	0	0	7	160

B.3.2. Array Source Levels and Directivity

Figure B–6 shows the broadside (perpendicular to the tow direction), endfire (parallel to the tow direction) and vertical overpressure signature and corresponding power spectrum levels for the 160 in^3 array (Appendix B.3.1). Note that due to the single point source in the array, the source level and pressure signature will be the same as an omni–directional source. Horizontal decidecade–band source levels are shown as a function of band centre frequency and azimuth in Figure B–4.

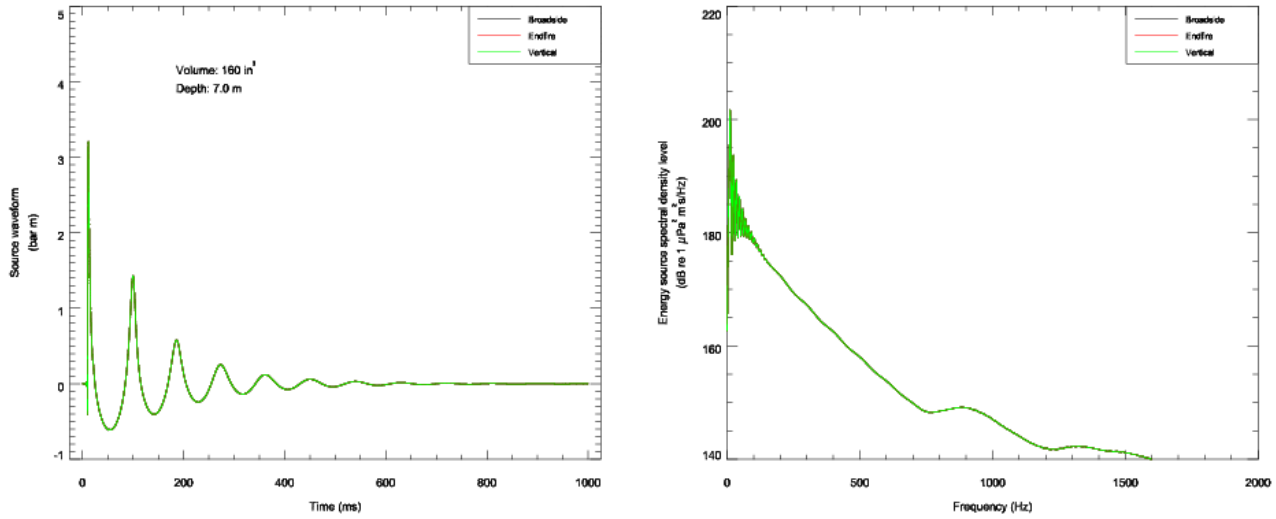


Figure B–6. Predicted source level details for the 160 in^3 seismic source. Tow depth is 7 m. The power spectrum for in–plane horizontal (broadside)/ perpendicular (endfire), and vertical directions (no surface ghost).

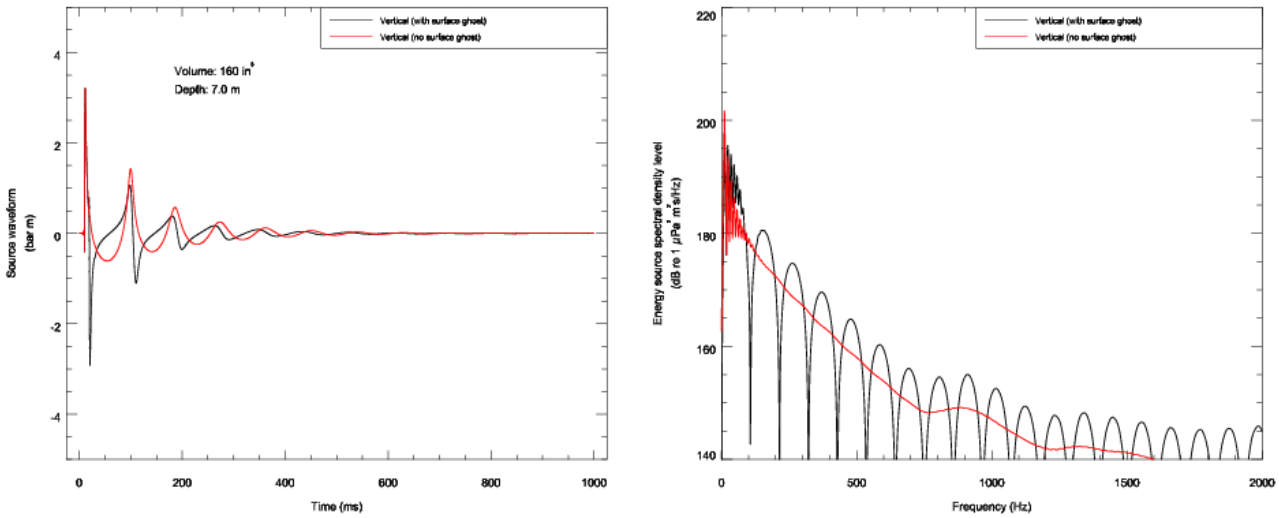


Figure B–7. Predicted source level details for the 160 in^3 seismic source. Tow depth is 7 m. The overpressure signature.

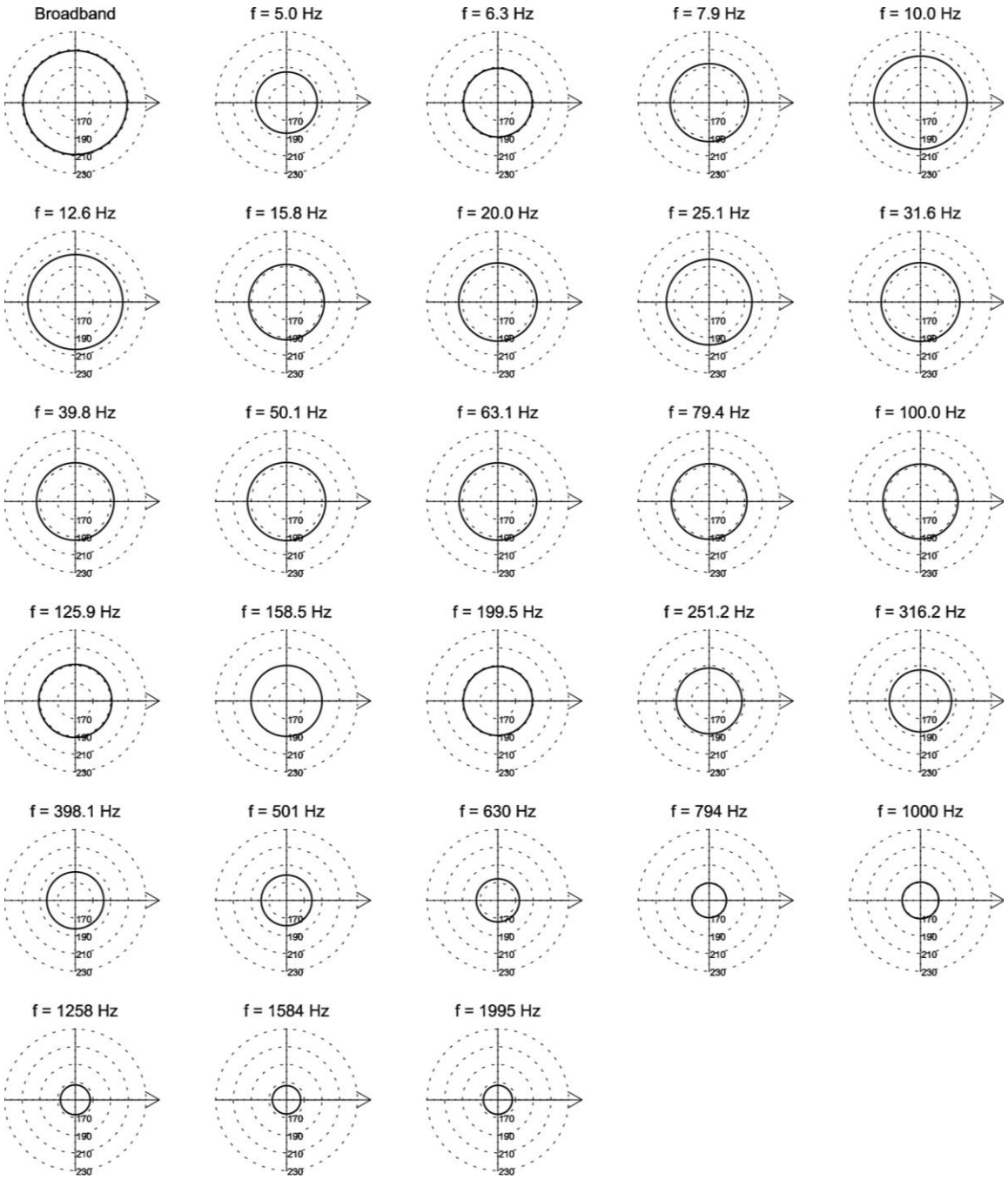


Figure B–8. Directionality of the predicted horizontal source levels for the 160 in^3 seismic source, 5 Hz to 2 kHz. Source levels (in dB re 1 $\mu Pa^2 \cdot s\ m^2$) are shown as a function of azimuth for the centre frequencies of the decidecade bands modelled; frequencies are shown above the plots. Tow depth is 7 m (see Figure B–3).

Appendix C. Methods and Parameters

C.1. Environmental Parameters

C.1.1. Bathymetry

Bathymetry throughout the modelled area was extracted from the AusBathyTopo 250 m grid regional-scale depth model for Australian waters (Beaman 2023). Bathymetry data were re–gridded and combined onto a Map Grid of Australia (MGA) coordinate projection (Zone 55) with a regular grid spacing of 250 × 250 m (Figure C–1).

