Gorgon Gas Development
Geryon and Eurytion Drilling Environment Plan

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1 Environment Plan summary

In accordance with regulations 28 and 35 of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023 (Commonwealth [Cth]) (OPGGS(E)R) all Environment Plans (EPs) are published (with the sensitive information part removed) on the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) website.

To fulfil the requirements of an EP summary for public disclosure, as required by regulations 35(6) and 35(7), Table 1-1 has been prepared from material provided in this EP, and in the EP summary statement format preferred by NOPSEMA (Ref. 1).

Table 1-1: Environment Plan summary

Regulation	EP summary material requirement	Relevant section of this EP
35(7)(a)(i)	the location of the activity	Sections 2.2 and 4.1.1
35(7)(a)(ii)	a description of the receiving environment	Section 5
35(7)(a)(iii)	a description of the activity	Section 4
35(7)(a)(iv)	details of environmental impact and risks	Section 8
35(7)(a)(v)	a summary of control measures for the activity	Section 8
35(7)(a)(vi)	a summary of the arrangements for ongoing monitoring of the titleholder's environmental performance	Section 10
35(7)(a)(vii)	a summary of the response arrangements in the oil pollution emergency plan	Section 10.3.9, 9.4 and Ref. 2
35(7)(a)(viii)	details of consultation already undertaken, and plans for ongoing consultation	Sections 7 and 10.3.4
35(7)(a)(ix)	details of the titleholder's nominated liaison for the activity	Section 2.4

2 Introduction

2.1 Overview

Chevron Australia Pty Ltd (CAPL), acting on behalf of the Gorgon Joint Venturers, is the operator of the Gorgon Gas Development, located off the northwest coast of Western Australia (WA).

The first phase of the Gorgon Gas Development, the Gorgon Foundation Project[1] (GFP), comprises the production of natural gas from the Gorgon and Jansz-Io fields. Hydrocarbon is transported from the offshore gas fields via two subsea pipeline networks to the Gas Treatment Plant (GTP) on Barrow Island, where it is processed for export as liquefied natural gas (LNG) or piped to the mainland for WA domestic gas users. This phase of the Gorgon Gas Development commenced operation in 2015.

The next phase of the development, the Backfill Fields Development, comprises the production of natural gas from seven backfill fields: Chandon, Chrysaor, Dionysus, Eurytion, Geryon, Semele, and West Tryal Rocks. The purpose of the Backfill Fields Development is to maintain gas supply to the existing GTP on Barrow Island to sustain production rates of LNG and domestic gas. All the backfill fields are subsea tie-back developments connecting to GFP infrastructure. These backfill fields are covered by the *Gorgon Gas Development: Backfill Fields Offshore Project Proposal (*Ref. 3) which was accepted by NOPSEMA in October 2025.

The first of the backfill fields to be developed are the Geryon and Eurytion (G&E) gas fields, referred to as Gorgon Stage 3 (GS3). CAPL is proposing to drill six new subsea production wells clustered around a single drilling centre (DC) within the G&E fields. This EP documents the assessment and management of potential environmental impacts and risks associated with GS3 drilling campaign, as well as contingency inspection, maintenance, and repair (IMR) activities conducted in Commonwealth waters.

This EP has been prepared and submitted to NOPSEMA in accordance with the requirements of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) (OPGGS Act) and the OPGGS(E)R.

2.2 Location

The G&E gas fields are located in the Northern Carnarvon Basin and ~80 km offshore from the closest island (Montebello Islands) and ~184 km from Onslow on the mainland coast (Figure 2-1).

The proposed production wells are located within production licence WA-66-L. See Section 4.1.1 for definition of the ‘Operational Area’ (OA) for the petroleum activity.

[1] The GFP includes the Gorgon Stage 2 (GS2) infill development and the Jansz-Io Compression (J-IC) Project.

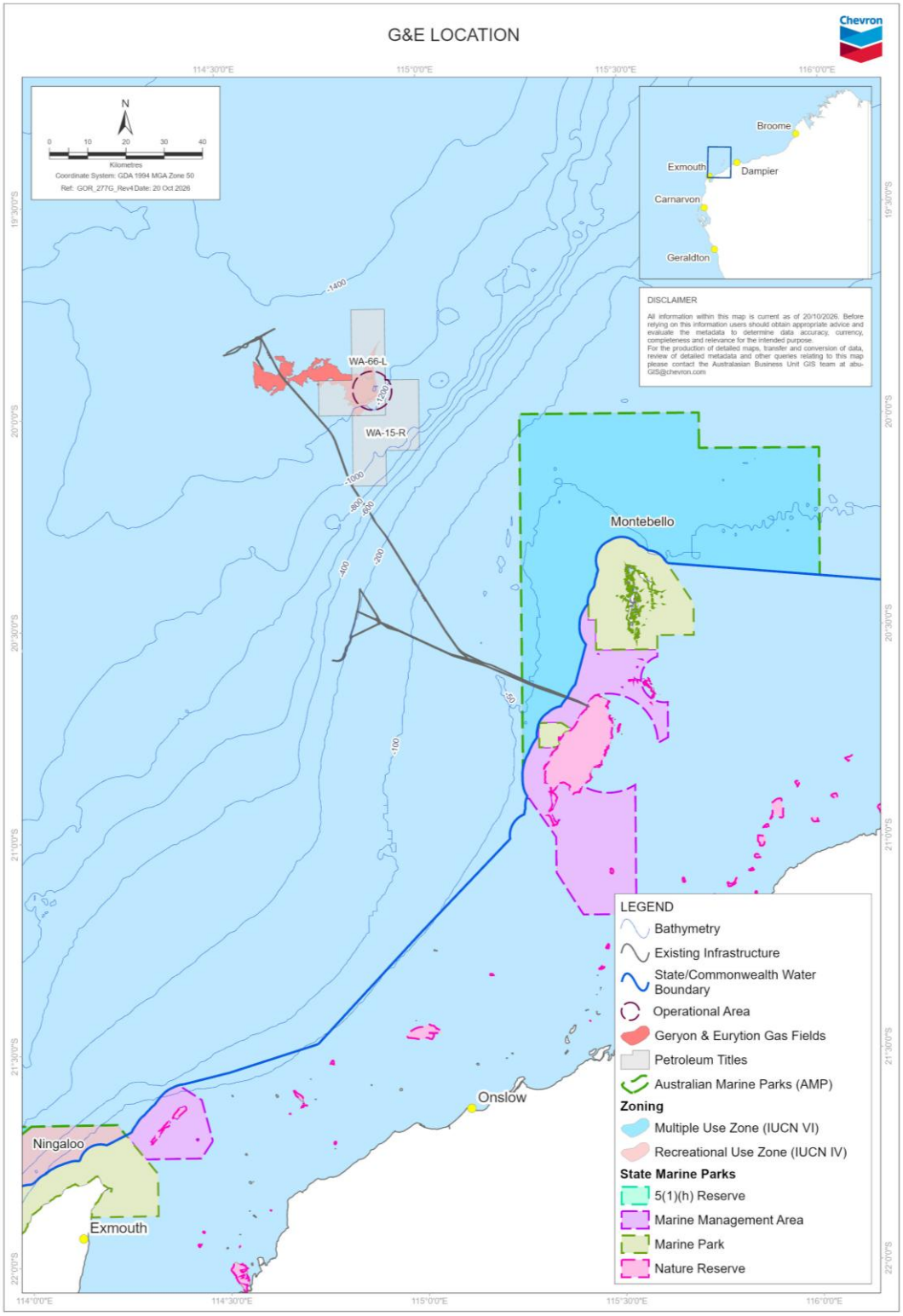


Figure 2-1: G&E drilling location

2.3 Scope

2.3.1 In scope

This EP addresses activities in Commonwealth waters associated with the proposed petroleum activity, including:

- drilling and completions
- contingency IMR
- support activities.

2.3.2 Outside of scope

The following activities are excluded from the scope of this EP:

- vessels (including emergency response vessels) operating outside of the OA (e.g. transiting to or from the OA); these vessels are subject to the *Navigation Act 2012* (Cth) and not performing the petroleum activity
- helicopters operating outside of the OA (e.g. transiting to or from the OA); these aircraft are subject to the *Air Navigation Act 1920* (Cth) and *Civil Aviation Act1998* (Cth) and not performing the petroleum activity
- commissioning, start-up and operations of GS3 infrastructure
- end of facility life (EOFL) decommissioning.

2.4 Titleholder details

In accordance with regulations 23(1) and 23(2) of the OPGGS(E)R, details of the titleholders and nominated liaison are provided in Table 2-1 and Table 2-2 respectively.

Regulation 23(3) of the OPGGS(E)R requires that CAPL notifies NOPSEMA of a change in the titleholder, a change to the titleholder's nominated liaison, or a change in the contact details for either the titleholder or the nominated liaison.

Regulation 286A of the OPGGS Act requires notification is provided to NOPSEMA and the National Offshore Petroleum Titles Administrator (NOPTA) if there is a change to a registered titleholder or contact details for a registered titleholder; this notification is to occur within 30 days of such a change.

Table 2-1: Titleholder details

Title	Type	Titleholders	Operator
WA-66-L	Production Licence	Chevron Australia Pty Ltd Mobil Australia Resources Company Pty Limited Shell Australia Pty Ltd Osaka Gas Gorgon Pty Ltd MidOcean Gorgon Pty Ltd JERA Gorgon Pty Ltd	Chevron Australia Pty Ltd Business address: 1 The Esplanade, Perth WA 6000 Telephone: +61 8 9216 4000 Fax: +61 8 9216 4444 ACN: 086 197 757

Table 2-2: Details of nominated liaison

Name	Ian Nott
Position	General Manager – Wells
Business Address	1 The Esplanade, Perth WA 6000
Telephone	+61 8 9216 4000
Email	feedback@chevron.com

3 Environmental management framework

3.1 Corporate framework

CAPL's operations are managed in accordance with Chevron Corporation's Operational Excellence Management System (OEMS), which is described in Section 10.

3.1.1 Environmental policy

CAPL's commitment to environmental management in all aspects of operations is documented in Chevron Corporation's Operational Excellence (OE) Policy 530 (Appendix A).

3.2 Relevant requirements

This section provides a description of the requirements, including legislative requirements, that apply to the petroleum activity and are relevant to the environmental management of the petroleum activity as required by regulation 21(4) of the OPGGS(E)R.

3.2.1 Offshore Petroleum and Greenhouse Gas Storage Act 2006

The OPGGS Act and associated regulations provides the legal framework for the exploration and recovery of petroleum in offshore areas[2]. Regulations made under this Act include the OPGGS(E)R and the Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2025 (OPGGS(RMA)R.

The object of the OPGGS(E)R is to ensure that any petroleum activity carried out in an offshore area is carried out in a manner:

- consistent with the principles of ecologically sustainable development (ESD) set out in section 3A of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act)
- by which the environmental impacts and risks of the activity will be reduced to as low as reasonably practicable (ALARP)
- by which the environmental impacts and risks of the activity will be of an acceptable level.

Part 4 of the OPGGS(E)R describes requirements relating to EPs, including the requirement for a titleholder to have an accepted EP in place prior to the commencement of any petroleum activity in an offshore area (Division 1); the content requirements of an EP (Division 2); and the consultation requirements during preparation of an EP (Division 3).

Division 4 of Part 4 of the OPGGS(E)R describes the submission process of an EP. In particular, regulation 26(3) provides that a titleholder may submit an EP for a petroleum activity that is, or is part of, an offshore project[3], only if:

- there is a NOPSEMA accepted OPP that includes that petroleum activity, or

[2] The OPGGS Act defines an 'offshore area' as (a) starts 3 nautical miles (nm) from the baseline from which the breadth of the territorial sea is measured, and (b) extends seaward to the outer limits of the continental shelf.

[3] The OPGGS(E)R defines an 'offshore project' as one or more activities that are undertaken for the purpose of the recovery of petroleum, other than on an appraisal basis, including any conveyance of recovered petroleum by pipeline (whether or not the activity is undertaken for other purposes).

- the Commonwealth Environment Minister has:
  - made a decision under section 75 of the EPBC Act that an action that is equivalent to or includes the activity is not a controlled action, or
  - made a component decision under section 77A of the EPBC Act that a particular provision of Part 3 of that Act is not a controlling provision for an action that is equivalent to or includes the activity, because the Environment Minister believes the action will be taken in a particular manner, or
  - approved, under Part 9 of the EPBC Act, the taking of an action that is equivalent to or includes the activity.

This EP[4] has been prepared in accordance with the relevant content and consultation requirements of the OPGGS(E)R. The petroleum activity covered by this EP is considered part of the offshore project described within the *Gorgon Gas Development: Backfill Fields Offshore Project Proposal* (Ref. 3), which was accepted by NOPSEMA in October 2025[5].

A concordance table for relevant requirements from the OPP that are relevant to the petroleum activity within this EP are summarised in Appendix B.

Part 5 of the OPGGS(RMA)R describes requirements relating to well integrity and a Wells Operations Management Plan (WOMP). An accepted WOMP must be in place prior to a titleholder undertaking well activity.

3.2.2 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act and the Environment Protection and Biodiversity Conservation Regulations 2025 (EPBC Regulations) are Australia's main national environmental legislation, and provide for the protection and management of nationally and internationally important plants, animals, habitats, and places. The objects of the EPBC Act include:

- to provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance (MNES)
- to promote ESD through the conservation and ecologically sustainable use of natural resources
- to promote the conservation of biodiversity
- to provide for the protection and conservation of heritage.