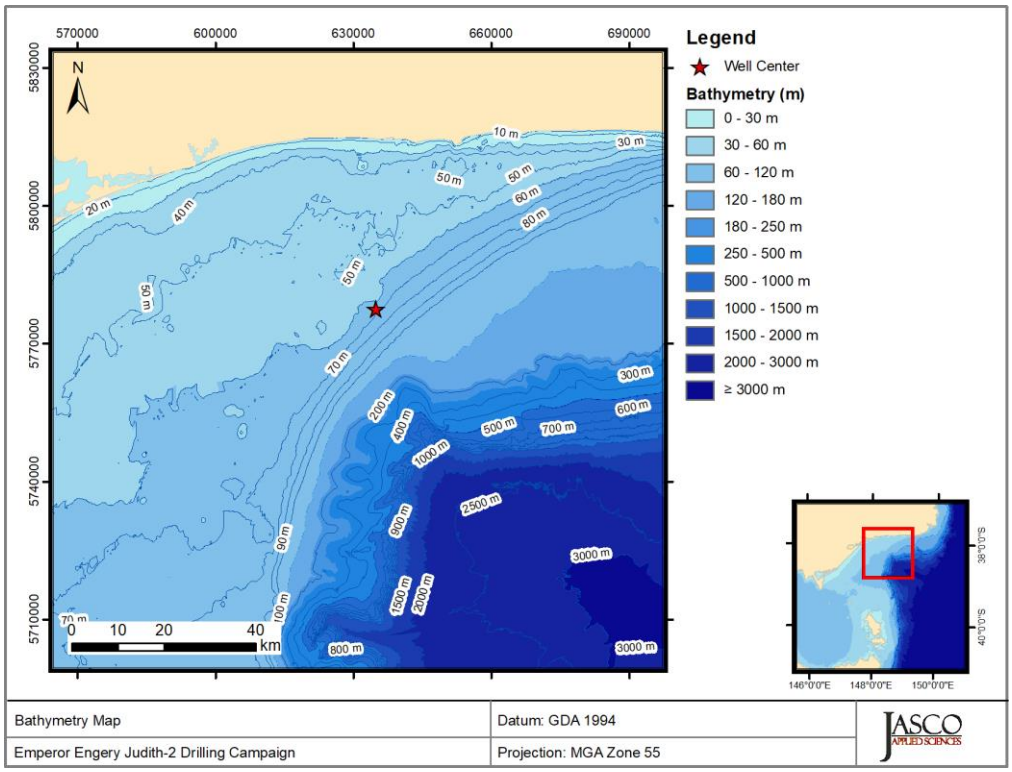


Figure C–1. Bathymetry in the modelled area.

C.1.2. Sound Speed Profile

The sound speed profile in the area was derived from temperature and salinity profiles from the U.S. Naval Oceanographic Office's Generalized Digital Environmental Model V 3.0 (GDEM; Teague et al. 1990, Carnes 2009). GDEM provides an ocean climatology of temperature and salinity for the world's oceans on a latitude–longitude grid with 0.25° resolution, with a temporal resolution of one month, based on global historical observations from the U.S. Navy's Master Oceanographic Observational Data Set (MOODS). The climatology profiles include 78 fixed depth points to a maximum depth of 6800 m (where the ocean is that deep). The GDEM temperature–salinity profiles were converted to sound speed profiles according to Coppens (1981).

Mean monthly sound speed profiles were derived from the GDEM profiles in the locality of the modelled sites. Following a sensitivity analysis, the June sound speed profile was found to be most favourable to longer–range sound propagation. As such, June was selected for sound propagation

modelling to ensure precautionary estimates of distances to received sound level thresholds. Figure C–2 shows the resulting profile, which was used as input to the sound propagation modelling.

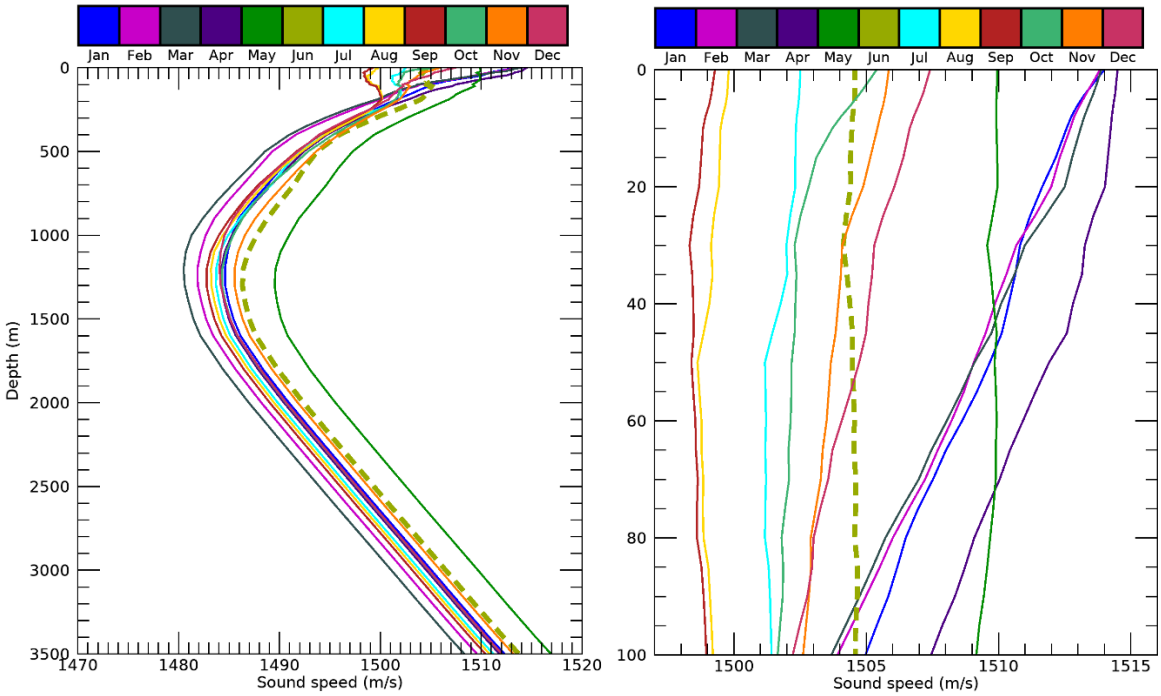


Figure C–2. Sound speed profiles for all months, with the applied month (June) displayed as a dotted line : full profile (left) and top 100 m (right) Profiles are calculated from temperature and salinity profiles from Generalized Digital Environmental Model V 3.0 (GDEM; Teague et al. 1990, Carnes 2009).

C.1.3. Geoacoustics

The available borehole that is nearest to the Judith-2 well site is a borehole made at Tuna site by Mitchell et al. (2007). The geology here consists of mostly coarse carbonate sand underlain by Limestone. Since the modelled area is a circular area with a radius of 150 km around the well centre, geological variation within the modelled radius exists. Realistically, the Tuna profile approximates an average profile near this region. In the shallower regions less than 40m depth, coarse sands dominated the most, and by looking at the other boreholes which are in various directions around the Judith-2 well, most of the profiles show dominantly coarse sands sitting on top of the limestone. Hence, the proposed geoacoustic layers are coarse sand layer over limestone layer.

For sediment layers representative grain sizes were used in the grain–shearing model proposed by Buckingham (2005) to estimate the geoacoustic parameters required by the sound propagation models. The Limestone parameters are determined using Duncan et al. (2013), representing the layer as well–cemented calcarenite. Table C–1 presents the geoacoustic profile used for all modelled sites at Judith-2 Exploration Well.

Note that MONM takes single values for shear wave parameters, so shear parameters at a shallower depth of 5m is used in the modelling since it can account for worst–case reflections and its parameter values represent an average estimation within the range in the current literature on sands (Hamilton and Bachman 1982) and Hamilton (1987).

Table C–1. Geoacoustic profile for all modelled scenarios. Each parameter varies linearly within the stated range.

Depth below seafloor (m)	Predicted lithology	Density (g/cm^3)	Compressional wave		Shear wave	
			Speed (m/s)	Attenuation (dB/λ)	Speed (m/s)	Attenuation (dB/λ)
0–40	Coarse quartz–carbonate sand	2.1	1661.6–2180.3	0.199–1.647	397	3.65
>40	Limestone	2.7	2600	0.5		

C.2. Vessel Sound Source Propagation Models

C.2.1. Propagation Loss

The propagation of sound through the environment was modelled by predicting the acoustic propagation loss—a measure, in decibels, of the decrease in sound level between a source and a receiver some distance away. Geometric spreading of acoustic waves is the predominant way by which propagation loss occurs. Propagation loss also happens when the sound is absorbed and scattered by the seawater, and absorbed scattered, and reflected at the water surface and within the seabed. Propagation loss depends on the acoustic properties of the ocean and seabed; its value changes with frequency.

If the acoustic energy source level (ESL), expressed in dB re 1 μPa^2·s m^2, and propagation loss (PL), in units of dB, at a given frequency are known, then the received level (RL) at a receiver location can be calculated in dB re 1 μPa^2·s by:

$$\mathrm{RL} = \mathrm{SL} - \mathrm{PL}. \qquad (\mathrm{C}-1)$$

C.2.2. MONM–BELLHOP

Long–range sound fields were computed using JASCO's Marine Operations Noise Model (MONM). While other models may be more accurate for steep–angle propagation in high–shear environment, MONM is well suited for effective longer–range estimation. This model computes sound propagation at frequencies of 10 Hz to 1.6 kHz via a wide–angle parabolic equation solution to the acoustic wave equation (Collins 1993) based on a version of the U.S. Naval Research Laboratory's Range–dependent Acoustic Model (RAM), which has been modified to account for a solid seabed (Zhang and Tindle 1995). MONM computes sound propagation at frequencies > 1.6 kHz via the BELLHOP Gaussian beam acoustic ray–trace model (Porter and Liu 1994b).

The parabolic equation method has been extensively benchmarked and is widely employed in the underwater acoustics community (Collins et al. 1996). MONM accounts for the additional reflection loss at the seabed, which results from partial conversion of incident compressional waves to shear waves at the seabed and sub–bottom interfaces, and it includes wave attenuations in all layers. MONM incorporates the following site–specific environmental properties: a bathymetric grid of the modelled area, underwater sound speed as a function of depth, and a geoacoustic profile based on the overall stratified composition of the seafloor.

MONM computes acoustic fields in three dimensions by modelling propagation loss within two–dimensional (2–D) vertical planes aligned along radials covering a 360° swath from the source, an approach commonly referred to as N×2–D. These vertical radial planes are separated by an angular step size of $\Delta\theta$, yielding N = 360°/$\Delta\theta$ number of planes (Figure C–3).

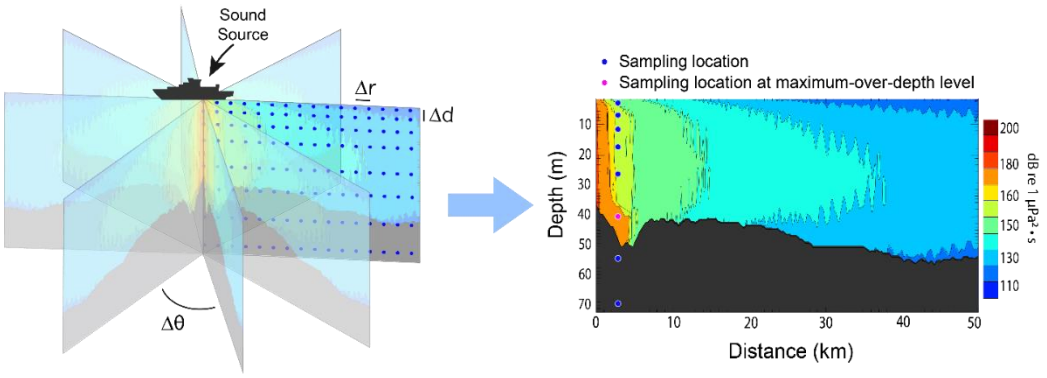


Figure C–3. The N×2–D and maximum–over–depth modelling approach used by MONM.

MONM treats frequency dependence by computing acoustic propagation loss at the centre frequencies of decidecade bands. Sufficiently many decidecade frequency–bands, starting at 10 Hz, are modelled to include most of the acoustic energy emitted by the source. At each centre frequency, the propagation loss is modelled within each of the N vertical planes as a function of depth and range from the source. The decidecade received per–second SEL are computed by subtracting the band propagation loss values from the directional source level in that frequency band. Composite broadband received per–second SEL are then computed by summing the received decidecade levels.

The received 1–s SEL sound field within each vertical radial plane is sampled at various ranges from the source, generally with a fixed radial step size. At each sampling range along the surface, the sound field is sampled at various depths, with the step size between samples increasing with depth below the surface. The step sizes are chosen to provide increased coverage near the depth of the source and at depths of interest in terms of the sound speed profile. For areas with deep water, sampling is not performed at depths beyond those reachable by marine mammals. The received per–second SEL at a surface sampling location is taken as the maximum value that occurs over all samples within the water column, i.e., the maximum–over–depth received per–second SEL. These maximum–over–depth per–second SEL are presented as colour contours around the source.

C.3. Seismic Sound Propagation Models

C.3.1. MONM–BELLHOP

See above section Appendix C.2.2.

C.3.2. Full Waveform Range–dependent Acoustic Model: FWRAM

For impulsive sounds from the seismic source, time–domain representations of the pressure waves generated in the water are required to calculate SPL and PK. Furthermore, the seismic source must be represented as a distributed source to accurately characterise vertical directivity effects in the near–field zone. For this study, synthetic pressure waveforms were computed using FWRAM, which is a time–domain acoustic model based on the same wide–angle parabolic equation (PE) algorithm as MONM. FWRAM computes synthetic pressure waveforms versus range and depth for range–varying marine acoustic environments, and it takes the same environmental inputs as MONM (bathymetry, water sound speed profile, and seafloor geoacoustic profile). Unlike MONM, FWRAM computes pressure waveforms via Fourier synthesis of the modelled acoustic transfer function in closely spaced frequency bands. FWRAM employs the array starter method to accurately model sound propagation from a spatially distributed source (MacGillivray and Chapman 2012).

Besides providing direct calculations of the PK and SPL, the synthetic waveforms from FWRAM can also be used to convert the SEL values from MONM to SPL.

C.3.3. Wavenumber Integration Model

Sound pressure levels near the seismic source were modelled using JASCO's VSTACK wavenumber integration model. VSTACK computes synthetic pressure waveforms versus depth and range for arbitrarily layered, range–independent acoustic environments using the wavenumber integration approach to solve the exact (range–independent) acoustic wave equation. This model is valid over the full angular range of the wave equation and can fully account for the elasto–acoustic properties of the sub–bottom. Wavenumber integration methods are extensively used in the field of underwater acoustics and seismology where they are often referred to as reflectivity methods or discrete wavenumber methods. VSTACK computes sound propagation in arbitrarily stratified water and seabed layers by decomposing the outgoing field into a continuum of outward–propagating plane cylindrical waves. Seabed reflectivity in the model is dependent on the seabed layer properties: compressional and shear wave speeds, attenuation coefficients, and layer densities. The output of the model can be post–processed to yield estimates of the SEL, SPL, and PK.

VSTACK accurately predicts steep–angle propagation in the proximity of the source, but it is computationally slow at predicting sound pressures at large distances due to the need for smaller wavenumber steps with increasing distance. Additionally, VSTACK assumes range–invariant bathymetry with a horizontally stratified medium (i.e., a range–independent environment) which is azimuthally symmetric about the source. VSTACK is thus best suited to modelling the sound field near the source.

C.3.3.1. Particle Motion

VSTACK was also used to compute estimates of particle acceleration and velocity at two sites for the 600 in^3 and 160 in^3 seismic source. Particle motion waveforms were modelled, and pulse metrics were computed from the time–domain traces. VSTACK uses the wavenumber integration approach to solve the exact acoustic wave equation for arbitrarily layered range–independent acoustic environments.

The VSTACK model setup for the particle velocity scenarios was identical to that for the peak pressure scenarios (Section 3.2.2) in terms of source treatment, frequency range and environmental model. The particle acceleration and velocity waveforms were computed to a maximum distance of 1000 m in the broadside and endfire directions from the centre of the airgun array for a receiver 5 cm above the seafloor.

As discussed above in Appendix C.3.3, particle velocity (v) is the physical speed of a particle in a material. It can be derived from the pressure gradient and Euler's linearised momentum equation where ρ_0 is the density of the medium. Since the wavenumber integration kernel is a product of analytic expressions in terms of range and depth, VSTACK computes particle velocity by computing the spatial gradient of the pressure field analytically in the frequency domain. Fourier synthesis is applied to compute time series synthetic pressure and/or velocity waveforms at depth and range receivers by convolving the source waveforms with the impulse response of the waveguide. Particle velocity metrics at each receiver location were calculated from the modelled particle motion along three perpendicular axes (horizontal and along the source–receiver path, horizontal and perpendicular to the source–receiver path, and vertical).

The particle velocity results were converted to acceleration by time differentiation. The peak particle acceleration and velocity were calculated from the maximum of the predicted acceleration and velocity magnitude, defined as "peak magnitude" and are presented as plots of peak value versus range.

C.4. Estimating Range to Thresholds Levels

Sound level contours were calculated based on the underwater sound fields predicted by the propagation models, sampled by taking the maximum value over all modelled depths above the sea floor for each location in the modelled region. The predicted distances to specific levels were computed from these contours. Two distances relative to the source are reported for each sound level: 1) R_{max}, the maximum range to the given sound level over all azimuths, and 2) $R_{95\%}$, the range to the given sound level after the 5% farthest points were excluded (see examples in Figure C–4).

The $R_{95\%}$ is used because sound field footprints are often irregular in shape. In some cases, a sound level contour might have small protrusions or anomalous isolated fringes. This is demonstrated in the image in Figure C–4(a). In cases such as this, where relatively few points are excluded in any given direction, R_{max} can misrepresent the area of the region exposed to such effects, and $R_{95\%}$ is considered more representative. In strongly asymmetric cases such as shown in Figure C–4(b), on the other hand, $R_{95\%}$ neglects to account for significant protrusions in the footprint. In such cases R_{max} might better represent the region of effect in specific directions. Cases such as this are usually associated with bathymetric features affecting propagation. The difference between R_{max} and $R_{95\%}$ depends on the source directivity and the non–uniformity of the acoustic environment.