Under section 146B of the EPBC Act, the Commonwealth Minister for the Environment endorsed the environmental management authorisation process for offshore petroleum and greenhouse gas activities administered by NOPSEMA under the OPGGS Act and the OPGGS(E)R ('the Program') in February 2014. The effect of this streamlined environmental approvals process is that petroleum activities within the classes of actions covered by the Program are no longer subject to a separate environmental approval process under the EPBC Act, as the NOPSEMA-administered OPGGS(E)R process is treated as an accredited process for those actions (Ref. 4). The Program ensures that potential impacts

[4] The EP submission also includes an Oil Pollution Emergency Plan (OPEP; Ref. 2) and Operational and Scientific Monitoring Bridging Implementation Plan (OSM-BIP; Ref. 5)

[5] The Backfill Fields Development OPP is publicly available on NOPSEMA's website: https://docs.nopsema.gov.au/A1265361

and risks to matters protected under Part 3 of the EPBC Act are assessed and managed so that they are not unacceptable (Ref. 4).

3.2.2.1 Recovery plans, conservation advices, threat abatement plans, and wildlife conservation plans

Under Part 13 of the EPBC Act, listed threatened species and ecological communities are managed through recovery plans, conservation advices, or threat abatement plans; and listed migratory, marine, cetacean or conservation dependent species are managed through wildlife conservation plans. These instruments provide guidance on threats (or threatening processes) and recommend management and mitigation actions.

Of these instruments, recovery plans are legally binding on the Australian Government; i.e. once a recovery plan is in place, Australian Government agencies must act in accordance with that plan. The other instruments (conservation advices, threat abatement plans, and wildlife conservation plans) provide guidance that informs proponents and the Australian Government.

The relevant requirements of these instruments and where these have been considered within the EP are summarised in Appendix C.

3.2.3 Other commonwealth legislation

Table 3-1 summarises other Commonwealth legislation relevant to the environmental management of the petroleum activity.

3.2.4 State legislation

Although the petroleum activity occurs in Commonwealth waters, some State legislation is also relevant to the environmental management of the petroleum activity (Table 3-2).

3.2.5 Policies and guidelines

Table 3-3 summarises Australian Government and/or international policies and guidelines that are relevant to the environmental management of the petroleum activity.

Table 3-1: Commonwealth legislative requirements

Legislation	Description	Applicability to environmental management of the petroleum activity	Demonstration of how/where requirements are met
Australian Maritime Safety Authority Act 1990	The objects of this Act include: • promote maritime safety • protect the marine environment from pollution from ships or other environmental damage caused by shipping • provide for a national search and rescue service.	Requirements include the involvement of the Australian Maritime Safety Authority (AMSA) in response to relevant spill events.	Roles and responsibilities are described in the OPEP (Ref. 2).
Biosecurity Act 2015 Biosecurity Regulations 2016	The objects of this Act include to provide for the managing of: • biosecurity risks • risks related to ballast water. The Act also gives effect to Australia's international obligations under the Ballast Water Convention, and the United Nations Convention on the Law of the Sea.	Pre-arrival reporting (PAR) prior to arrival in Australian territory.	Section 8.12.
		Ballast water and biofouling management.	Section 8.12.
Industrial Chemicals Environmental Management (Register) Act 2021 Industrial Chemicals Environmental Management (Register) Instrument 2022	This Act provides for the establishment of the Industrial Chemicals Environmental Management Standard (IChEMS) and its associated Register. The IChEMS establishes nationally consistent standards for managing the import, manufacture, export, use, and disposal of industrial chemicals. Industrial chemicals will be listed on the IChEMS Register in one of seven schedules according to their environmental risk. The regulation and enforcement of IChEMS relies on the Commonwealth, States and Territories adopting them into their environmental laws.	Risk management measures identified under IChEMS may have implications for the use or disposal of industrial chemicals during the petroleum activity[6]	Sections 8.8 and 8.9.
National Greenhouse and Energy Reporting Act 2007 (NGER Act)	This Act establishes the national scheme for the reporting of GHG emissions, energy production and energy consumption.	Facilities that trigger the 100,000 t pa $CO_{2\text{-}e}$ Safeguard Mechanism threshold will need to comply with requirements of the Act, including energy and GHG reporting, and meeting any	Section 8.4.

[6] Note: Planned discharges to the marine environment are subject to selection and environmental assessment as per CAPL's *Hazardous Materials Management Procedure* (Ref. 181).

Legislation	Description	Applicability to environmental management of the petroleum activity	Demonstration of how/where requirements are met
National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Safeguard Rule)	The emissions reductions established under the Safeguard Mechanism are designed to deliver emissions reductions consistent with Australia's NDC under the Paris Agreement.	net emissions targets or baselines. Any new gas fields, as defined under the Safeguard Rule, will be required to meet net-zero reservoir carbon emissions.	
Navigation Act 2012 Various marine orders	Provides standards regarding collision prevention for vessels. The Navigation Act provides the legislative power for Australia to implement several international conventions, including the Convention on the International Regulations for Preventing Collisions at Sea (COLREGS) and the International Convention for the Safety of Life at Sea (SOLAS).	Notice to Mariners.	Sections 8.1, 8.15 and 8.16.
		Marine Order 15: Construction—Fire protection, fire detection and fire extinction.	Section 8.8.
		Marine Order 27: Safety of navigation and radio equipment.	Sections 8.1, 8.15 and 8.16.
		Marine Order 28: Operations standards and procedures.	Sections 8.1, 8.15 and 8.16.
		Marine Order 30: Prevention of collisions.	Section 8.15.
Navigation Act 2012 *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* *Protection of the Sea (Harmful Anti-fouling Systems) Act 2006* Various marine orders	Gives effect to the requirements under the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) in Australia.	Marine Order 91: Marine pollution prevention — oil.	Sections 8.14, 8.15 and 8.16.
		Marine Order 95: Marine pollution prevention — garbage.	Section 8.13.
		Marine Order 96: Marine pollution prevention — sewage.	Section 8.8.
		Marine Order 97: Marine pollution prevention — air pollution.	Sections 8.3 and 8.4.
		Marine Order 98: Marine pollution prevention — antifouling systems.	Section 8.12.
Underwater Cultural Heritage Act 2018 (UCH Act)	This Act protects the heritage values of shipwrecks, sunken aircraft, and relics (>75 years old) in Australian Commonwealth waters from the low water mark to the outer edge of the continental shelf (excluding the State's internal waterways).	Identification of the presence of protected cultural heritage sites and assessment of any impacts and risks to these sites.	Sections 5, 8.2 and 8.11.

Legislation	Description	Applicability to environmental management of the petroleum activity	Demonstration of how/where requirements are met
	The Act allows for protection through the designation of protection zones. Activities and conduct prohibited within each zone will be specified.		

Table 3-2: State legislative requirements

Legislation	Description	Applicability to environmental management of the petroleum activity	Demonstration of how/where requirements are met
Aboriginal Heritage Act 1972	This Act recognises and protects Aboriginal cultural sites and objects of significance. Approval is required for activities that adversely impact Aboriginal cultural sites.	Identification of the presence of Aboriginal cultural heritage sites and assessment of potential impacts and risks.	Sections 5, 8.15 and 8.16.
Conservation and Land Management Act 1984 (CALM Act)	This Act regulates the use, protection and management of certain public lands and waters, including the conservation of flora and fauna within those areas.	Identification of State marine or terrestrial protected areas managed under the CALM Act and, where relevant, assessment of potential impacts and risks.	Sections 5, 8.15 and 8.16.

Table 3-3: Policies and guidelines

Policy or guideline	Description	Applicability to environmental management of the petroleum activity	Demonstration of how/where requirements are met/applied
Assessing and Managing Impacts to Underwater Cultural Heritage in Australian Water (Ref. 9)	Provides guidance on identifying, assessing, and protecting underwater cultural heritage. Includes guidance proponents can comply with the UCH Act.	Guidance in the identification of the presence of protected cultural heritage sites and assessment of any impacts and risks to these sites. Used as guidance for CAPL's *Inadvertent Underwater Cultural Heritage Discovery Procedure* (Ref. 214).	Sections 5, 8.2 and 8.11.
Australian Ballast Water Management Requirements (Ref. 10)	Provides guidance on how vessel operators should manage ballast water when operating within Australian seas in order to comply with the *Biosecurity Act 2015* (Cth). They also align to the International Convention for the Control and Management of Ships' Ballast Water and	Ballast water management requirements for vessels, including having a ballast water management plan and certificate (unless an exemption applies)	Section 8.12

Policy or guideline	Description	Applicability to environmental management of the petroleum activity	Demonstration of how/where requirements are met/applied
	Sediments 2004 (the Ballast Water Management Convention)		
Australian Biofouling Management Requirements (Ref. 11)	Sets out vessel operator obligations for the management of biofouling when operating vessels under biosecurity control within Australian territorial seas	Biofouling management for vessels, including PAR, and having biofouling management plans	Section 8.12
Control and Management of Ships' Biofouling to Minimise the Transfer of Invasive Aquatic Species (Ref. 12)	International Maritime Organization (IMO) guidelines for controlling and managing ships' biofouling to minimise the transfer of invasive aquatic species	Requires a biofouling management plan and record book to be available and maintained	Section 8.12
Antifouling and In-water Cleaning Guidelines for Australia and New Zealand (Ref. 13) Australian anti-fouling and in-water cleaning guidelines: exposure draft (Ref. 14)	Provides best-practice approaches to applying, maintaining, removing, and disposing of antifouling coatings and the cleaning of biofouling on vessels and movable structures in Australia and New Zealand. Note: Once finalised, the 2024 exposure draft guidelines will replace the previous 2015 guidelines.	Requires a biofouling management plan and record book to be available and maintained as well as an anti-fouling system certificate or declaration on anti-fouling system	Section 8.12
Minamata Convention on Mercury (Ref. 15)	The Minamata Convention on Mercury is an international treaty that seeks to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds Australia ratified the Convention in December 2021	Article 9 of the Convention concerns controlling, and where feasible, reducing releases of mercury or mercury compounds to land and water. Article 11 of the Convention concerns disposal of mercury contaminated waste	Section 8.9
National Biofouling Management Guidance for the Petroleum Production and	A voluntary biofouling management guidance document has been developed to assist industry manage the risk of marine pest translocation and introduction via biofouling	Guidance for evaluating the biofouling risk of types of structures and facilities; and on biofouling management and decommissioning. Used as guidance for CAPL's *Quarantine Procedure Marine Vessels* (Ref. 185).	Section 8.12

Policy or guideline	Description	Applicability to environmental management of the petroleum activity	Demonstration of how/where requirements are met/applied
Exploration Industry (Ref. 16)			
National Light Pollution Guidelines for Wildlife (Ref. 17)	Outlines the process to be followed where there is the potential for artificial lighting to affect light-sensitive wildlife. Applies to new projects, lighting upgrades, and where there is evidence of wildlife being affected by existing artificial light	Guidance for impact assessment, and identifying management tools to minimise and mitigate impacts and risks from artificial light to light-sensitive species.	Section 8.5

4 Description of the petroleum activity

4.1 Overview

This section provides a description of the petroleum activity as required under regulation 21(1) of the OPGGS(E)R and is presented in the following sub-sections:

- drilling campaign—includes drilling, formation evaluation, subsea tree installation, well completions, and contingency activities (Section 4.2)
- contingency inspection, maintenance, and repair (IMR)—includes any subsea inspections or well intervention activities that may be required prior to commissioning, start-up and operations (Section 4.3)
- decommissioning—overview of early decommissioning planning and regulatory obligations (Section 4.4)
- field support—includes use of mobile offshore drilling unit (MODU), vessels, helicopters, and remotely operated vehicles (ROVs) or autonomous underwater vehicles (AUVs) to support above activities (Section 4.4).

4.1.1 Operational area

The proposed G&E well top-holes and targets are located within production licence WA-66-L in Commonwealth waters. The indicative location of the six G&E wells are shown in Table 4-1 and Figure 4-1.

The OA for the petroleum activity is defined as an ~5 km radius buffer around the indicative top-hole locations for the G&E wells (Figure 4-1). The OA occurs predominantly within production licence WA-66-L with a small overlap into CAPL's adjacent retention lease WA-15-R. Note: Only vessel-based activities are planned within WA-15-R. There are no islands or other emergent features within or adjacent to the OA.

The petroleum activity described within Section 4 of this EP will be undertaken wholly within the OA. The OA encompasses a 500 m safety navigation area (SNA) that will be requested around the MODU for the duration of the petroleum activity.

No petroleum safety zone (as administered via Part 6.6 of the OPGGS Act) will be established for the G&E wells.