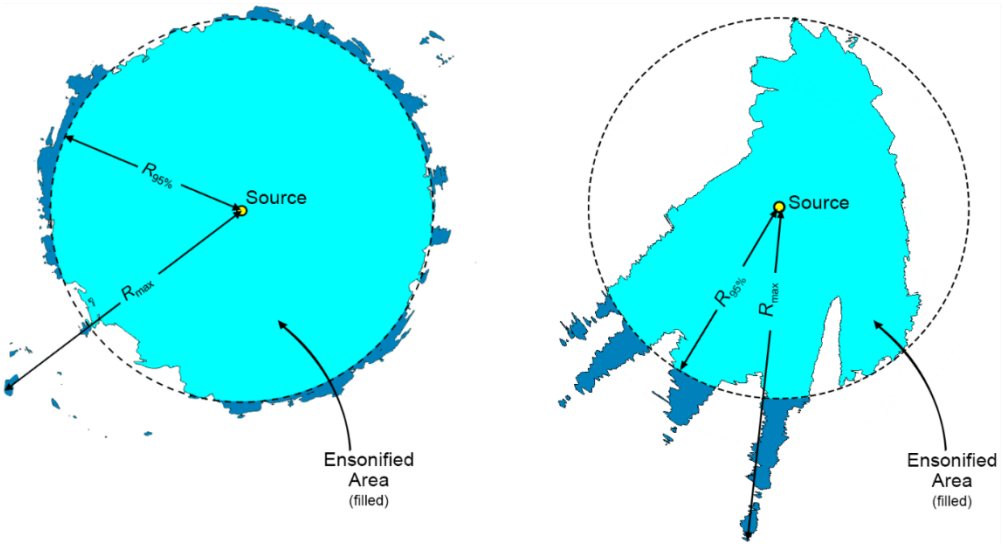


Figure C–4. Sample areas ensonified to an arbitrary sound level with R_{max} and R95% ranges shown for two different scenarios. (a) Largely symmetric sound level contour with small protrusions. (b) Strongly asymmetric sound level contour with long protrusions. Light blue indicates the ensonified areas bounded by $R_{95\%}$; darker blue indicates the areas outside this boundary which determine R_{max}.

C.5. Estimating SPL from Modelled SEL Results – Impulsive Signals

The per–pulse SEL of sound pulses is an energy–like metric related to the dose of sound received over a pulse's entire duration. The pulse SPL on the other hand, is related to its intensity over a specified time interval. Seismic pulses typically lengthen in duration as they propagate away from their source, due to seafloor and surface reflections, and other waveguide dispersion effects. The changes in pulse length, and therefore the time window considered, affect the numeric relationship between SPL and SEL. This study has applied a fixed window duration to calculate SPL (Tfix = 125 ms; see

Appendix A.1), as implemented in Martin et al. (2017b). Full–waveform modelling was used to estimate SPL, but this type of modelling is computationally intensive, and can be prohibitively time consuming when run at high spatial resolution over large areas.

For the current study, FWRAM (Appendix C.3.2) was used to model synthetic seismic pulses over the frequency range 5–1024 Hz. This was performed along all broadside and endfire radials. FWRAM uses Fourier synthesis to recreate the signal in the time domain so that both the SEL and SPL from the source can be calculated. The differences between the SEL and SPL were extracted for all ranges and depths that corresponded to those generated from the high spatial–resolution results from MONM. A 125 ms fixed time window positioned to maximize the SPL over the pulse duration was applied. The resulting SEL–to–SPL offsets were averaged in 0.02 km range bins along each modelled radial and depth, and the 90th percentile was selected at each range to generate a generalised range–dependent conversion function for each site. The range–dependent conversion function was applied to predicted per–pulse SEL results from MONM to model SPL values. Figure C–5 and C–6 show the conversion offset for the VSP array and the 160 in^3 airgun. The conversion to SPL from SEL was conducted considering the water depth and seabed geology at the modelled site.

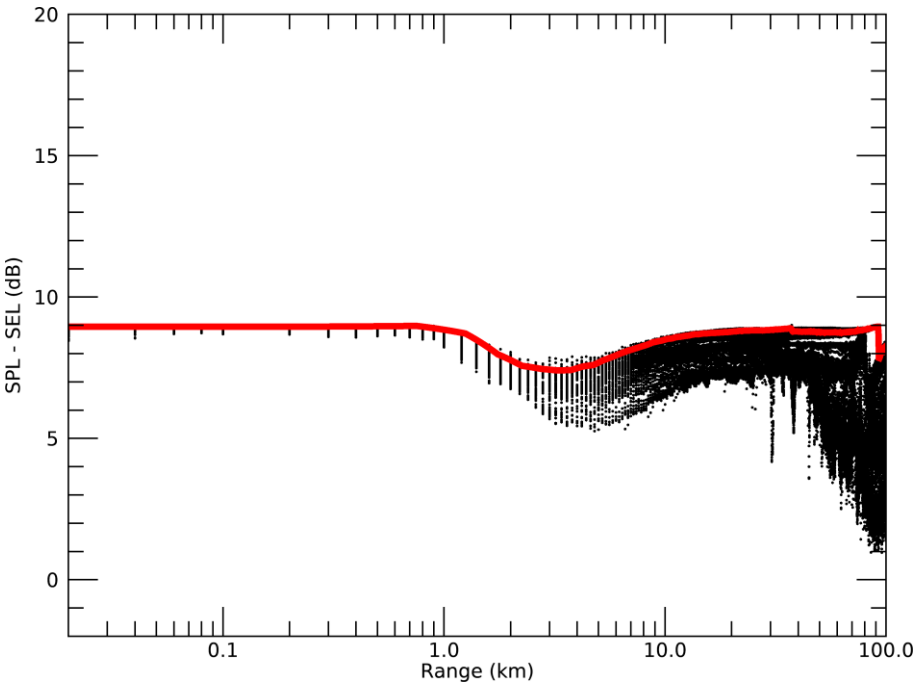


Figure C–5. *600 in^3 VSP source*: Range–and–depth–dependent conversion offsets for converting sound exposure level (SEL) to sound pressure level (SPL) for seismic pulses. Black lines are the modelled differences between SEL and SPL across different radials and receiver depths; the solid red line is the 90th percentile of the modelled differences at each range.

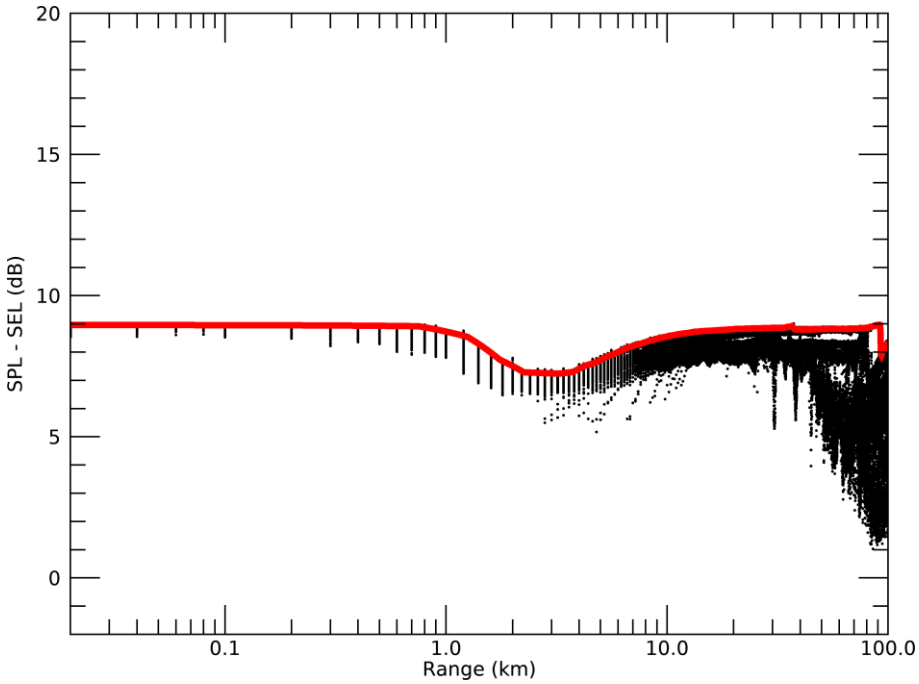


Figure C–6. *160 in³ seismic source*: Range–and–depth–dependent conversion offsets for converting sound exposure level (SEL) to sound pressure level (SPL) for seismic pulses. Black lines are the modelled differences between SEL and SPL across different radials and receiver depths; the solid red line is the 90th percentile of the modelled differences at each range.

C.6. Estimating Sound Fields from Moving Vessels

During vessel transit, new sound energy is constantly being introduced to the environment. The noise footprint for the transiting vessels considered in this report were estimated by modelling the 1–s maximum over depth SEL footprints for the vessel at one location, and by translating and summing these footprints along the vessel transit routes. The vessel locations along the tracks were spaced uniformly, with an approximate step of $\Delta s \approx 10$ m.

The SEL sound field at any given point along the track is dependent upon the time duration within each 10 m segment of the track. When the track segment spacing is fixed, the duration of exposure depends upon the speed of the vessel during each segment of the transit. The 1–s SEL footprint at each vessel location (i) was therefore scaled based on the speed of the vessel following:

$$\mathrm{SEL}_i = \mathrm{SEL}_{1s} + 10 \log_{10}\left(\frac{\Delta s}{v}\right) . \qquad \text{(C–2)}$$

where v represents the vessel speed in m/s.

The present method acceptably reflects large–scale sound propagation features, primarily dependent on water depth, which dominate the cumulative field and is thus considered to provide a meaningful estimate of the SEL_{24h} field.

C.7. Model Validation Information

Predictions from JASCO's propagation models (MONM, FWRAM, and VSTACK) have been validated against experimental data from a number of underwater acoustic measurement programs conducted by JASCO globally, including programs in the United States and Canadian Arctic, Canadian and southern United States waters, Greenland, Russia and Australia (Hannay and Racca 2005, Aerts et al.

2008, Funk et al. 2008, Ireland et al. 2009, O'Neill et al. 2010, Warner et al. 2010, Racca et al. 2012a, Racca et al. 2012b, Matthews and MacGillivray 2013, Martin et al. 2015, Racca et al. 2015, Martin et al. 2017a, Martin et al. 2017b, Warner et al. 2017, MacGillivray 2018, McPherson et al. 2018, McPherson and Martin 2018).

In addition, JASCO has conducted measurement programs associated with a significant number of anthropogenic activities that have included internal validation of the modelling (including McCrodan et al. 2011, Austin and Warner 2012, McPherson and Warner 2012, Austin and Bailey 2013, Austin et al. 2013, Zykov and MacDonnell 2013, Austin 2014, Austin et al. 2015, Austin and Li 2016, Martin and Popper 2016, Austin et al. 2018b, Beach Energy Limited 2020).

Emperor Energy Geophysical Survey Sources

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FROM: Steven Connel, Matthew Koessler (JASCO Applied Sciences (Australia) Pty Ltd)

TO: Emperor Energy

Subject: Geophysical Survey Investigation Sources: Acoustic Effect Estimation

JASCO Applied Sciences (JASCO) performed an estimation study of underwater sound levels to support Emperor Energy's geographical and geophysical subsea infrastructure investigations. This study was commissioned to help assess sounds from geophysical survey equipment that may affect marine fauna. Acoustic sources that are planned to be used for the proposed investigations comprise side scan sonars (SSSs) and sub-bottom profilers (SBPs). Collectively these sources can be referred to high-resolution geophysical (HRG) survey equipment.

Site and source specific modelling were not conducted, however JASCO completed a review of previously completed public and confidential studies to inform this estimation study.

1. Noise Effect Criteria

Different noise effect criteria for marine fauna are applicable depending on whether a sound source is classified as impulsive or non-impulsive. Non-impulsive sound sources can be continuous or intermittent, and produce sounds that can be broadband, narrowband or tonal, and brief or prolonged. Non-impulsive sources do not have the high peak sound pressure with rapid rise time typical of impulsive sounds.

[NMFS] National Marine Fisheries Service (US) (2023) suggest classifying some sonar sources as non-impulsive sound sources; however, some types of equipment may have impulsive characteristics. NMFS further divides non-impulsive sources as either intermittent or continuous depending on their sound characteristics. One of the characteristics that has been used to categorise HRG surveying equipment as either impulsive or non-impulsive sources is the repetition rate at which they operate. A 10 Hz repetition rate has been used as the value to discriminate whether a HRG source should be classified as impulsive or non-impulsive (Vineyard Wind and JASCO Applied Sciences 2020), JASCO recommends the following:

- SSSs be treated as continuous non-impulsive sources if their repetition rate is equal to or above 10 Hz,
- SSSs be treated as intermittent non-impulsive sources if their repetition rate is less than 10 Hz,
- SBPs be treated as impulsive sources due to their high peak sound pressure with rapid rise time.

The perceived loudness of sound, especially impulsive noise, is not generally proportional to the instantaneous acoustic pressure. Rather, perceived loudness depends on the pulse rise-time and duration, and the frequency content of the sound. Several sound level metrics, such as peak sound pressure (PK), sound pressure level (SPL), and sound exposure levels (SEL), are commonly used to evaluate noise and its effects on marine life. The acoustic metrics in this report reflect the updated ANSI and ISO standards for acoustic terminology, ANSI-ASA (2013) and ISO/DIS 18405 (2017).

The metrics used to describe considered sound sources are:

- Sound exposure level (SEL or L_E; dB re 1 µPa^2·s), which is the time-integral of the squared acoustic pressure over a duration (T).
- Sound pressure level (SPL or L_p; dB re 1 µPa), which is the root-mean-square (rms) pressure level in a stated frequency band over a specified time window (T; s). It is important to note that SPL always refers to a rms pressure level and therefore not instantaneous pressure. An historic approach used to evaluate SPL of impulsive signals underwater is to calculate the sound pressure level over the 90 %-energy time window of a pulse, referred to as SPL ($L_{p,90\%}$). T_{90} is the time interval over which the cumulative energy rises from 5 to 95 % of the total pulse energy. This is the approach that has been applied within the cited literature below.
- Additionally, for sonar sources, peak sound pressure (PK or L_{pk}; dB re 1 µPa) can be used as an additional descriptor, which is the decibel level of the maximum instantaneous acoustic pressure.

JASCO chose the following noise criteria for this study because they are relevant to the sources being considered and because they represent the best available science at the time:

- Peak pressure levels (PK; L_{pk}) and frequency-weighted accumulated sound exposure levels (SEL; $L_{E,24h}$) from NMFS (2024) for the onset of permanent threshold shift (PTS) and temporary threshold shift (TTS) in marine mammals (Table 1). Peak pressure levels (PK; L_{pk}) apply to impulsive sources only (Table 1).
- Marine mammal behavioural response threshold based on the current US National Oceanic and Atmospheric Administration (NOAA 2019) and NMFS (2023) criteria for marine mammals of 160 dB re 1 µPa (SPL; L_p) for impulsive and intermittent non-impulsive sound sources, and 120 dB re 1 µPa (SPL; L_p) for continuous non-impulsive sound sources (Table 3).
- Sound exposure guidelines for fish, fish eggs and larvae, and turtles (Popper et al. 2014) for impulsive and non-impulsive sound sources.
- Peak pressure levels (PK; L_{pk}) for impulsive and frequency-weighted accumulated sound exposure levels (SEL; $L_{E,24h}$) for impulsive and non-impulsive (both continuous and intermittent) from Finneran et al. (2017) for the onset of PTS and TTS in turtles.
- Sea turtle behavioural response threshold of 166 dB re 1 µPa (SPL; L_p) (McCauley et al. 2000), along with a sound level associated with behavioural disturbance of 175 dB re 1 µPa (SPL; L_p) (McCauley et al. 2000). These apply to impulsive sources only.

Additional material is provided on the potential impact to benthic invertebrates in Section 4.1, however there is not currently sufficient material to determine robust criteria for which an assessment can be conducted. A qualitative discussion is provided in Section 4.1.

Table 1. Acoustic effects of impulsive noise on marine mammals: Unweighted SPL, SEL_{24h}, and PK thresholds.

Hearing group	NMFS (2024)			
	TTS onset thresholds* (received level)		PTS onset thresholds* (received level)	
	Weighted SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)	PK (L_{pk}; dB re 1 µPa)	Weighted SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)	PK (L_{pk}; dB re 1 µPa)
Low–Frequency (LF) cetaceans	168	216	183	222
High–frequency (HF) cetaceans	178	224	193	230
Very High–frequency (VHF) cetaceans	144	196	159	202
Otariid Seals	170	224	185	230

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating TTS or PTS onset.

L_{pk} denotes peak sound pressure is flat weighted or unweighted and has a reference value of 1 µPa.

$L_{E,24h}$ denotes cumulative sound exposure over a 24 h period and has a reference value of 1 µPa²s.

Table 2. Criteria for effects of non–impulsive noise exposure, including vessel noise, for marine mammals: unweighted SPL and weighted SEL_{24h} thresholds.

Hearing group	NMFS (2024)	
	TTS onset thresholds (received level)	PTS onset thresholds (received level)
	Weighted SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)	Weighted SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)
Low–frequency (LF) cetaceans	177	197
High–frequency (HF) cetaceans	181	201
Very High–frequency (VHF) cetaceans	161	181
Otariid seals	179	199

L_E denotes cumulative sound exposure over a 24 h period and has a reference value of 1 µPa²·s.

Table 3. Unweighted SPL, behavioural response threshold criteria for marine mammals.

Sound source characteristics	NOAA (2024), NMFS (2023)
	SPL (L_p; dB re 1 µPa)
Impulsive	160
Intermittent	160
Continuous	120

L_p - denotes sound pressure level period and has a reference value of 1 µPa.

2. Estimating Sound Exposure from Side Scan Sonar Surveys

Side Scan Sonar (SSS) is a marine geophysical survey technique that is used to produce an image of the seafloor to identify obstructions or features. This type of survey comprises transducers mounted on either side of a vehicle towed above the seabed (e.g. towfish). SSS transducers may also be mounted on Autonomous Underwater Vehicle (AUV) systems, vessel hulls or ROVs.

Side scan sonar is highly directional in the horizontal plane, with sound levels outside the beam significantly less than those within the beam. However, a swath of beam energy is output in the vertical plane perpendicular to the tow direction (Figure 1). SSS towfish are typically towed 10-20 m above the seabed, thus the beam is typically restricted to a swath close to the seabed by design. SSSs can produce acoustic signals over a variety of narrow band frequencies, but typically between 70 kHz and 400 kHz.

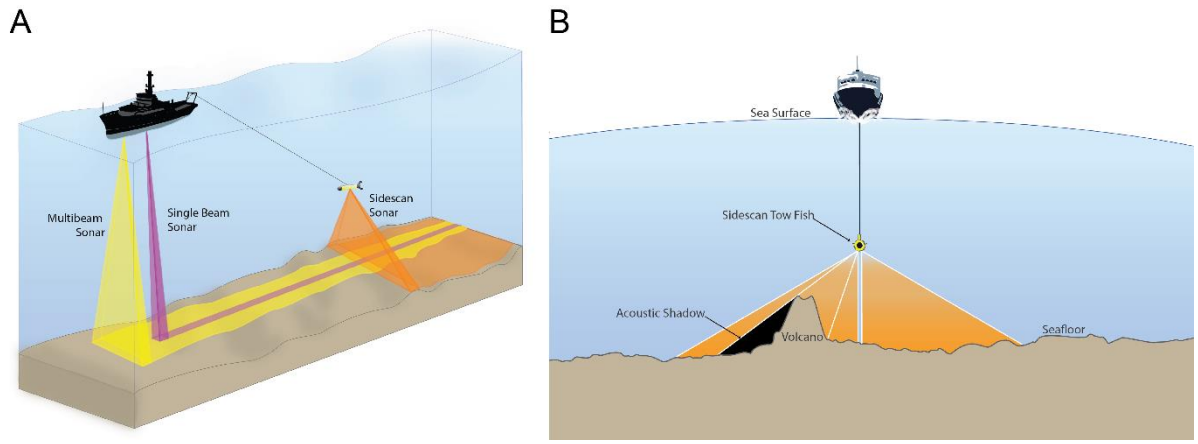


Figure 1. Graphical illustration of the differences between multi-beam, single beam, and side scan sonar. B) Graphical illustration of the side scan towfish swath coverage of the seafloor. Illustrations by Vicki Gazzola. https://ecce.esri.ca/wp-content/uploads/2022/01/Towfish.png

Representative SSS systems include those from EdgeTech, such as the 4200 SSS model. The 4200 SSS produces signals at 120 and 410 kHz when operated in 100 and 400 kHz modes, respectively. Some models may contain additional operational modes; however, measurements exist for the two frequency regimes of the EdgeTech 4200, and they are different enough to represent the different operational regimes of other SSSs. The EdgeTech 4200 SSS model only generates high frequency signals, and in this case, will only be relevant for fauna with sensitivity to signals of approximately 100 kHz or higher. Marine mammal frequency weighting functions are presented in Appendix B.