Table 4-1: Coordinates and approximate water depths for the indicative top-hole locations of the G&E wells

Well name	Approximate water depth (m)	Coordinates (GDA94)*	
		Latitude	Longitude
GE-1B	1,221	19°56'24.08" S	114°53'03.67" E
GE-1C	1,221	19°56'23.91" S	114°53'04.82" E
GE-1D	1,221	19°56'24.87" S	114°53'05.04" E
GE-1E	1,221	19°56'26.76" S	114°53'07.91" E
GE-1F	1,221	19°56'26.63" S	114°53'08.96" E
GE-1G	1,221	19°56'27.55" S	114°53'09.29" E

** Note that exact well location may vary depending on final design considerations; however, all well top holes will be located within the production licence WA-66-L in the OA.*

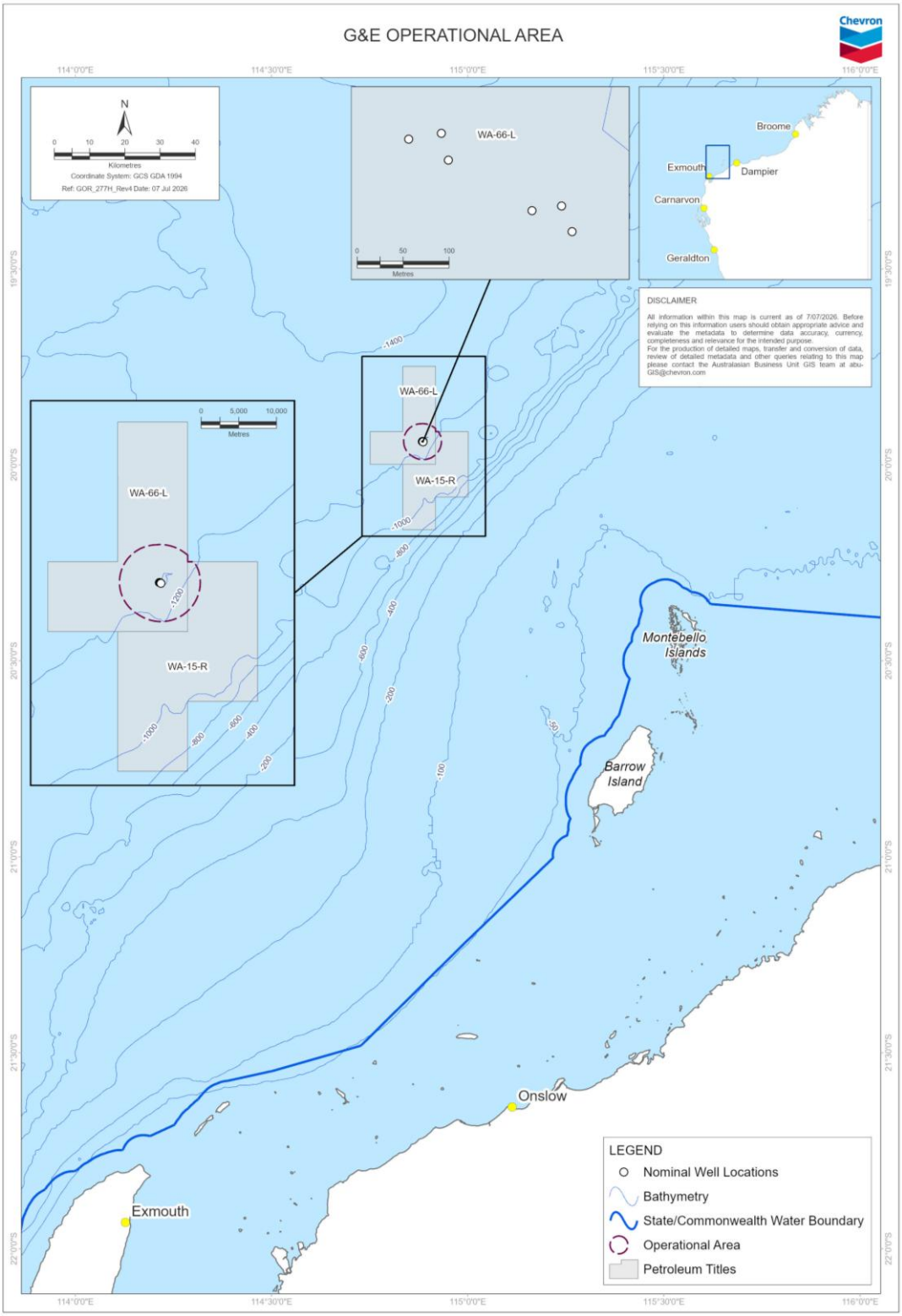


Figure 4-1 G&E OA

4.1.2 Timing

The G&E drilling campaign is indicatively scheduled to commence from early-2027 and are estimated to take ~12–18 months to complete, with activities occurring either over a single or multiple campaigns. These schedules and durations are indicative and subject to potential delays caused by MODU/vessel, infrastructure, and/or equipment availability, regulatory approvals, weather events, or other unforeseen factors. Therefore, the drilling campaign may occur at any time during the 5-year in-force period of this EP.

IMR activities are not planned to occur during the in-force period of this EP; however, they are included as a contingency, if required. For the purposes of assessing potential environmental impacts and risks in this EP, CAPL has allowed for one well intervention (estimated to take ~50 days) and ~ 7 days of subsea inspections to occur during the in-force period of this EP.

Petroleum activities covered within this EP can be conducted 24 hours/day and 7 days/week.

The EP has evaluated potential impacts and risks associated with the petroleum activity occurring at any time during the day (i.e. 24 hours a day) and at any time during the year (i.e. during any season) to provide operational flexibility for potential schedule changes.

4.1.3 Reservoir properties

The Geryon gas field consists of three stacked reservoirs separated by mudstones. The Eurytion gas field consists of two shallow reservoirs. The five Geryon wells (GE-1C, GE-1D, GE-1E, GE-1F, GE-1G) will each produce from a single-zone reservoir, while the Eurytion well (GE-1B) will co-mingle production from two shallow reservoirs. Slot assignments for these wells are indicative and may be subject to change to accommodate design considerations.

The hydrocarbon composition within the respective gas fields are expected to be similar, and are summarised in Table 4-2.

All six wells have a steady-state design gas rate of ~270 MMscfd, with initial transient rates up to ~320 MMscfd.

Table 4-2: Primary inert and hydrocarbon composition (mol%)

Component	Geryon	Eurytion
Carbon dioxide (CO_2)	1.17	0.59
Nitrogen (N_2)	2.09	2.27
C1 Hydrocarbons	88.83	89.60
C2 Hydrocarbons	4.53	4.48
C3 Hydrocarbons	1.63	1.57
≥C4 Hydrocarbons	1.75	1.49

4.2 Drilling and completions

4.2.1 Well design and drilling method

An indicative overview of the base-case drilling design and method for the G&E wells is provided in Table 4-3. Drilling operations will follow a standard batch drilling approach (i.e. the six wells will be drilled together in phases; Figure 4-2).

The proposed drilling method uses water-based fluids (WBFs); non-aqueous drill fluids (NADFs) may be used as a contingency (Table 4-3).

The design and methods are subject to change, depending on individual well design requirements and final well location. Final well design and well schematics will be provided in the WOMP (Ref. 6; Ref. 7; Ref. 8), which will be submitted to NOPSEMA for acceptance prior to drilling activities commencing.

Table 4-3: Indicative base-case design and method for G&E wells

Hole size		Casing size		Cuttings discharge location	Drill fluid type
in	mm	in	mm		
42	~1,067	36	~914	Seabed	WBF
26	~660	20	~508	Seabed	WBF
17½	~444	13⅝	~346	Surface	WBF*
12¼	~311	9⅝	~244	Surface	WBF*
8½	~216	Open-hole gravel pack (OHGP)		Surface	WBF*

** NADF may be used as a contingency for these bottom hole sections.*

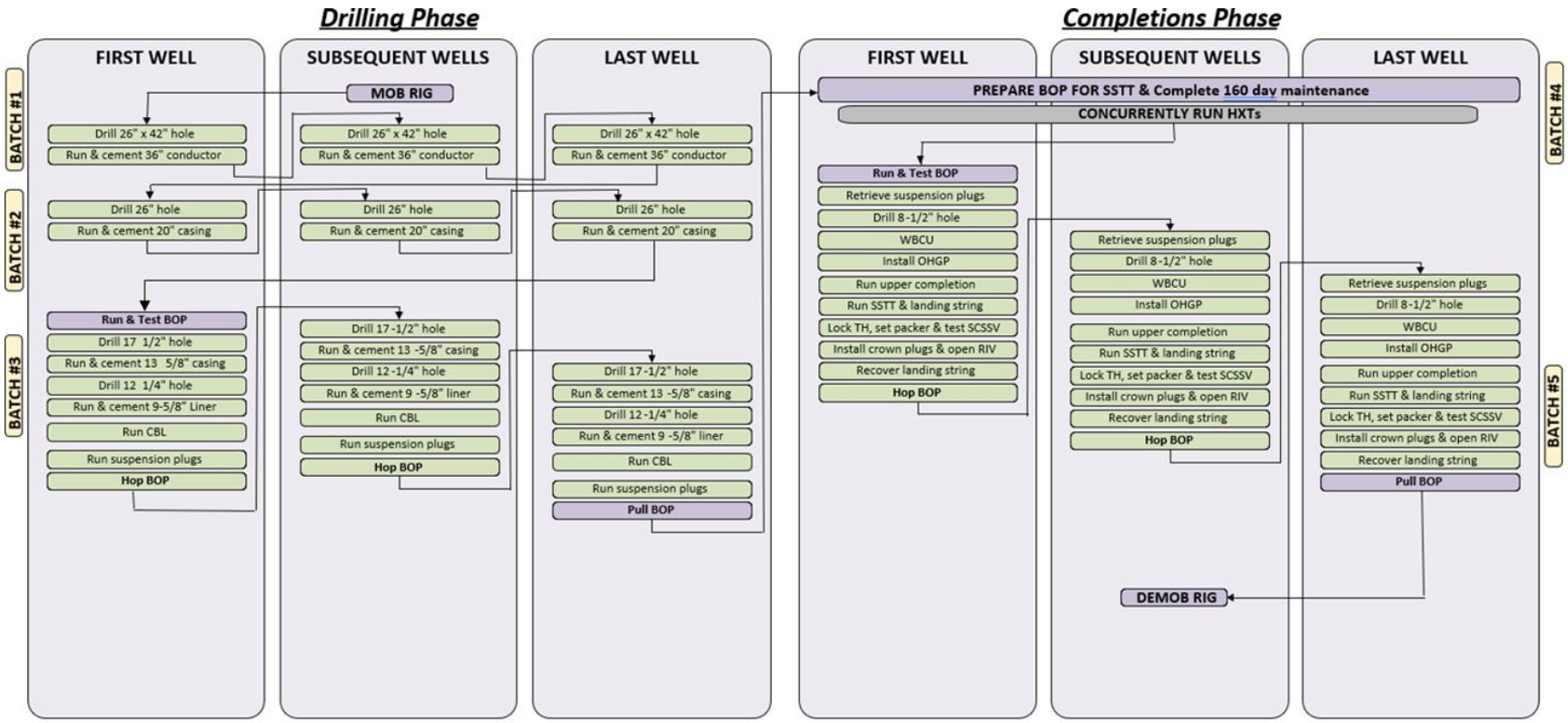


Figure 4-2: Overview of indicative batch drilling operations

4.2.2 Drilling fluids and cuttings handling and disposal

The top-hole (42" and 26") sections will be drilled with seawater and WBFs (high viscosity sweeps), with cuttings circulated to the seabed.

The high viscosity sweeps may comprise a high percentage of drill water, with the remaining percentage made up of drilling fluid additives that are either completely inert in the marine environment, naturally occurring benign materials, or readily biodegradable organic polymers with a very fast rate of biodegradation in the marine environment. Drilling additives typically used include potassium chloride, bentonite (clay), water soluble polymers, barite, and calcium carbonate.

Once the top-hole sections are complete for all batch wells (Figure 4-2), installation of the riser and blowout preventer (BOP) provides a conduit back to the MODU, forming a closed circulating system. Primary and secondary solids control equipment (SCE) onboard the MODU removes cuttings from drilling fluids before being recirculated back to the well. SCE may include:

- shale shakers
- centrifuge(s)
- cuttings dryer (if NADF is used).

Various shaker screen mesh sizes can be used to remove a specific cuttings particle size, thereby optimising drilling fluid physical properties. Cuttings discharged are expected to range from very fine (~20 µm) to very coarse (<1 cm diameter) after removal from the drilling fluid.

Cuttings are expected to comprise predominantly claystone, marl, and calcareous formations from the upper sections of the well, and sandstone, siltstone, claystone, marl and coal from the lower sections of the well. An indicative cuttings volume of ~565 m^3 (Table 4-4) is expected to be generated per well (based on the indicative base-case well design (Table 4-3); but actual volumes depend on the final depth and drilling of the well (e.g. actual total depth, lost circulation, well washout, potential re-spud, etc.).

Throughout drilling operations several different fluids may be circulated into the well in a closed system including, but not limited to, WBF, NADF (if required), sea water, cement and kill-weight brine. During the displacement of one fluid to another, there is an interface mixture of both fluids. This interface mixture may be discharged depending on its content. If NADF use is required, the interface fluid will be isolated in a MODU tank and tested for composition (i.e. % NADF, % WBF, and % solids content). NADF interface fluids tested to contain <1% v/v NADF (synthetic base oil) content may be discharged to the ocean.

The NADF tanks on the MODU are cleaned when drilling operations are completed. Volumes of residual NADF (if used) are consolidated and recovered by mechanical means (e.g. squeegee, mud vacuum, etc.) before tank washing. NADF tank washing residue will be tested for composition. Residual tank cleaning fluids containing tested to <1% v/v NADF (synthetic base oil) content may be discharged to the ocean.

In the instance of lost circulation, it may be controlled with the use of fluid control materials such as bentonite, polymers, and/or other additives. In a severe case, it might be required to pull back and cement the area where the losses occurred, before drilling through the cement and recommencing.