Sound emissions that exceed 100 kHz would not be heard by low-frequency cetaceans, fish, and turtles, which are most sensitive to signals well below 110 kHz. The frequencies of sound produced by the SSS unit considered here will only be relevant to fauna sensitive to higher frequencies that may be impacted by accumulated SEL (i.e. high-frequency cetaceans and very-high-frequency cetaceans).

Measurements of an EdgeTech 4200 were reported in Crocker and Fratantonio (2016) for 100 and 400 kHz modes, with a maximum per-pulse source level of 176 dB re 1 μPa^2s m (SEL) and 205 dB re 1 µPa m (SPL) respectively. Table 4 provides nominal, but upper bound values for the EdgeTech 4200 SSS, which have been written in units to align with the updated ANSI and ISO standards for acoustic terminology, ANSI S1.1 (2013) and ISO 18405:2017 (2017). The repetition rate was nominally selected as 10 Hz; however, repetition rates can vary depending on the speed of a SSS survey.

Table 4. Side scan sonar source specifications, adapted from Crocker and Fratantonio (2016)

Equipment	Operational Mode (kHz)	Source Level (dB re 1 µPa m)	Peak Source Level (dB re 1 µPa m)	Energy source level (dB re 1 μPa^2s m^2)	Beam Width[a] (°)	Pulse Duration (ms)	Repetition Rate (Hz)
EdgeTech 4200	400	205	210	176	178	1.3	10[a]
	100	201	206	179	178	7.2	

[a] SSS nominal repetition rate estimated from manufacture specifications which stating that repetition rate is selected to ensure three pings incident on a 1 m^3 target volume at range of 100 m for a given vessel survey speed in accordance with hydrographic standards (NOAA 2016).

For the 100 and 400 kHz operational modes and the specifications in Table 4, Table 5 presents the frequency weighted SEL PTS and TTS horizontal impact distance estimates for a nominal side scan sonar survey considering a spreading loss calculation described in Appendix A, weighting curves can be found in Appendix B.

Table 5. Horizontal distances (m) to frequency-weighted SEL_{24h} based PTS and TTS marine mammal thresholds from NMFS (2024) for a nominal side scan sonar survey. An N/A indicates that the operational model produces the majority of its acoustic energy outside the hearing group sensitivity range.

Hearing group	Threshold for SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)	Nominal estimated horizontal distance (m) to SEL threshold	
		400 kHz Mode	100 kHz Mode
PTS			
High-frequency (HF) cetaceans	201	N/A	*
Very High-frequency (VHF) cetaceans	181	*	7
Otariid seals	199	*	*
TTS			
High-frequency (HF) cetaceans	181	N/A	5
Very High-frequency (VHF) cetaceans	161	7	139
Otariid seals	219	*	*

An asterisk indicates that the sound level threshold will likely not be reached.

Austin et al. (2013) also measured the EdgeTech 4200 system during an operational program, focusing on the 120 kHz signals (100 kHz mode). They reported the distance from in-beam pulses to an SPL of 120 dB re 1 µPa to be 1400 m. The measurements conducted in Austin et al. (2013) therefore indicate that the marine mammal behavioural response criteria could be exceeded up to 1400 m from SSS equipment for high-frequency and very-high-frequency cetaceans; however, these ranges were extrapolated based on curves fitted to data and may not be fully constrained at longer ranges, and thus should be considered conservative. As a comparative example, the spreading loss calculation presented here predicts maximum horizontal distances between 340 – 705 m to the marine mammal behavioural response criteria for non-impulsive continuous sound sources of 120 dB re 1 µPa (SPL; L_p) for high-frequency and very-high-frequency cetaceans.

Sound emissions that exceed 100 kHz would not be heard by low-frequency cetaceans, fish, and turtles, which are most sensitive to signals well below 110 kHz. The frequencies of sound produced by the SSS units considered here will only be relevant to fauna sensitive to higher frequencies that may be impacted by accumulated SEL (i.e. high-frequency cetaceans and very-high-frequency cetaceans). Therefore no effects are predicted, for low-frequency cetaceans, fish and sea turtles, from the considered SSS equipment.

3. Estimating Sound Exposure from Sub-Bottom Profilers

Sub-bottom profilers (SBPs) are marine geophysical survey equipment that are used to generate cross-sectional images of shallow geological structure below the seafloor. There are a variety of SBP instrument types including, but not limited to, boomers, sparkers, airguns and transducer (Chirp) type systems. We understand that transducer type systems are likely to be used for geographical and

geophysical subsea infrastructure investigations for the Emperor Energy's offshore developments Fields, but that boomers might also be included.

3.1. Transducer Type Sub-Bottom Profilers

Transducer type SBP systems typically produce a swept-frequency signal, i.e. the signal is emitted over time and over a specific frequency range. The pulse length, frequency bandwidth, and phase/amplitude characteristics of a pulse are generally selectable. The transducer that transmits a signal also receives the signal reflected from the seafloor. These types of SBPs operate at medium to high frequencies (~1 kHz – 25 kHz); a given instrument and processing systems specifications define the bandwidth of the signal and characteristics, which can vary by SBP system and manufacturer.

JASCO have previously modelled an EdgeTech X-Star SBP (manufactured by EdgeTech) mounted on SBP-216 tow-fish (McPherson and Wood 2017). In that modelling study, the operational frequency range was 2 kHz to 16 kHz. Sound levels associated with the marine mammal behavioural response criterion of 160 dB re 1 µPa (SPL; L_p) for impulsive sound sources were not exceeded beyond a horizontal distance of less than 2 m from the SBP.

Crocker and Fratantonio (2016) reported source levels for several different SBPs. Table 6 provides nominal, but upper bound values for the three transducer SBPs extracted from Crocker and Fratantonio (2016). Units have been written to align with the updated ANSI and ISO standards for acoustic terminology, ANSI S1.1 (2013) and ISO 18405:2017 (2017).

Table 6. Sub-bottom profiler source specifications, adapted from Crocker and Fratantonio (2016)

Equipment	Operational Mode	Frequency Bandwidth (kHz)	Source Level (dB re 1 µPa m)	Peak Source Level (dB re 1 µPa m)	Energy source level (dB re 1 µPa^{2}s m^2)	Beam Width (°)	Pulse Duration (ms)	Repetition Rate (Hz)[1]
EdgeTech 424	100% Power	8.5-12.4	178	184	154	71	3.5	5
EdgeTech 512	100% Power	5.7-9	179	184	159	51	9.1	
Knudsen 3202	Power Setting 4	3.3-5.7	209	214	193	78	21.4	

[1] Repetition rate proposed in considering specification documents and previous public information (Vineyard Wind and JASCO Applied Sciences 2020). These are nominal and depend on usage.

In a similar procedure to the other source types considered in this report, a simple spreading loss model was used to calculate estimates of sound propagation and to provide distances estimates to noise effect criteria for marine fauna. Received levels have been calculated based on an assumption of spherical spreading with absorption loss; the method is described in Appendix A . For the SBPs listed in Table 6, the considered frequencies are sufficiently high enough, and the corresponding wavelengths are sufficiently short enough, such that a simple spreading loss model is an applicable tool to provide distance estimates to impact criteria. The application of this method may not hold for all SPB systems and per-case, per-system considerations are required. Table 7 presents the frequency weighted SEL PTS and TTS horizontal impact distance estimates for a nominal sub-bottom survey (refer to Appendix A for calculation details and weighting curves can be found in Appendix B).

Table 7. Horizontal distances (m) for frequency-weighted SEL_{24h} based PTS and TTS marine mammal thresholds from NMFS (2024) for a nominal sub-bottom profiling survey. An N/A indicates that the operational model produces the majority of the acoustic energy outside the hearing group sensitivity range.

Hearing group	Threshold for SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)	Nominal estimated horizontal distance (m) to SEL threshold		
		EdgeTech 424	EdgeTech 512	Knudsen 3202
PTS				
Low-Frequency (LF) cetaceans	183	*	*	28
High-frequency (HF) cetaceans	193	*	*	*
Very High-frequency (VHF) cetaceans	159	*	*	250
Otariid seals	185	*	*	19
TTS				
Low-Frequency (LF) cetaceans	168	*	*	808
High-frequency (HF) cetaceans	178	*	*	11
Very High-frequency (VHF) cetaceans	144	8	7	3974
Otariid seals	170	*	*	563

An asterisk indicates that the sound level threshold may not be reached.

In considering the sound levels from SBPs above, the per-pulse peak pressure source levels are close to most of the PK noise effect criteria thresholds (outlined in Section 1), and in some cases the reported sources levels are below PK criteria thresholds. Therefore, PK noise effect criteria thresholds may be exceeded but only within very close proximity to SBP sources. Indeed, the simple spreading loss model suggests that PK criteria for all marine mammal groups may be exceeded at very short horizontal distances from the considered SPB sources, ~2m and ~5 m for PTS and TTS, respectively. The spreading loss calculation predicts a maximum horizontal distance between 4 – 180 m for the marine mammal behavioural response criterion of 160 dB re 1 µPa (SPL; L_p).