Indicative volumes of WBFs and NADFs (if required) discharged to the ocean have been estimated based on historical data and G&E well design planning (Table 4-4).

4.2.3 Cementing operations

After drilling each of the top-hole sections, a casing is to be inserted and the annulus between the casing and the hole sealed with cement. For the conductor and surface casing, a cementing product is pumped until returns are observed at the seabed. When cementing top-hole sections (without a riser in place), the water-based spacer fluid is displaced by the cement slurry and discharged directly to the seabed at the mudline.

For the bottom-hole sections, 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. All bottom-hole cementing operations will be conducted with all returns to the MODU via a riser. Depending on volumes of cement and spacer fluid pumped, the spacer fluid will either remain downhole or be returned to the MODU and discharged to sea.

Cement slurry is pumped down the inside of the landing string and then 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 casing and liner cementations the cement will predominantly remain downhole, with minor excess cement returned to the MODU 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.

Wherever possible, the cement line flush volumes are included in the planned cement jobs. When a job is completed, the cement unit is cleaned, and the residual cement discharged overboard from the MODU. In the rare event that the cement products become contaminated, the entire volume may need to be discharged to sea.

Indicative volumes of discharges from cementing operations are provided in Table 4-4.

4.2.4 Pressure-control equipment installation and testing

After all top-hole batch drilling is completed, a BOP is installed and remains in use for bottom-hole drilling campaign (Figure 4-2). A BOP consists of a series of hydraulically operated valves and sealing mechanisms (annular preventers and ram preventers) that are normally open to allow the drill fluid to circulate up the marine riser to the MODU during drilling.

A BOP is to be used for the drilling campaign to provide an additional barrier to prevent a loss of well control (LOWC) event. The BOP is used to close the well in the event of an influx or kick, in which the hydrostatic pressure of the wellbore fluid is exceeded by the formation pressure. The MODU's high-pressure circulating system would be used in this event, after closing of the BOP, 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.

Once installed, regular function and pressure tests are undertaken; function tests will be undertaken weekly and pressure tests every three weeks (except in

exceptional circumstances). Function testing is undertaken by activating the hydraulic control system to pressurise and activate the rams within the BOP stack.

The BOP control system discharges water-based hydraulic control fluid into the ocean upon operation. A full BOP function or pressure test, which closes and opens all rams and annulars, may release up to ~4.5 m^3 of diluted control fluid over 30 minutes to hours into the ocean (Table 4-4). Surface BOP fluid discharges are also planned during the drilling campaign to enable function testing and pressure testing of the BOP prior to deployment, in line with industry standards (the expected volume of fluid discharged at surface or subsea is the same).

4.2.5 Formation evaluation

The wells may be evaluated using both 'logging while drilling' and 'electric-line' (e-line) methods.

Inflow tracers (e.g. polymer rods with gas soluble tracer) may be deployed within the single Eurytion (GE-1B) well to enable reservoir monitoring and management from this multizone well.

No vertical seismic profile is planned as part of the G&E drilling activity.

4.2.6 Well suspension

Well suspension involves setting a retrievable suspension plug within the well. The suspension plug provides a secondary barrier, which isolates the formation and ensures well integrity is maintained while the wells are temporarily suspended. Temporary suspension may occur between phases of the campaign prior to subsequent drilling or completion activities recommencing. No permanent suspension of the wells is planned within the EP.

For horizontal trees (see Section 4.2.7), following installation of the suspension plug, a wellhead/tree cap will be installed to provide mechanical protection to the wellhead and protect it from marine growth. Wellheads may also be protected using debris caps, which can be used to pump biocide or install biocide sticks. To inhibit marine growth or corrosion, a biocide and corrosion inhibitor are injected into or placed within the wellhead cap. The wellhead/tree cap can hold ~210 L (~0.21 m^3) of dilute corrosion inhibitor and biocide mixture. At this stage, there is no release to the environment; however, when the wellhead cap is removed, the fluid is discharged to the environment.

Indicative volumes of discharges from well suspension are provided in Table 4-4.

4.2.7 Horizontal subsea tree installation

The horizontal subsea tree (HXT) may be installed from either the MODU or a multi-purpose support vessel (MSV). Before installing the HXT, the well locations are surveyed using a ROV. The survey verifies that both the wellhead and work area are free from obstructions and that the HXT installation can begin.

Following the ROV survey, the wellhead cap is removed in preparation for running the HXT. At this stage, the previously injected biocide and corrosion inhibitor within the wellhead cap is exposed and released to the environment (see Section 4.2.6; Table 4-4).

If required, the wellhead is then cleaned (using either mechanical means [brush] or seawater jetting via a ROV) in preparation for installing the HXT. If brushing or jetting does not adequately clean any potential calcareous deposit from the wellhead, a cap with the capability for injecting/jetting a small volume of acid

(~0.02 m^3) may be used as a contingency to further clean the wellhead. Once this cap is removed, any remaining acid would be released to the environment.

Once the wellhead is prepared and made ready, the HXT is deployed from within a safe lift area (SLA). After the HXT is suspended within the SLA, it is lowered to a safe elevation above the seabed. From this position, it is then moved above the wellhead for installation.

When the HXT engages with the wellhead, the tree cap lock is pressurised, locking the tree in position on the wellhead. There may be a small discharge (~0.01 m^3) of control fluid; however, no further discharges are expected.

After installation, function testing is conducted to confirm the pressure integrity of the HXT to wellhead and to ensure valve functionality. An overpull test is undertaken to verify that the tree is secured in position. Small discharges of control fluids near-seabed (~0.03 m^3 per test) to the environment may occur during valve functionality testing. These tests typically occur during well completion, after the BOP and intervention workover control system are installed to the HXT.

4.2.8 Well completions

Once the HXT is installed, the reservoir section may be drilled and completions may be run and landed in the tree, which is provided with an internal profile, landing shoulder, and orientation helix guide for the tubing hanger.

The previously installed retrievable suspension plug is removed from the wellbore, and the fluid within the wellbore is replaced with filtered brine. The displaced fluid is collected on board the MODU and filtered via a diatomaceous earth (DE) filtration system. Spent DE filtration medium will be discharged overboard at the well location. It is anticipated that the completions phase for each well is likely to produce ~2 tonne of used DE product. After completion activities, any remaining filtered brine may be discharged overboard, with volumes from a single wellbore of ~400 m^3.

After the wellbore has been displaced to brine the wells are then displaced with the water-based reservoir drill-in fluid (WBRDIF) and the 8½" hole section may be drilled through the HXT (if not already previously drilled). In addition, OHGP will be installed to keep the produced fluid clear of sand (if not already performed during the drilling phase). On completion of the OHGP, a filter cake breaker will be displaced across the open hole completion and a fluid loss valve will be closed, isolating the open hole from the upper completion. The upper completion wellbore will be displaced to inhibited completion fluid.

A string of completion tubing, complete with production packer and a surface control subsurface safety valve (SCSSV), is then installed.

Once the well is successfully completed, it is suspended by releasing the landing string and displacing the riser. Small discharges of control fluids near-seabed (~0.03 m^3) to the environment may occur.

4.2.9 Well clean-up

Well and casing clean-up is required at various stages of the drilling activity to ensure the contents of the well are free of contaminants before the next stage of drilling. A clean-up pill train (cleaning agent) and other chemicals may be used to remove residual fluids (including NADF if used) from the wellbore.

During the clean-up process, fluids are circulated back to the MODU, and, if required, analysed before they are discharged overboard. Any displaced fluid that has the potential to contain NADF is analysed for residual hydrocarbons before discharge overboard.

Note: Well clean-up will be directed to the Gorgon GTP on Barrow Island once the wells are handed over to operations and Ready for Start-up (RFSU) commissioning milestone has been reached. These activities are outside of the scope of this EP.

4.2.10 Well flowback

No well flowback and testing is planned for the G&E wells.

4.2.11 Contingency activities

In the event of technical or operational issues during the drilling activity, contingency activities may be required. The activities are not expected to cause additional risks or impacts but may generate additional discharges (e.g. drilling fluids, cuttings, cement), emissions or seabed disturbance.

Indicative volumes of discharges and emissions from contingency activities are provided in Table 4-4.

4.2.11.1 Well abandonment

Permanent well abandonment is not planned during the in-force period of this EP (Section 2.3.2); however, an unplanned abandonment may occur in scenarios such as:

- a catastrophic gravel pack failure (sidetrack or abandonment decision being based on Estimated Ultimate Recovery)
- abandoning a wellhead in the event of well replacement.

Plug and abandonment procedures permanently isolate the well and mitigate the risk of a potential release of wellbore fluids. A combination of mechanical plugs and cement plugs will be installed to serve as permanent barrier elements in accordance with the *ABU, BU Standard Operating Procedures (SOP) Well Barriers* (Ref. 19). This standard ensures consistent abandonment designs to:

- isolate hydrocarbon, hot water, or steam zones
- protect freshwater aquifers (potable groundwater)
- protect surface soil or sea from contamination by migration of formation fluid to surface.

Well abandonment activities will be conducted in accordance with an approved program, which will contain well barrier plans and schematics, as well as barrier verification methods prior to and during well abandonment.

Install BOP and well kill

Before commencing well abandonment operations the well will be suspended through the subsea tree by means of tubing intervention operations. After the BOP is installed, it will be pressure tested prior to the landing string being installed. The primary well kill method is bullheading down the landing string into the production tubing bore after the internal tree cap has been removed.

Cut / perforate casing / production tubing

Production tubing and/or well casing may either be cut or perforated using a number of methods (e.g. perforation charges, mechanical or chemical cutting techniques). If production tubing exists, the annulus content (inhibited water or brine) will be displaced to surface in a controlled manner and replaced with kill-weight brine. All returns at surface will be discharged overboard and may comprise small component of hydrocarbon. These discharges are expected to be no different to those discharges described in Sections 4.2.7 and 4.2.9. Any residual gas will be returned to the MODU and vented. These releases are expected to be no different to those described in Sections 4.2.11.4 and 4.2.11.5.

Install permanent barriers

Once the reservoir abandonment plug is set and tested, the wellbore contents above the reservoir barrier will be displaced and circulated to inhibited WBF of appropriate density. Wellbore content (weighted fluid and cement contaminated mud, water, barite, cement, and polymers) may be discharged from the surface. A series of plugs will be set (and tested) at intervals above the reservoir barrier in accordance with the WOMP (Ref. 6; Ref. 7; Ref. 8) and the well content above the plugs will be discharged as outlined above. The discharges are expected to be no different from those described in cementing operations (Section 4.2.3).

Remove BOP stack

Once the final permanent plug has been set and tested, the BOP stack can be detached from the wellhead and recovered back to the MODU. Before disconnecting the BOP stack from the wellhead, the system will be flushed with sea water. A small discharge of cement-contaminated sea water may occur upon completing this activity (Table 4-4).

Sever and remove surface casing and wellhead

A wellhead cutting tool is then landed onto the wellhead to sever the casing just below or at the seabed. Cutting wellheads is anticipated to take ~12 hours per well. Cutting will generate discharges at the seabed (Table 4-4). The wellhead is then pulled free and recovered to the MODU through the moonpool.

Post-operation ROV survey

Once the wellhead is removed, an ROV is deployed from the MODU to conduct a post-operation survey. This survey records the condition of the seabed at the completion of the program, to ensure that no dropped objects or subsea equipment intended for removal remain on the seabed. This survey typically involves a ~50 m radius visual check from the wellhead.

4.2.11.2 Well re-spud

If technical or operational issues are encountered while drilling, such as a failure to meet installation criteria, a well re-spud may be required. This activity could involve kedging the MODU within the immediate area of the well and to recommence drilling. A well re-spud would result in an increase in the volume of cuttings and cement generated.

4.2.11.3 Sidetrack

A sidetrack is an alternative to a well re-spud, which involves drilling a secondary wellbore away from the primary wellbore. This may be done to avoid an unusable section of the primary wellbore, or if it is otherwise inaccessible. A sidetrack would

be expected to result in an increase of cuttings generated and potentially cement discharges (Table 4-4).

4.2.11.4 Flaring and cold venting

Flaring and/or cold venting is not planned but may be required during the drilling and completion activities. For the G&E drilling campaign, flaring infrastructure is not intended to be installed on the MODU; if reservoir gas needs to be released this will be done via cold venting.

Cold venting involves the controlled release of gas to the atmosphere without combustion. Under the cold venting operation, dispersion can be managed by limiting the released rate. An allowance for cold venting (per production well) has been based on the typical volume of the wellbore and landing string (Table 4-4).

4.2.11.5 Well suspension

Well suspension (including de-suspension) may be required as a contingency activity due to unplanned events (e.g. extreme weather). Well suspension involves installing suitable barriers, removing the riser and disconnecting the MODU from the well. Well suspension activities would be undertaken in accordance with the WOMP (Ref. 6; Ref. 7; Ref. 8).

Small volumes (Table 4-4) of reservoir gas may need to be handled back to the MODU. These volumes would be cold vented from the MODU to the atmosphere.

The process of a planned disconnection of the riser would result in the riser being displaced with sea-water before disconnection and therefore no planned discharge of drilling fluids and cuttings.

4.2.11.6 Emergency disconnect sequence

If the MODU is required to rapidly disengage from the well, an emergency disconnect sequence may be required. The sequence consists of closing the BOP and disconnecting the riser. The process of disconnecting the riser would result in a discharge of drilling fluids and cuttings (Table 4-4).

4.2.11.7 Cementing operations

Additional cementing operations may be required as a contingency activity due to unplanned events (e.g. kick-off plugs, failed formation integrity test, lost circulation remediation). The discharges are expected to be no different from those described in cementing operations (Section 4.2.3).

4.2.12 Summary of emissions and discharges

Table 4-4 summarises the discharges and emissions associated with G&E drilling campaign.

Table 4-4: Summary of planned and contingent discharges and emissions per well

Discharge type	Indicative volume (m^3) per well (unless otherwise indicated)	Indicative discharge location
Drilling fluids and cuttings		
WBFs	1,500	Seabed
	2,550	Surface^

Discharge type	Indicative volume (m^3) per well (unless otherwise indicated)	Indicative discharge location
Wellbore clean-up fluid discharge (NADF/WBF interface) (riser in place)*	100	Surface
Cuttings (riserless)	260	Seabed
Cuttings (riser in place)	285	Surface
Cementing operations		
Cement slurry (riserless / riser in place)	115 / 20	Seabed/Surface
Spacer fluids (riserless / riser in place)	30 / 60	Seabed/Surface
Residual cement (line flushing)	100	Surface
Blowout preventer testing		
Control fluid (function or pressure test)	4.5 per test	Seabed/Surface
Well suspension		
Suspension fluids (riser in place)	500	Surface
Subsea tree installation		
Wellhead cap removal – diluted corrosion inhibitor and biocide+	0.21	Seabed
Control fluids (connection of wellhead to HXT)	0.01	Seabed
Control fluids (valve functioning test)	0.03 per test	Near-seabed
Well completions		
Completion fluids (riser in place)	1,565	Surface
Brine	400	Surface
MEG	100	Seabed
Control fluids	0.03	Near-seabed
Contingency IMR		
Well interventions – marine growth removal fluids	0.01–0.1	Seabed
Well interventions – MEG	1	Seabed
Well interventions – Completion fluids	1	Surface
Well interventions – Control fluids	0.01	Seabed
Well workover – Brine	220	Surface
Contingency activities		
Drilling fluids – NADFs (riser in place)*	155	Surface
NADF residual tank washing*	100	Surface
Subsea tree installation – marine growth removal fluids	0.01	Seabed
Wellbore content – well abandonment	<130	Surface^
Contaminated cement – well abandonment	100	Surface
Metal swarf, cement cuttings, grit, flocculant – well abandonment	<0.1	Seabed
Cements – well re spud (riserless/riser in place)	115 / 20	Seabed/Surface
Cuttings – well re-spud (riserless/riser in place)	260 / 305	Seabed/Surface

Discharge type	Indicative volume (m^3) per well (unless otherwise indicated)	Indicative discharge location
Cuttings – sidetrack (riser in place)	300	Surface
Cuttings – emergency disconnect (riser in place)	20	Seabed
WBF or NADF drill fluids – emergency disconnect (riser in place)*	229	Seabed
Failed cement job / cement contamination (riser in place)	70	Surface
Cementing operations (riser in place)	60	Surface
Excess bulk - cement	25	Seabed
Excess bulk - barite	50	Seabed
Emission type	**Indicative volume (MMscf) per well (unless otherwise indicated)**	**Emission location**
Contingency activities		
Cold venting of reservoir gas during drilling and completion activities	1.5	Atmosphere
Cold venting of reservoir gas during well abandonment or well suspension	1.5	Atmosphere
Well intervention – nitrogen	5,000 m^3	Atmosphere
Well intervention – cold venting reservoir gas	1.5	Atmosphere
Well intervention – flaring reservoir gas	60	Atmosphere

^ *"Surface" fluids are discharged from the MODU below water level*

* *Indicative volume if NADF is used as contingency*

+ *Volumes identified here represent the diluted discharges of the volumes described in Section 4.2.6.*

4.3 Inspection, maintenance, and repair

Section 572(2) of the OPGGS Act requires a titleholder to maintain in good condition and repair all structures, equipment, and other property (hereafter collectively referred to as 'property') that is within the title area and is used in connection with the operations authorised by the title.

IMR activities (including inspections) are contingent activities that are not planned to occur as part of the petroleum activity; however, they have been provided for in this EP in the unlikely event that they are required.

IMR of subsea infrastructure may be undertaken to ensure that the asset integrity is being maintained to acceptable standards while this EP is in-force. IMR activities may occur at any time once the infrastructure is installed, and before commissioning and start-up.

4.3.1 Inspection

Inspections provide assurance that asset integrity is being maintained and assets are being operated according to design. They also proactively identify maintenance or repair activities that may be required. Inspection generally involves the use of an IMR vessel with an ROV/AUV.

Inspections are undertaken with a frequency determined using a risk-based approach. Events such as cyclones or seismic activity that could affect the subsea infrastructure may also trigger inspections. Inspection techniques may include (but are not limited to):

- visual inspections
- marine acoustic surveys (e.g. use of side scan sonar [SSS] or multibeam echo sounder [MBES] and sub-bottom profiler [SBP] techniques)
- cathodic protection measurements (e.g. completed using a ROV/AUV and conductivity probes or by making visual assessments of anode wastage).

4.3.2 Maintenance and repair

Maintenance and repair activities, including equipment change-out, are conducted during:

- prevent deterioration and/or failure of infrastructure
- maintain reliability and performance of infrastructure
- ensure infrastructure is adequately maintained to enable the potential for future removal.

The frequency of maintenance and repair activities will be dependent on the results of inspections.

4.3.2.1 Well intervention

Well intervention may be required for various reasons, including but not limited to well equipment failure repairs, critical well component replacement/repair, formation impairment repairs, data acquisition, or well suspension.

Well intervention generally occurs within the wellbore and may include the following activities, as well as any other drilling activities described in Section 4.2:

- subsea tree replacement
- well logging activities (slickline, wireline, coil tubing)
- well workovers.

During intervention activities, local control of the HXT may be required. Valve actuation of the trees may also be required, which will result in small volumes of control fluids to be released to the subsea environment (as described in Section 4.2.7).

Intervention activities may also include removing any marine fouling by mechanical or acid soaking, resulting in the release of marine-fouling debris and small amounts of acid to the environment (~0.01–0.1 m^3). When intervening, pressures may be equalised or wellbore fluids displaced back into the well using nitrogen gas. The nitrogen will then be vented to the atmosphere (Table 4-4). Alternatively base oil may be used; however, this fluid will not be discharged.

Well intervention activities, such as well de-suspension (pulling plugs), may also require small releases of MEG to the environment when inserting/removing tooling, and/or when recovering subsea equipment to surface between manifolds and/or at the end of an intervention campaign. The MEG may also contain conditioning chemicals. Indicative volumes of MEG expected to be released are provided in Table 4-4.

Completion fluids (brine and any produced water or condensate) present in the wellbore will be circulated back to the MODU for flaring and subsequent discharge overboard. The volumes of produced water are expected to be minimal due to the low formation water content associated with the reservoir gas when pressure is reduced. Prior to discharge to the marine environment, fluids will be analysed to confirm residual oil-in-water concentration is <30 ppm. Fluids not meeting this standard may be retained for onshore disposal. Indicative volumes of these discharges expected to be released are provided in Table 4-4.

Additionally, during de-suspension operations there may be small volumes of reservoir gas that are required to be cold vented via the vent lines on the MODU or light well intervention (LWI) vessel. The volume of gas flushed to the surface will be small due to the volume between barriers. the indicative volume of gas vented (at atmospheric pressure) is provided in Table 4-4.

Note: Pressure-control equipment other than a BOP may be used for well intervention works; however, the activities are not considered to be any different to those described in Section 4.2.4. During well intervention function testing, a small volume release of subsea hydraulic fluid would be expected via actuation of valves on the subsea tree.

The well intervention strategy assumes that subsea tree repairs/replacements may be conducted using a MSV, and well interventions may be conducted using a MODU or LWI vessel.

4.3.2.1.1 Subsea tree replacement

G&E wells have been designed with HXTs. Therefore, suitable in-well barriers must be installed, and the upper completion retrieved, before the HXTs can be removed and replaced.

4.3.2.1.2 Well logging

In well logging operations, a wire (slickline), braided cable (wireline), or a long metal pipe (coil tubing) is lowered into the well to run tools in and out of the wellbore. Before conducting these operations and entering the wellbore, pressure control equipment is calibrated and pressure is tested to ensure that control of the well is maintained once it is opened. The well may also be controlled by using overbalanced drilling fluids if required. Although equipment may be located outside the well (potentially resulting in fugitive fluid releases associated with greasing the slickline and wireline), all slickline, wireline, and coil-tubing operations occur within the contained environment of the wellbore.

The tasks associated with these activities include (but are not limited to):

- setting and retrieving mechanical isolation barriers
- reservoir surveillance via logging
- venting
- perforating casings
- determining depth
- detaching production packers and anchoring mechanisms (to enable upper completions to be pulled)
- repairing well components

- reinstating wells.

During well reinstatement, all well intervention barriers (such as pressure-control equipment or isolation plugs) are removed.

4.3.2.1.3 Well workover

Well workovers are required to replace major well components or components otherwise inaccessible in the well. A workover may be required for:

- SCSSV, tubing, production packer, or tubing hanger replacement
- repair of control or chemical injection lines
- wellhead repair
- casing and/or liner repair
- lower completion workover (including sidetrack of OHGP section).

The activities associated with well workovers may include (but are not limited to):

- removing production tubing (and associated equipment)
- wellbore clean-up
- replacing tubing (and associated equipment)
- cold venting or flaring
- pumping fluids down the wellbore
- well reinstatement.

Workover operations may be preceded by through tubing intervention, setting a barrier (plug) in conjunction with MODU BOP to recover the tubing, followed by setting two barriers (plugs) to suspend the well before recovering the subsea tree.

The MODU BOP with either a simplified landing string or tubing hanger recovery tool is used in the completion recovery.

The current version of the *ABU, BU Standard Operating Procedures (SOP) Well Barriers* (Ref. 19), shall be adhered to during any well workover planning and execution activities. This standard contains Chevron Corporation's minimum requirements for preventing and/or mitigating formation fluid crossflow and/or release of fluids to the environment.

When pulling tubing, the production packers are first detached, the tubing is pulled, and then the well is cleaned using a brine that may include several chemicals (e.g. biocide, surfactant). Once clean, the tubing is installed and various completion equipment (such as downhole gauges, a tubing-retrievable safety valve, production packer to anchor the tubing) will be run with the production tubing string.

The contents of the wellbore (brine) may be discharged at the surface (Table 4-4).

Additionally, during well workover operations reservoir gas may need to be flared via the flare lines on the MODU. The indicative volume of gas flared (when flared at atmospheric pressure) is provided in Table 4-4. Flare drop-out and an unplanned release of condensate is not expected to occur from flaring of gas due to reservoir fluid composition (relatively low liquid to gas ratio).

4.4 Support activities

4.4.1 Mobile offshore drilling unit

A drillship or semi-submersible MODU (hereafter collectively referred to as 'MODU') may be used for the G&E drilling campaign. The MODU will maintain position using a dynamic positioning (DP) system.

Due to their size and type of activity, MODU's have constrained manoeuvrability. A 500 m SNA will be requested around the MODU for the duration of activities, mainly due to operational and safety considerations.

4.4.1.1 Acoustic positioning equipment

An array of long baseline (LBL) and/or ultra-short baseline (USBL) transponders may be used to accurately position the MODU (or other vessels during well interventions) and/or deployed equipment (e.g. ROVs).

Transponders are lowered to the seabed (with a clump weight if required). Acoustic transmissions are not continuous but consist of short 'chirps' when active and do not emit any sound when on standby. If utilised, the transponders will be on the seabed for the duration of the drilling and well intervention activities. Both the transponder and clump weight (if used) are retrieved to the surface by a ROV following use.

Note: Transponder frames within the vicinity of the G&E DC to support subsequent GS3 campaigns may also be installed.

4.4.1.2 Operations

The MODU is fitted with various general operations equipment to support offshore activities including:

- power generation systems
- fuel storage
- cooling water and freshwater systems
- drainage, effluent, and waste systems.

Non-drilling activities occurring on the MODU include:

- bunkering or bulk transfer of fuel, chemicals, and supplies
- transfer of waste to vessels
- discharge of:
  - sewage, greywater, food waste
  - cooling water, reverse osmosis brine
  - deck drainage and bilge.
- use of helipad (see also Section 4.4.3 for helicopter operations).

A contract with a MODU is in place for this G&E drilling activity. It is expected the MODU will operate with up to 220 persons on board (POB).

Estimates of sewage and grey water volumes are ~0.04–0.45 m^3 per person per day, and estimates of putrescible food waste are in the order of ~1–2 kg per person per day (Ref. 21). Based on an indicative 220 POB, this gives an

estimated discharge of sewage and greywater of up to ~99 m^3/day and ~440 kg/day for food waste from the MODU.

Several different materials will be transferred from support vessels to the MODU for the G&E drilling activity. For example, cement, barite, and bentonite are transported as dry bulk, and are pneumatically blown from the support vessels to the MODU storage tanks using compressed air. The MODU dry bulk storage tanks vent excess compressed air to atmosphere and this venting process also discharges small amounts of solids. Based upon previous programs, it is estimated that during each bulk transfer, a dry bulk loss in the order of ~0.005% is expected. Based on an estimated storage capacity for bulk cement, barite, and bentonite on the MODU, this equates to <0.2 m^3 of solids discharged for the entire program. If there is an excess of dry bulk consumables, it will be managed according to the unused bulk product process (Section 10.3.3.3).