The spreading loss distance estimates for the two EdgeTech SBPs in Table 7 are similar to those reported in McPherson and Wood 2017. However, for the higher-powered Knudsen 3202 system, the range estimates are larger than were reported in McPherson and Wood 2017. These results indicate the importance of considering the equipment and system specifications, as well as the way the equipment will be used operationally, in determining impact distances. Refer to Section 4 for additional context on fish and turtles.

3.2. Boomer Type Sub-bottom Profiler

As the boomer source had not been decided at the time of this assessment, a commonly-used representative system was considered, with levels derived from a previous JASCO field measurement

campaign. JASCO previously modelled a AP3000 triple-plate boomer (manufactured by Subsea Systems, Inc.) for a confidential client in the Gippsland region, and the modelling approach and results have been used to inform this assessment.

In that modelling study, the source was represented by scaling JASCO's measurement results from a source verification study on an AP3000 system Martin et al. (2012) from a double-plate configuration to a triple-plate configuration. This resulted in a source level of the AP3000 triple-plated boomer operating at 1800 J per pulse energy was calculated to be 169.0 dB 1 μPa^2m^2s.

In the modelling study a conservative sound speed profile that would be most supportive of sound propagation conditions for the period of the investigations was defined and applied, and single-impulse sound fields were predicted at a single location, and accumulated sound exposure fields were predicted for likely scenarios of geophysical investigations over 24 hours. The modelling methodology considered source directivity and range-dependent environmental properties in each of the areas assessed. Estimated underwater acoustic levels are presented as sound pressure levels (SPL, L_p), zero-to-peak pressure levels (PK, L_{pk}), peak-to-peak pressure levels (PK-PK; $L_{pk\text{-}pk}$), and either single-impulse (i.e., per-pulse) or accumulated sound exposure levels (SEL, L_E) as appropriate for different noise effect criteria. The analysis considered the distances away from the source or survey lines at which several effects criteria or relevant sound levels were reached.

Sound levels associated with the considered behavioural effect criteria are not reached beyond a distance of less than 10 m for the boomer, and no criteria associated with injury are reached.

The likelihood of fish being close enough to the sound source for physiological impacts to occur is considered remote (McPherson and Wood 2017). Behavioural impacts to fish from survey equipment noise will be limited to behavioural responses within metres of the noise source.

Crocker and Fratantonio (2016) reported source levels for several different SBPs. Table 8 provides nominal, but upper bound values for a triple plate boomer SBP extracted from Crocker and Fratantonio (2016). Units have been written to align with the updated ANSI and ISO standards for acoustic terminology, ANSI S1.1 (2013) and ISO 18405:2017 (2017).

Table 8. Sub-bottom profiler boomer source specifications, adapted from Crocker and Fratantonio (2016)

Equipment	Operational Mode	Frequency Bandwidth (kHz)	Source Level (dB re 1 µPa m)	Peak Source Level (dB re 1 µPa m)	Energy source level (dB re 1 μPa^2s m^2)	Beam Width (°)	Pulse Duration (ms)	Repetition Rate (Hz)[1]
Applied Acoustics S-Boom	700 J (three plates)	0.2-6.2	205	211	172	61	0.6	5

[1] Repetition rate proposed in considering specification documents and previous public information (Vineyard Wind and JASCO Applied Sciences 2020). These are nominal and depend on usage.

To compare with the discussion points in cited literature, in a similar procedure to estimate received levels and determine threshold exceedance ranges has been conducted. Like, the other source types considered in this report, received levels have been calculated based on an assumption of spherical spreading with absorption loss. The method is described in Appendix A. Table 9 presents the frequency weighted SEL PTS and TTS horizontal impact distance estimates for a nominal boomer sub-bottom survey (refer to Appendix A for calculation details and weighting curves can be found in Appendix B).

Table 9. Horizontal distances (m) for frequency-weighted SEL_{24h} based PTS and TTS marine mammal thresholds from NMFS (2024) for a nominal sub-bottom profiling survey. An N/A indicates that the operational model produces the majority of the acoustic energy outside the hearing group sensitivity range.

Hearing group	Threshold for SEL_{24h} ($L_{E,24h}$; dB re 1 µPa²·s)	Nominal estimated horizontal distance (m) to SEL threshold
		S-Boom (Triple Plate)
PTS		
Low-Frequency (LF) cetaceans	183	*
High-frequency (HF) cetaceans	193	*
Very High-frequency (VHF) cetaceans	159	2
Otariid seals	185	*
TTS		
Low-Frequency (LF) cetaceans	168	7
High-frequency (HF) cetaceans	178	*
Very High-frequency (VHF) cetaceans	144	36
Otariid seals	170	*

An asterisk indicates that the sound level threshold may not be reached.

The per-pulse peak pressure source levels are close to most of the PK noise effect criteria thresholds (outlined in Section 1). Therefore, PK noise effect criteria thresholds may be exceeded but only within very close proximity to SBP sources, if at all. The simple spreading loss model suggests that PK criteria for all marine mammal groups may be exceeded at very short horizontal distances from the considered SPB sources, ~1 m and ~3 m for PTS and TTS, respectively. The spreading loss calculation predicts a maximum horizontal distance of 90 m to the marine mammal behavioural response criterion of 160 dB re 1 µPa (SPL; L_p).

The spreading loss distance estimates for the Boomer SBP in Table 9 are similar to those reported in McPherson and Wood 2017, with the notable difference of the maximum horizontal distance to the marine mammal behavioural response estimated to be 90 m from the spreading loss model. These results reflect a slightly more conservative source parameterisation used with the spreading loss model. This results in slightly larger distances compared to those reported in the provided studies. Refer to Section 4 for additional context on fish and turtles.

4. Additional Results

Acoustic masking occurs when a sound impedes an animal's ability to perceive biologically relevant signals. Due to the context-specific nature of masking, there are not currently any noise effect criteria to assess against. Nonetheless, all of the considered survey equipment has the potential to cause masking of cetacean vocalisations due to their overlap with the frequency range produced by geophysical survey signals. Masking is most likely to affect high-frequency and very-high-frequency

cetaceans due to the overlap with their hearing sensitivities (refer to Appendix B) and sound emissions. However, due to the limited propagation range of the geophysical survey signals (high frequencies attenuate rapidly), in most cases the range at which the impact could occur will be small, typically within hundreds of meters.

Sound from HRG survey equipment would not result in physiological impacts to turtles located within metres of the sources considered above. This is because the sounds produced by the considered geophysical survey equipment are outside of the hearing frequency range for turtles, which for green and loggerhead turtles is approximately 50 – 2,000 Hz (Finneran et al. 2017), with highest sensitivity to sounds between 200 and 400 Hz (Ridgway et al. 1969, Ketten and Bartol 2005, Bartol and Ketten 2006, Bartol 2008, Yudhana et al. 2010, Piniak et al. 2011, Lavender et al. 2012, 2014).

Based on available criteria from Popper et al (2014), potential impacts of equipment on fish have been considered. Sound from HRG survey equipment could result in physiological impacts to fish located within metres of the sources considered above. However, the likelihood of fish being close enough to the sound source for physiological impacts to occur is considered remote.

4.1. Benthic Invertebrates

Research is ongoing into the relationship between sound and its effects on benthic invertebrates, including the relevant metrics for both effect and impact. Available literature suggests particle motion, rather than sound pressure, is a more important factor for crustacean and bivalve hearing. At the seafloor interface, crustaceans and bivalves are subject to particle motion stimuli from several acoustic or acoustically-induced waves. These include the particle motion associated with an impinging sound pressure wave in the water column (the incident, reflected, and transmitted portions), substrate acoustic waves, and interface waves of the Scholte type. However, it is unclear which aspect(s) of these waves is/are most relevant to the animals, there is not enough information to establish similar criteria and thresholds as done for marine mammals and fish. Including recent research, such as Day et al. (2016b), current literature does not clearly define an appropriate metric or identify relevant levels (pressure or particle motion) for an assessment. This includes the consideration of what levels of particle motion may lead to a behavioural response, or mortality. Therefore, at this stage, we cannot propose authoritative thresholds to inform the impact assessment.

In consideration of the evolving research, for crustaceans a PK-PK sound level of 202 dB re 1 µPa (Payne et al. 2008) is considered to be associated with no effect. Additionally for context related to different levels of potential impairment, the PK-PK sound levels of 209-212 dB re 1 µPa determined by Day et al. (2016b) as applied to crustaceans, and 213 dB re 1 µPa from Day et al. (2019), are also included. For bivalves, PK-PK sound levels of 212, and 213 dB re 1 µPa are presented to allow comparison to the maximum sound levels measured in Day et al. (2016a) and Day et al. (2017).

The while not reported here per-pulse peak to peak pressure source levels for the sources referenced in Crocker and Fratantonio (2016) are close to most of the PK-PK noise effect criteria thresholds and in some cases the reported sources levels are below PK-PK criteria thresholds. Therefore, PK-PK noise effect criteria thresholds for benthic invertebrates may be exceeded but only within very close proximity to HRG sources. Moreover, for hull mounted HRG equipment where the source is several tens or metres from the seabed it is unlikely for these types of HRG equipment to exceed the PK-PK criteria thresholds at the seafloor.

5. Summary

This technical summary should be used to provide context to potential impacts from geophysical surveying equipment that generally operate at high frequencies; here we consider side scan sonars

(SSSs) and sub-bottom profilers (SBPs). Estimates of horizontal effect distances are nominal and depend on what equipment is used and how it is configured.

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Appendix A. Calculation Methods

A.1. Empirical Spreading Loss Calculations

The general method specified in the Interim Recommendation for Sound Source Level and Propagation Analysis for High Resolution Geophysical (HRG) Sources (NOAA September 9, 2019) was followed to perform loss calculations. We note that there are an updated set of interim recommendations (Guan 2020) from the author of the 2019 guidance document. This updated method provides adjusted calculation methods to consider water depth in the prediction of the horizontal impact distance, the method described herein is equivalent to the case where the water depth is greater than the vertical component of the slant distance (see Figure 2 for a diagram). We have not considered water depth in the prediction of the horizontal impact distance, to allow for operational flexibility.

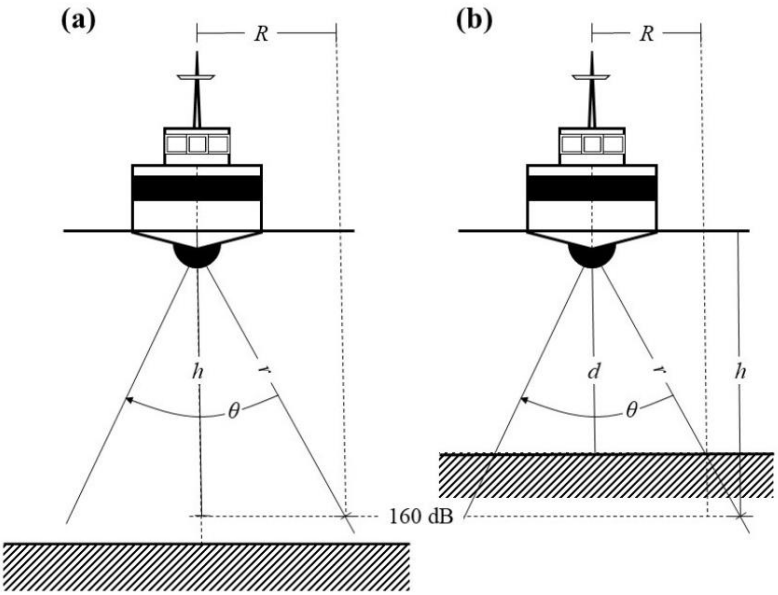


Figure 2. Excerpt from Guan (2020). The calculation methods described herein is equivalent to the left diagram labelled (a).

The calculation method is described as follows.

The sonar equation is used to calculate the received level:

$$RL(r) = SL - PL(r), \tag{1}$$

where RL is a generalised the pressure level (dB re 1 μPa or dB re 1 μPa^{2}s) and applies to PK, SPL and SEL calculations, r is the distance from the source (m), SL is the source level (dB re 1 μPa m or dB re 1 μPa^{2}s m), and PL is the propagation loss as a function of distance. Propagation loss is calculated using:

$$PL(r) = 20\log_{10}\left(\frac{r}{1\ \mathrm{m}}\right)\ \mathrm{dB} + \alpha(f)\cdot r/1000, \tag{2}$$

where $\alpha(f)$ is the absorption coefficient (dB/km) and f is frequency (kHz). The absorption coefficient is approximated by discarding the boric acid term from Ainslie (2010; p29; eq 2.2):

$$\alpha(f) \approx 0.000339 f^2 + 48.5 f^2/(75.6^2 + f^2)\,. \tag{3}$$

When a range of frequencies is produced by a source, the lowest frequency for determining the absorption coefficient was used.

A.2. Estimating Range to Thresholds Levels

Distances to PK thresholds and SPL criteria were calculated using the PK or SPL source level and applying propagation loss from Equation 2. The PK and SPL calculations were performed at radial distances *r*, which varied between 1 m and 10 km to determine when levels cross a threshold or exceed a criterion. For a downwards-pointing source with a beamwidth less than 180°, the horizontal impact distance (*R*) is calculated from the in-beam range using:

$$R = r \cdot \sin\left(\frac{\delta\theta}{2}\right), \tag{4}$$

where $\delta\theta$ is the beamwidth.

For the weighted SEL thresholds, the following steps were performed:

- Modelled propagation loss as a function of oblique range using Equation 2.
- Modelled per-pulse SEL for a stationary receiver at a fixed distance off a straight survey line, using a vessel transit speed and source-specific pulse length and repetition rate. The calculation considered, a vessel transit speed of 3.5 knot (~5 m/s) and a 20 km straight survey line track. The off-line distance is referred to as the closest point of approach (CPA) and was performed for CPA distances between 1 m and 10 km. The survey line length was modelled as 10 km long (analysis showed longer survey lines increased SEL by a negligible amount). SEL is calculated as $SPL + 10\log_{10}\frac{T}{1\,\mathrm{s}}\ \mathrm{dB}$, where T is the pulse duration. A flat spectrum between the source minimum and maximum frequency is assumed, which was weighted according to the marine mammal hearing group weighting function (NMFS (2024)) and summed across frequency.
- Calculated the SEL for each survey line to produce curves of weighted SEL as a function of CPA distance.
- Used the curves from Step 4 to estimate the CPA distance to the threshold.
- This method accounts for the hearing sensitivity of the marine mammal group and seawater absorption for downwards-facing transducers.

Appendix B. Marine Mammal Frequency Weighting

The potential for noise to affect animals depends on how well the animals can hear it. Noises are less likely to disturb or injure an animal if they are at frequencies that the animal cannot hear well. An exception occurs when the sound pressure is so high that it can physically injure an animal by non–auditory means (i.e., barotrauma). For sound levels below such extremes, the importance of sound components at particular frequencies can be scaled by frequency weighting relevant to an animal's sensitivity to those frequencies (Nedwell and Turnpenny 1998, Nedwell et al. 2007).

B.1.1. Marine Mammal Frequency Weighting Functions

In 2015, a US Navy technical report by Finneran (2015) recommended new auditory weighting functions. The overall shape of the auditory weighting functions is similar to human A–weighting functions, which follows the sensitivity of the human ear at low sound levels. The new frequency–weighting function is expressed as:

$$G(f) = K + 10\log_{10}\left[\left(\frac{(f/f_{lo})^{2a}}{\left[1+(f/f_{lo})^{2}\right]^{a}\left[1+(f/f_{hi})^{2}\right]^{b}}\right)\right] \quad \text{(B–1)}$$

Finneran (2015) proposed five functional hearing groups for marine mammals in water: low–, mid– and high–frequency cetaceans (LF, MF, and HF cetaceans, respectively), phocid pinnipeds, and otariid pinnipeds. The parameters for these frequency–weighting functions were further modified the following year (Finneran 2016) and were adopted in NOAA's technical guidance that assesses acoustic impacts on marine mammals (NMFS 2018), and in the latest guidance by NMFS (2024). The updates did not affect the content related to either the definitions of frequency–weighting functions or the threshold values, however, the terminology for mid– and high–frequency cetaceans was changed to high– and very high–frequency cetaceans (VHF cetaceans). Table B–1. lists the frequency–weighting parameters for each hearing group relevant to this assessment, and Figure B–1 shows the resulting frequency–weighting curves.

Table B–1. Parameters for the auditory weighting functions used in this project as recommended by NMFS (2024).

Functional hearing group	NMFS (2024)				
	a	b	f_1 (Hz)	f_2 (Hz)	K[1] (dB)
Low-frequency cetaceans	0.99	5	168	26,600	0.12
High-frequency cetaceans	1.55	5	1,730	129,000	0.32
Very high-frequency cetaceans	2.23	5	5,930	186,000	0.91
Otariid pinnipeds underwater	1.58	5	2530	43,800	1.37

[1] In NMFS (2018) and NMFS (2024), this constant is symbolized by C.

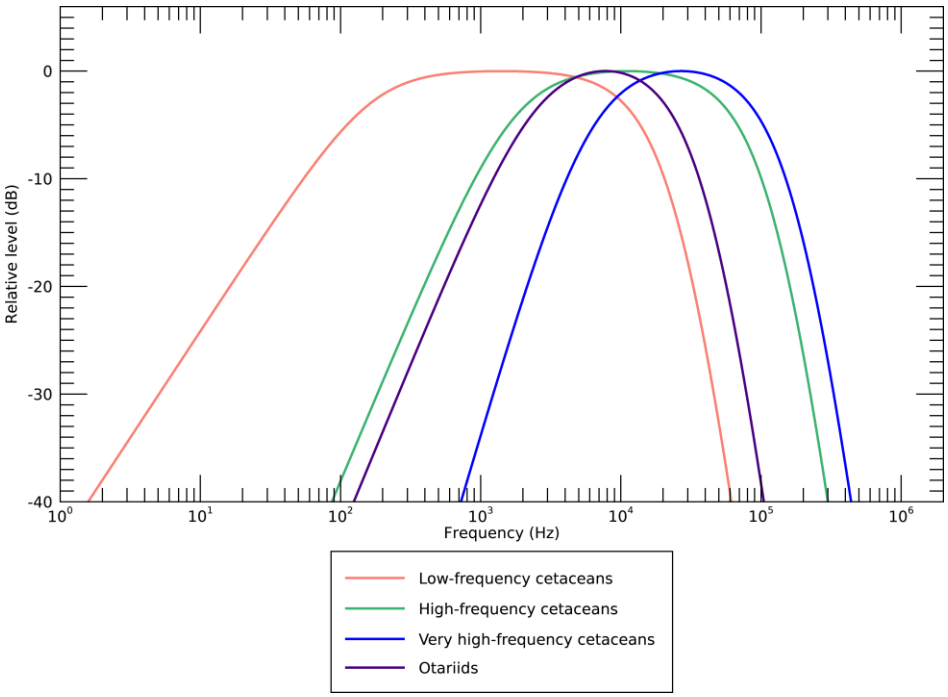


Figure B–1. Auditory weighting functions for functional marine mammal hearing groups used in this project as recommended by NMFS (2024).