4.4.2 Vessel operations

Vessels of different sizes and capabilities (e.g. cranes, bunkering equipment, intervention equipment, installation of frames, etc.) will be required to support or undertake activities within scope of this EP. The indicative types of vessels that may be used include: LWI vessels, platform supply vessels (PSVs), MSVs, and IMR vessels.

During the drilling campaign, up to two vessels (in addition to the MODU) may be within the OA at any time, noting that vessel presence varies and that the presence of one vessel (in addition to the MODU) within the OA is more common for the activities within scope of this EP.

General support functions for the vessels during the drilling campaign include:

- supply and transfer of goods and materials (e.g. food, fuel, bulk products, drilling fluids, etc.) to or from the MODU
- transfer of waste or other material from the MODU.

Vessels only enter the 500 m SNA around the MODU under specific instruction from the MODU, such as for supporting specific activities, or when transferring goods and materials to the MODU. The PSVs typically use DP to maintain position when stationary and undertaking works; however, will typically idle or slow-transit when on standby.

Vessel anchoring within the OA shall not be permitted except during emergencies (if required).

Vessels will not use Heavy fuel oil but will utilise a lighter marine fuel such as marine diesel oil (MDO) or marine gas oil. Vessels will typically return to port to bunker; however, bunkering (refuelling at sea) may be undertaken for larger vessels (e.g. LWI vessels).

Vessels routinely discharge a variety of wastewater streams to the marine environment including sewage, greywater, food waste, cooling water, brine, and oily bilge water; vessels may also incinerate solid wastes.

In the event of unsafe environmental conditions (e.g. a cyclone passing over or close to the OA), the vessels may transit away from the OA to a safer location. As per Section 2.3.2, once a vessel leaves the OA, it is no longer undertaking a petroleum activity.

4.4.3 Helicopter operations

The MODU is serviced by helicopters, with an expected routine flight frequency of ~5 flights per week, with additional flights as required to meet operational demands or contingency activities. Helicopter flights will primarily be used for passenger transfers, crew changes or minor supplies. Helicopters will be refuelled onshore.

4.4.4 ROV and AUV operations

Underwater ROVs or AUVs may be deployed and controlled from either the MODU or vessels to support or undertake:

- pre- or post-activity site surveys
- equipment deployment, monitoring, or retrieval
- subsea tree control systems hook-up and contingency control
- tool deployment and operation.

ROV/AUVs are generally equipped with a video camera and lighting. ROVs are also used to deploy specialist tooling and equipment. ROVs are closed systems, such that hydraulic fluids are circulated to move components, but these are not released to the environment.

AUVs are untethered underwater vehicles. They are typically battery-powered and do not store any chemicals or fuel onboard.

ROV/AUVs will typically be stored on the deck of the vessels and/or MODU, but may be wet parked between activities, resulting in a temporary disturbance to a small area of the seabed.

4.4.5 Simultaneous operations

Based on the indicative schedule for GS3 drilling campaign (Section 4.1.2), CAPL may also be undertaking other vessel-based petroleum activities (e.g. J-IC Project and/or other GS3 activities) at the same time. Any simultaneous operations (SIMOPS) will be managed in accordance with CAPL procedures.

Further information on petroleum activities within the vicinity of the OA is provided in Section 5.4.6.

Any potential cumulative environmental impacts and risks from concurrent petroleum activities are described and evaluated within Section 8 this EP.

4.5 Decommissioning planning

CAPL's approach to decommissioning planning is described in Section 4.3.5 of the Gorgon Backfill Fields Development OPP (Ref. 3). In accordance with regulation 56 of the OPGGS(E)R, as this information has been previously supplied for another purpose, and is publicly available[7], it has not been repeated within this EP.

Consistent with information presented in the OPP, the key focus during this phase of project development is that the design of property considers decommissioning.

[7] The NOPSEMA-accepted Gorgon Backfill Fields Development OPP is available online at: https://docs.nopsema.gov.au/A1265361. Section 4.3.5 of the OPP describes CAPL's approach to proactive decommissioning planning for the Backfill Fields Development.

All subsea property (above the mudline) associated with GS3 is designed to be removable when no longer in use in connection with operations.

Table 4-5 outlines the decommissioning considerations for key property items to be installed under this EP. These considerations include indicative infrastructure specifications (e.g. composition, dimensions, weight). Following installation, GS3 property will be incorporated into CAPL's inventory of subsea assets. The subsea inventory includes property that is "operational" as well as "non-operated assets" that are not associated with any of its current operations. Subsea assets classified as abandoned (with relevant supporting regulator documentation) are not included within the subsea inventory.

Section 572(2) of the OPGGS Act requires a titleholder to maintain in good condition and repair all property that is within the title area and is used in connection with the operations authorised by the title. The intent of section 572(2) relates to ensuring that property is fit for purpose and is able to be removed when neither used, nor to be used, in connection with the operations. IMR is included in this EP for the period of time between installation and prior to commissioning and start-up (Section 4.3).

Section 572(3) of the OPGGS Act also requires a titleholder to remove all property that is within the title area and is neither used nor to be used in connection with the operations authorised by the title. Within the in-force period of this EP, there is no plan to cease using any property, and thereby require removal under section 527(3).

Table 4-5: Overview of the primary composition of key infrastructure

Infrastructure	Infrastructure description	Primary composition of materials
Wellheads	6 x wellhead systems 36" Wellhead (~30% above) 18 ¾" Wellhead (~30% above) 13 5/8" landed in wellhead (all above) Seal (all above) Spacer (all above).	The wellheads are primarily constructed of carbon steel and low alloy forging steel. Both types of steel are mainly comprised of iron (~97–98%) with small amounts of other alloying elements. The carbon steel components include conductor joints and corrosion/debris caps. The low alloy forging steel components include the high pressure and low-pressure housings, casing hangers, seal assemblies and spacer sleeves
Subsea trees	6 x 7" HXT Systems	The HXT systems are primarily constructed from a variety of structural steel elements, including carbon steel, low alloy forging steel, stainless steel, super duplex stainless steel, and nickel alloys. Theses steels are mainly comprised of iron (~97–98%) with small amounts of other alloying elements. The carbon steel components include the tree structural support frame, top plate, guide funnel, landing supports and tree caps. The additional steel type components include the tree valve body, wing blocks, valve actuators, controls components, tubing hangers, multi-phase flow meter, high pressure and low-pressure housings, casing hangers, seal assemblies and spacer sleeves. A variety of coatings may be used on the subsea tree system to provide corrosion protection, including epoxy, polyurethane, and silicone coatings

5 Description of the environment

5.1 Environment that may be affected

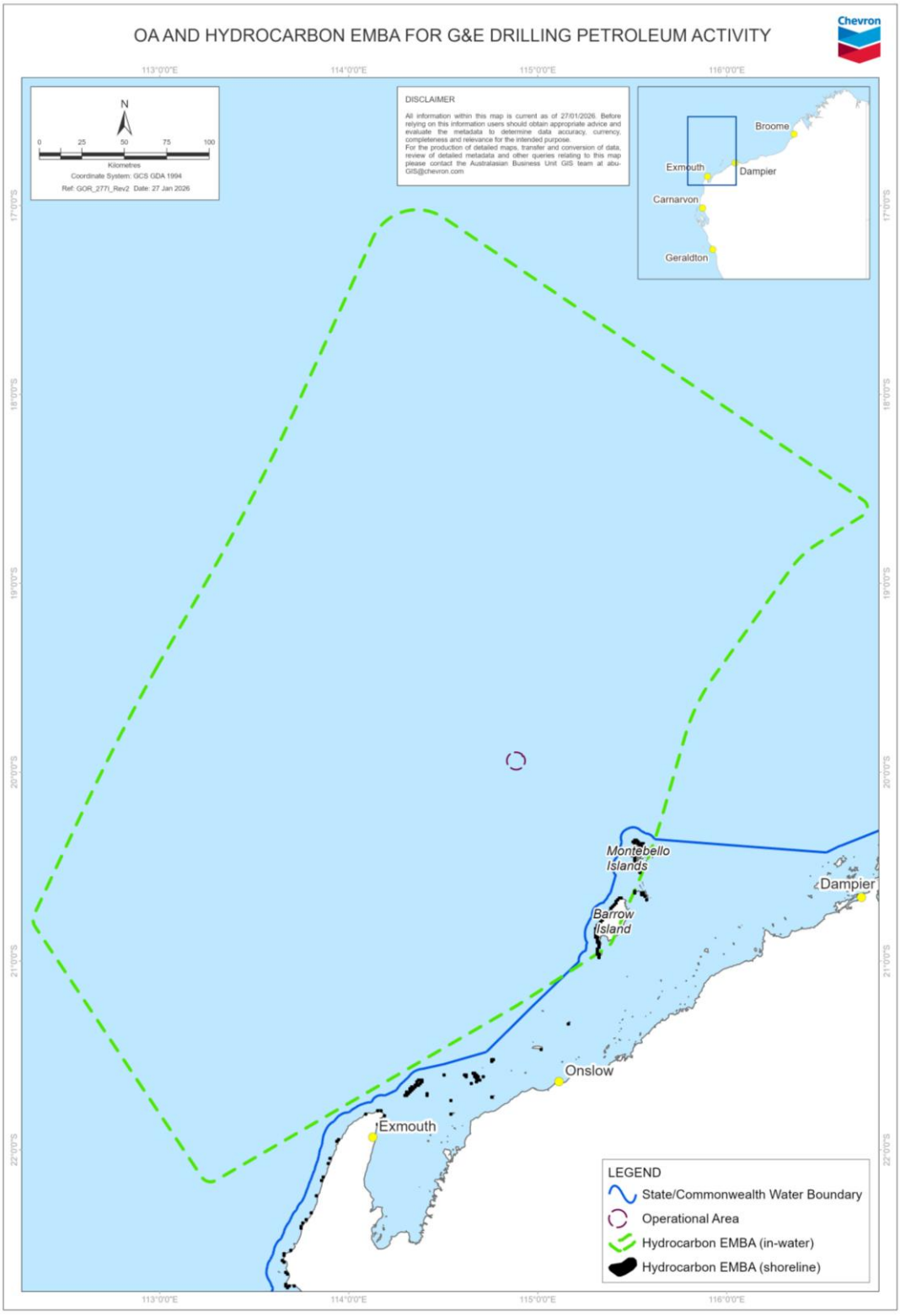
This section provides a description of the environment that may be affected (EMBA) by the petroleum activity as required by regulation 21(2) of the OPGGS(E)R.

The purpose of this requirement is to provide adequate information about the EMBA by the petroleum activity to inform the evaluation of environmental impacts and risks (Ref. 22). As such, this includes the EMBA by both planned activities and unplanned events associated with the petroleum activity (Ref. 22). However, the level of detail provided should be commensurate to the nature and scale of the impacts and risks (e.g. the EMBA by planned activities may be described in greater detail compared to the EMBA in the unlikely event of a worst-case hydrocarbon release) (Ref. 22).

For the purposes of this EP, CAPL has presented the description of the EMBA in two categories:

- OA—the area where the petroleum activity will be undertaken (Section 4.1.1)
- Hydrocarbon EMBA—a broader area based on stochastic modelling results for the worst-case credible unplanned hydrocarbon releases (Section 8.15 and 8.16).

Note: The exposure values adopted to define the Hydrocarbon EMBA are consistent with the exposure values recommended within NOPSEMA's *Information paper: Application of oil spill modelling in Environment Plans* (Ref. 23). See Section 8.15 and Table 8-69 for further information.



Note: The Hydrocarbon EMBA is shown as separate in-water (surface, entrained, dissolved) and shoreline components. Shorelines are only part of a Hydrocarbon EMBA where stochastic spill modelling predicts that shoreline loading above the relevant exposure values occur.

Figure 5-1. OA and Hydrocarbon EMBA

5.2 Matters of national environmental significance

Matters of national environmental significance (MNES) are protected under the EPBC Act. The potential presence of MNES within the OA and Hydrocarbon EMBA has been determined based on information from the Australian Government's online Protected Matters Search Tool (PMST) (Ref. 24) and is summarised in Table 5-1. The full PMST reports are included in Appendix D.

Note: The EPBC Act PMST is a general database that conservatively identifies areas in which protected species have the potential to occur. Where these species and/or features are not expected to credibly occur within the OA or Hydrocarbon EMBA (e.g. terrestrial species), these do not form part of the following description of the environment.

Table 5-1: Presence of MNES within the OA and Hydrocarbon EMBA

MNES	OA	Hydrocarbon EMBA
World Heritage properties^	×	✓
National Heritage places^	×	✓
Wetlands of international importance (Ramsar wetlands)^	×	×
Nationally listed threatened species and communities^	✓ species ×communities	✓ species ×communities
Nationally listed migratory species^	✓	✓
Commonwealth marine area^	✓	✓
Great Barrier Reef Marine Park	×	×
Nuclear actions (including uranium mining)	—	—
Water resources (in relation to coal seam gas or large coal mining development)	—	—

^ These MNES are also identified as relevant values and sensitivities under the OPGGS(E)R.
Where ✓ = present, × = not present, and — = not relevant to the petroleum activity.

5.3 Ecosystems and their constituents parts, including people and communities

5.3.1 Benthic communities and habitats

Benthic communities are biological communities that inhabit the seabed and are important for primary or secondary production. Benthic habitats are areas of seabed that do, or can, support these communities. Benthic communities play an important role in maintaining the integrity of marine ecosystems and the supply of ecological services. There is strong evidence that benthic communities are also important for the maintenance of biological diversity as they provide structurally complex and diverse habitat, refuge for vulnerable life stages and a varied and increased food supply (Ref. 25).

The OA and Hydrocarbon EMBA occur within the North-west Marine Region (NWMR), which is typically characterised by shallow-water tropical marine ecosystems and high species richness (Ref. 26; Ref. 27). The high species richness is thought to be associated with the diversity of habitats available across the NWMR, such as limestone pavement, coral reefs, and pinnacles (Ref. 26). The broad benthic communities and habitats (BCH) that may be present within the OA and Hydrocarbon EMBA are summarised below, with additional data specific to the OA summarised in Section 5.3.1.1.

The geomorphology of Australia's continental margin is varied. Based on Geoscience Australia's geomorphic classification of seabed within Australia's exclusive economic zone (EEZ) (Ref. 28), the geomorphic features present within the OA and Hydrocarbon EMBA are shown in Table 5-2. One of the pinnacle features identified within this dataset is Rankin Bank, a known bathymetric feature of regional significance, which occurs within the Hydrocarbon EMBA (see Section 5.3.1.2).

Table 5-2: Geomorphic features

Feature	OA	Hydrocarbon EMBA
Canyon	×	✓
Deep / hole / valley	✓	✓
Plateau	×	✓
Pinnacle	×	✓
Reef	×	✓
Shelf	×	✓
Slope	×	✓
Terrace	×	✓
Trench/trough	×	✓

The composition, distribution, and movement of marine sediments is an important component of a marine ecosystem. These sediments can influence the primary biological production in the water column as well as the evolution and distribution of benthic habitats. The north-west region of WA comprises bio-clastic, calcareous, and organogenic sediments deposited from relatively slow and uniform sedimentation rates (Ref. 29). Sediments in the NWMR generally become finer with increasing water depth, ranging from sand and gravels on the continental shelf to mud on the continental slope and abyssal plain (Ref. 30).

Based on CSIRO's marine benthic substrate database (Ref. 34), the predominant seafloor sediment type within the OA is "calcareous gravel, sand and silt". Within the Hydrocarbon EMBA four seafloor sediment types were identified: "calcareous gravel, sand and silt", "calcareous ooze", "mud and calcareous clay", and "biosiliceous marl and calcareous clay".

A previous benthic survey on the North West Shelf (NWS) in water depths >900 m, identified crustaceans and polychaete worms as the dominant taxonomic groups of infauna (Ref. 31). The study (Ref. 31) concluded that infauna associated with soft unconsolidated sediments within the general survey area are widespread and well represented throughout the NWS region.

This survey is consistent with benthic surveys conducted at the Jansz–Io field and along the Jansz Feed Gas Pipeline route, ~15–35 km west of the OA, in waters depths ranging from ~210 –1,360 m (Ref. 35; Ref. 36). Like other deepwater habitats on the NWS, benthic fauna was depauperate, with low abundance, richness, and diversity (Ref. 35). Species richness, diversity and abundance decreased with depth (Ref. 36). Standardised comparisons showed that overall diversity, abundance, and species richness were typically greater at sites on the surveyed infrastructure (Ref. 36).

In offshore, deeper regions, epifauna (benthic organisms on the seabed) are typically sparse and patchy in distribution, often associated with areas of hard

substrate. The presence of epifauna is closely linked to substrate type, with hard substrates generally supporting more diverse benthic communities (Ref. 32). Offshore seabed surveys across the NWMR have observed a general reduction in epibenthic coverage with increasing depth (Ref. 27; Ref. 30). The benthic survey for deepwater (>900 m) habitats on the NWS identified the dominant types of epifauna as arthropods and echinoderms (Ref. 31).

The Integrated Marine and Coastal Regionalisation of Australia (IMCRA) is a biogeographic regionalisation of oceanic waters within Australia's EEZ (Ref. 37). The OA occurs within the Northwest Province provincial bioregion[8]. The Hydrocarbon EMBA intersects with five provinces (Table 5-3). The geomorphology characteristics and biological communities for each of these bioregions, as described in *The North-west Marine Bioregional Plan: Bioregional Profile* (Ref. 27) are summarised in Table 5-3.

Listed threatened ecological communities (TECs) are a MNES under the EPBC Act, and a relevant value and sensitivity under the OPGGS(E)R. There are no known TECs within the OA or Hydrocarbon EMBA.

Table 5-3: Features of provincial bioregions

IMCRA Provincial Bioregion^	OA	Hydrocarbon EMBA
Central Western Shelf Transition	✖	✓
Characteristics of the geomorphology and biological communities of the Central Western Shelf Transition include: • bioregion is located entirely on the continental shelf and is comprised mainly of sandy sediments • this bioregion includes both State and Commonwealth waters between water depths of 0 m to ~80 m – Commonwealth waters in this bioregion represent <1% of the total area of the NWMR • the benthic ecological communities of the bioregion, include both tropical and temperate species transitioning along a north-south gradient • Ningaloo Reef[9] is the most significant geomorphic feature of this bioregion: – it extends along the Cape Range Peninsula for over 260 km, and is the only example in the world of an extensive fringing coral reef on the west coast of a continent – it is marked by a well-developed spur and groove system of fingers of coral formations penetrating into the ocean with coral sand channels in between – a lagoon on the inshore side separates Ningaloo reef from the mainland – the biological communities of the Ningaloo Reef differ from the hard coral reefs located elsewhere in the NWMR • a large proportion of this bioregion is covered by the State and Commonwealth Ningaloo Marine Parks, which are one of the most significant hotspots of biodiversity within the NWMR • the Ningaloo Marine Parks incorporate a diversity of habitats including the seabed of the Continental slope and shelf that supports demersal and benthic plants and animals including fish, molluscs, algae, sponges, soft corals and burrowing bivalves; as well as coral reefs and intertidal areas such as rocky shores and mangroves in State waters. Features and areas of ecological importance within the Central Western Shelf Transition have been identified as: • Ningaloo Marine Park – North West Cape.		

[8] Provincial bioregions were classified based on fish, benthic (seabed) habitat and oceanographic data at a scale that is useful for regional conservation planning and management (Ref. 27)

[9] Ningaloo Reef also extends into the Northwest Province, Central Western Transition Province, and a small portion of the Northwest Shelf Province. The geomorphology and biological communities of Ningaloo Reef are discussed in this bioregion summary.

IMCRA Provincial Bioregion^	OA	Hydrocarbon EMBA
Of these features and areas within the Central Western Shelf Transition, the shoreline component of the Hydrocarbon EMBA intersects with the State Ningaloo Marine Park (refer to Section 5.5.2 for further description of this feature).		
Central Western Transition	✖	✓
Characteristics of the geomorphology and biological communities of the Central Western Transition include: • the bioregion is characterised by large areas of Continental slope, with sediments dominated by muds and sands that decrease in grain size with increasing depth • about 40% of the bioregion occurs in waters depths greater than 4,000 m and the deepest areas of the bioregion occur within the Cuvier Abyssal Plain at ~5,330 m • a large part of the bioregion comprises the Cuvier Abyssal Plain • Wallaby Saddle is another important topographic feature within this bioregion and is the most extensive area of this type of topographic feature in the NWMR • the benthic slope communities of this bioregion comprise both tropical and temperate species along a north-south gradient • the biological communities of the Central Western Transition are thought to be distinctive owing to the proximity of deep ocean areas to the Continental slope and shelf, resulting in close interaction between pelagic species of the Cuvier Abyssal Plain and those of the slope and shelf • the harder substrate of the slope in waters of 200–2,000 m deep is likely to support populations of epibenthos such as bryozoans, sponges and encrusting coralline algae; these support larger infauna and benthic animals such as crabs, cephalopods, echinoderms and other suspension-feeding epibenthic organisms • in the deeper waters of the abyss, the benthic communities are likely to be sparse and include meiofauna (e.g. nematodes). Features and areas of ecological importance within the Central Western Transition have been identified as: • Wallaby Saddle • Cape Range Canyon and Cloates Canyon. Of these features and areas within the Central Western Transition, the Cape Range Canyon occur within the Hydrocarbon EMBA. Refer to Section 5.3.6.1 for further descriptions of these canyon features.		
Northwest Province	✓	✓
Characteristics of the geomorphology and biological communities of the Northwest Province include: • bioregion occurs entirely on the Continental slope and is comprised of muddy sediments • distinguished by a number of topographic features, such as the Exmouth Plateau, terraces and canyons (including the Swan and Cape Range canyons), as well as deep holes and valleys on the inner slope (including the Montebello Trough) • the benthic shelf and slope communities of this bioregion comprise both tropical and temperate species with a north-south gradient • the continental slope between North West Cape and the Montebello Trough has been identified as one of the most diverse slope habitats of Australia • the Exmouth Plateau is also likely to be an important area for biodiversity as it provides an extended area offshore for communities adapted to depths of ~1,000 m • information available on sediments in the bioregion indicates: – benthic communities are likely to include filter feeders and other epifauna – soft-bottom environments are likely to support patchy distributions of mobile epibenthos, such as sea cucumbers, ophiuroids, echinoderms, polychaetes and sea pens – biological communities within canyons in the bioregion are also poorly understood.		

IMCRA Provincial Bioregion^	OA	Hydrocarbon EMBA
Features and areas of ecological importance within the Northwest Province have been identified as: • Exmouth Plateau • canyons on the slope, including the Cape Range Canyon • demersal fish communities associated with the slope. Of these features and areas within the Northwest Province, the demersal fish communities associated with the slope, Exmouth Plateau and canyons on the slope also occur within the Hydrocarbon EMBA. Refer to Section 5.3.6.1 for further descriptions of these features.		
Northwest Shelf Province	✖	✓
Characteristics of the geomorphology and biological characteristics of the Northwest Shelf Province include: • bioregion occurs almost entirely on the continental shelf, except for a small area to the north of Cape Leveque that extends onto the Continental slope • this bioregion includes more than 60% of the continental shelf in the NWMR • continental shelf gradually slopes from the coast to the shelf break, but displays a number of seafloor features such as banks/shoals and holes/valleys, including: – Glomar Shoal occur in ~26–70 m water depth and are distinguished by highly fractured molluscan debris, coralline rubble and coarse carbonate sand – Leveque Rise (large plateau), which is one of only two shelf plateaux within the NWMR – significant areas of tidal sand waves or sandbanks (ranging in height ~5–10 m) occur on the inner-most reaches of Exmouth Gulf, and are one of only three major occurrences of this type of feature in the NWMR – shelf also contains several terraces and steps that extend into adjacent bioregions and reflect Ancient coastlines from when the sea level in the NWMR was lower; the most prominent of these occurs at a water depth of ~125 m. • sediment differentiation occurs on a north-south gradient – south of Broome, sediment is relatively homogenous and dominated by sands with small proportion of gravel – north of Broome, sediment is highly variable with sand or gravel dominance in no discernible spatial pattern – mud increases within ~100 km of the coast, and within ~100 km of the shelf break, but is mostly absent from other areas • sandy substrates on the shelf withing this bioregion are thought to support low density benthic communities of bryozoans, molluscs, and echinoids • sponge communities are also sparsely distributed on the shelf, but are found only in areas of hard substrate. Features and areas of ecological importance within the Northwest Shelf Province have been identified as: • Browse Island and surrounding waters • Lacepede Islands and surrounding waters • Quondong Point, north of Broome and surrounding waters • West coast of the Dampier Peninsula, including Beagle and Pender bays and surrounding waters • Pilbara coast (between Exmouth and Broome) and surrounding waters • Exmouth Gulf—Muiron Islands and surrounding waters • ancient coastline at 125 m depth contour • Glomar Shoal. Of these features and areas within the Northwest Shelf Province, the ancient coastline at 125 m depth contour occurs within the Hydrocarbon EMBA. Refer to Section 5.3.6.1 for further descriptions of this feature.		

IMCRA Provincial Bioregion^	OA	Hydrocarbon EMBA
Northwest Transition	✖	✓
Characteristics of the geomorphology and biological communities of the Northwest Transition include: • around half (52%) of the bioregion occurs on the Continental slope, with smaller areas in the north-west of the bioregion located on the Argo Abyssal Plain and continental rise • encompasses a range of water depths, from the shelf break (~200 m water depth) to ~5,980 m over the Argo Abyssal Plain • other topographic features within the bioregion include areas of rise, ridges, canyons and apron/fans • sediments of the slope are dominated by sands, whereas the sediments of the abyssal plain/deep ocean floor are dominated by muds • the bioregion also has reefs such as Mermaid, Clerke, and Imperieuse reefs, which are collectively known as the Rowley Shoals • the benthos of the deep ocean areas are likely to support meiofauna (e.g. nematodes), larger infauna (e.g. polychaete worms, isopods), and sparsely distributed epibenthic communities (e.g. sea pens) • mobile benthic species (e.g. deepwater sea cucumbers, crabs, polychaetes) are likely to be associated with the seafloor, and bioregion may support sparse populations of bentho-pelagic fish and cephalopods in low densities. Features and areas of ecological importance within the Northwest Transition have been identified as: • Rowley Shoals—Mermaid Reef Marine National Nature Reserve, Clerke and Imperieuse reefs and surrounding waters • Fish communities associated with the slope. Of these features and areas within the Northwest Transition, the fish communities associated with the slope occurs within Hydrocarbon EMBA. Refer to Section 5.3.6.1 for further descriptions of this feature.		

^*Source: Ref. 27*

5.3.1.1 Operational area

CAPL conducted surveys (Ref. 33) to characterise the marine environment as part of the Gorgon Backfill Fields Development OPP. Field surveys included benthic habitat, sediment, and benthic infauna data collection.

Habitat mapping within the OA (Ref. 33) identified that the proposed location for the G&E DC is primarily comprised of smooth seabed with bioturbation and scattered patches of bedforms with bare substrate to the north and north-east of the proposed DC. This BCH type is dominant within the broader OA, along with irregular seabed and smaller patches of mounds (Figure 5-2). Table 5-4 describes the BCH identified in the OA.

Ground truthing transect close to the proposed G&E DC confirmed the absence of complex seafloor structures and did not identify any epifaunal communities or benthic infauna (Figure 5-2). No records of endemic benthic infauna were found within this field observation transect (Ref. 33).

Table 5-4: BCH description

BCH	Description
Irregular seabed	Mostly flat sediment terrain with minor features which may be derived from underlying geology. Bathymetry is smooth with identifiable, regular but small bedforms or mounds. Fine or coarse sediment. Slope is typically <2°, with minor topographic features.

BCH	Description
Mound, bare substrate	Locally elevated sediment or rock veneer feature. Typically, an isolated, smooth edged feature with no structure which may be geological or biological in origin. Bathymetric features are measurable in profile. Slope can be varied, but smooth. No identifiable biological features on substrate but may include motile echinoderms and/or bioturbation.
Smooth seabed, bare substrate	Featureless sedimentary terrain. Bathymetry is smooth with no identifiable features. It can comprise of fine or coarse sediment; the slope is typically <2° with no topographic features. No identifiable biological features on substrate but may include motile echinoderms and/or bioturbation.

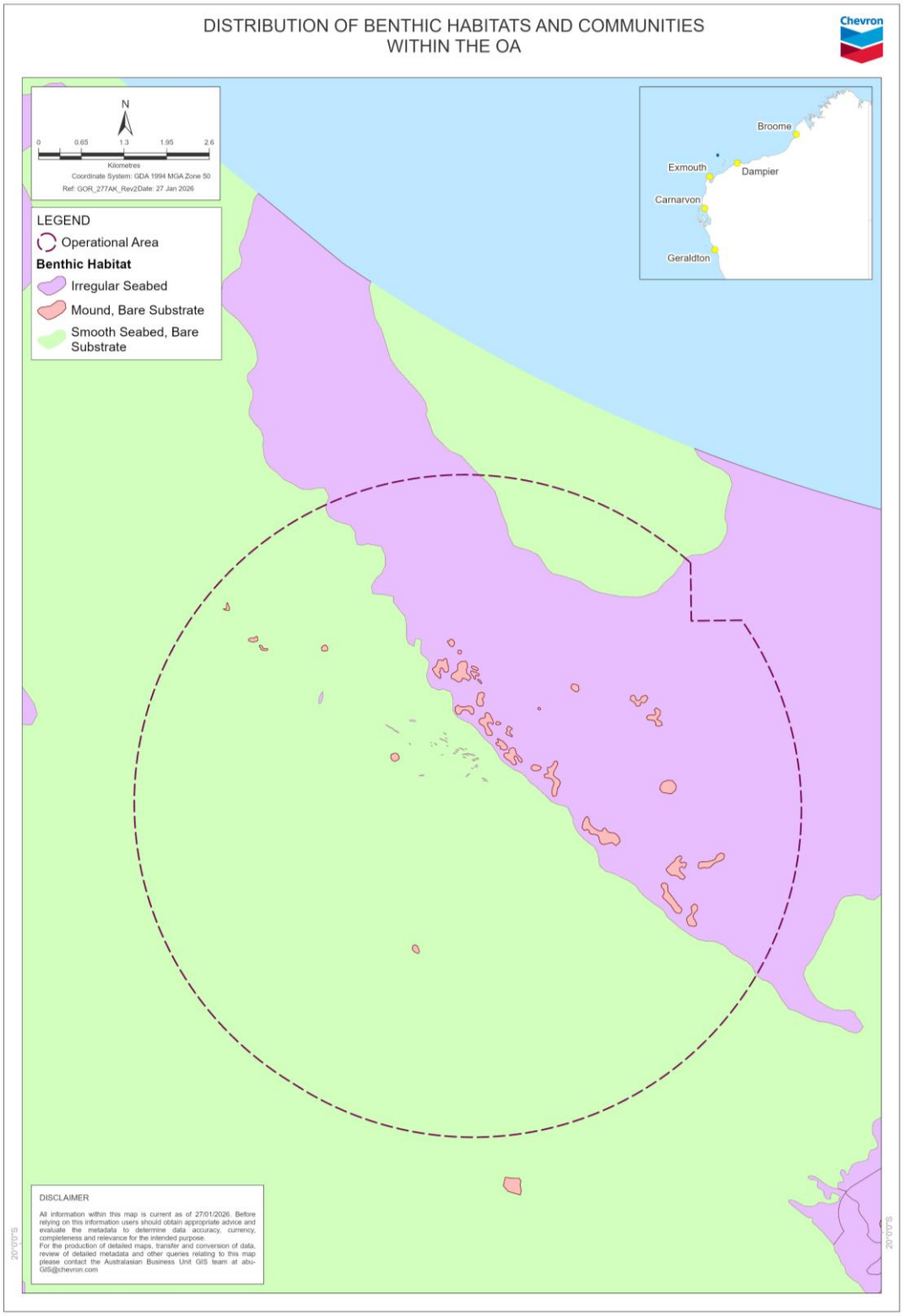


Figure 5-2. Distribution of BCH within the OA

5.3.1.2 Reefs, banks, and shoals

There are no shallow (<100 m water depth) complex bathymetric features within the OA. Rankin Bank occurs within the Hydrocarbon EMBA.

Rankin Bank is ~70 km north-east of the OA. Although Rankin Bank is not protected and is not a KEF, it is a large, complex bathymetrical feature on the outer western shelf of the west Pilbara region and represents habitats that are likely to play an important role in the productivity of the Pilbara region (Ref. 38). Rankin Bank has three submerged shoals delineated by the 50 m depth contour with water depths of ~18–30.5 m (Ref. 38). In 2013 and 2017, AIMS and Woodside co-invested in a project to better understand the habitats and complexity of the submerged shoal ecosystems. Rankin Bank represents a diverse marine environment, predominantly comprising consolidated reef and algae habitat (~55% cover), followed by hard corals (~25% cover), unconsolidated sand/silt habitat (~16% cover), and benthic communities comprising macroalgae, soft corals, sponges, and other invertebrates (~3% cover) (Ref. 38). The proportion of cover at Rankin Bank was highest for macroalgae and hard corals, particularly at depths <40 m, and cover decreased with increasing depth (Ref. 39). Encrusting corals (reaching cover of ~12.5%) at depths <40 m and solitary corals (~10% cover) primarily at 40–60 m depths were also present (Ref. 39). Other benthic taxa, including soft corals and sponges, were present in lower proportions at all depths (Ref. 39). The high cover of macroalgae and hard corals in shallower water depths are likely due to greater light penetration and lower sand cover (Ref. 39).

5.3.2 Coastal communities and habitats

Coastal communities are biological communities that inhabit the coastal zone. Coastal habitats are areas of shoreline types that do or can support these communities. Similar, to benthic communities (as described in Section 5.3.1), coastal communities are likely to play roles in maintaining the integrity and diversity of coastal ecosystems, and the supply of ecological services.

The OA occurs offshore and does not have any interface with the coast. The Hydrocarbon EMBA does interface with some coastal areas (due to predicted shoreline loading associated with unplanned hydrocarbon release events) including the west coasts of Barrow, Middle and Boodie islands, parts of Montebello, Peak, Observation, Sunday, and a number of other Pilbara inshore islands, as well as parts of the western and northern coast of the North West Cape (Figure 5-1). The coastal communities and habitats that may be present within the Hydrocarbon EMBA are summarised below.

Based on Smartline (Ref. 40), a spatial database containing geomorphic classifications for Australia’s coasts, the types of shoreline present within the Hydrocarbon EMBA include rocky coasts and sandy beaches (e.g. Barrow, Montebello, and Pilbara inshore islands), and tidal flats (e.g. parts of North West Cape).

The Seamap Australia spatial database collates and classifies marine and coastal habitats on the Australian continental shelf (Ref. 41). Based on this dataset, isolated areas of mangrove and saltmarsh may be present on Barrow Island and the North West Cape; and isolated areas of mangroves may be present on Montebello Islands.

Mangroves grow within the intertidal zone and are typically located within sheltered areas. The mangrove communities within the Montebello Islands are

considered globally significant as they occur in lagoons of offshore islands (Ref. 42). Coastal and marine baseline studies undertaken by CAPL (Ref. 43) identified that there are no mangrove stands on the west coast of Barrow Island, where the Hydrocarbon EMBA intersect with the coast. One species of mangrove, *Avicennia marina*, is known to occur in sparse stands on the north-east and southern coasts of Barrow Island (Ref. 43; Ref. 44).

Listed TECs and wetlands of international importance (Ramsar wetlands) are MNES under the EPBC Act, and a relevant value and sensitivity under the OPGGS(E)R. There are no known TECs or Ramsar wetlands within the Hydrocarbon EMBA.

5.3.3 Marine fauna

Listed threatened or migratory species are MNES under the EPBC Act, and a relevant value and sensitivity under the OPGGS(E)R. The following sections identify the potential presence of these species within the OA and Hydrocarbon EMBA.

Note: The Australian Government's Australian Marine Spatial Information System (AMSIS) (Ref. 45), geospatial datasets (Ref. 46), and a review of relevant recovery plans adopted under the EPBC Act (Section 3.2.2.1) were used to verify the presence of Biologically Important Areas (BIAs)[10] and habitat critical to survival (HCTS)[11] of the species within the OA and Hydrocarbon EMBA.

5.3.3.1 Marine mammals

Based on searches of the online PMST (Ref. 24; Appendix D), the threatened and/or migratory mammal species shown in Table 5-5 may be present within the OA and Hydrocarbon EMBA. The full list of marine species identified from the PMST is provided in Appendix D. HCTS of a species and BIAs associated with protected marine species are listed in Table 5-6 and Table 5-7.

For the threatened and/or migratory species with BIAs within the OA, additional information has been provided in the following subsections. Further details on other threatened and/or migratory species are included in the CAPL Planning Area Description of the Environment (Appendix G of the OSM-BIP [Ref. 5]).

The threatened and/or migratory cetaceans that may be present within the OA are predominantly low-frequency cetaceans[12] (e.g. Antarctic minke, blue, Bryde's, fin, humpback, and sei whales) and high-frequency cetaceans[13] (e.g. sperm whale, Australian humpback, Australian snubfin, and spotted bottlenose dolphins). Very-high-frequency cetaceans[14] (e.g. dwarf sperm and pygmy sperm whales) were also identified within the PMST (Ref. 24; Appendix D) as species or species

[10] BIAs are areas and times used by protected marine species for critical life functions, such as reproduction, feeding, migration or resting (Ref. 47). These behaviours are referred to as biologically important behaviours.

[11] HCTS of a species or ecological community are areas necessary (i) for activities such as foraging, breeding, roosting, or dispersal; (ii) for the long-term maintenance of the species or ecological community; (iii) to maintain genetic diversity and long-term evolutionary development; or (iv) for the reintroduction of populations or recovery of the species or ecological community (Ref. 48). HCTS may be identified within a recovery plan for the species or ecological community (Ref. 48).

[12] Low-frequency cetaceans are the functional cetacean hearing group that are specialised for hearing low frequencies (e.g. baleen whales).

[13] High-frequency cetaceans are the functional cetacean hearing group that are specialised for hearing high frequencies (e.g. toothed whales, beaked whales, dolphins).

[14] Very high-frequency cetaceans are the functional cetacean hearing group that are specialised for hearing very high frequencies (e.g. *Kogia* spp.).

habitat that may occur within the OA, however, these species are not listed as threatened and/or migratory under the EPBC Act. As shown in Table 5-6, except for pygmy blue whales, there are no other known BIAs, HCTS, or aggregation areas for cetacean species that intersect with the OA; as such, it is expected that any presence of cetacean species would be of a transitory nature.

CAPL deployed three acoustic loggers for a full year period in 2019 located at various sites and depths adjacent to the existing Jansz field infrastructure (~30 km north-west of the OA). Several species of cetaceans were identified, including pygmy blue, Antarctic blue, Omura's, Bryde's, dwarf minke, Antarctic minke, fin, humpback, sei and sperm whales. Small odontocetes (e.g. dolphins) were also detected (Ref. 49). Further soundscape monitoring was undertaken from late-2021 to early-2023 using acoustic loggers deployed over a broader (~200 km x 200 km) area extending around the Jansz infrastructure (Ref. 50). There were no additional cetacean species that were not already identified from the 2019 monitoring described above identified during the 2021–2023 period.

Table 5-5: Presence of threatened and/or migratory marine mammals

Common name	OA	Hydrocarbon EMBA
Cetaceans (whales)		
Antarctic minke whale (*Migratory*)^	✓	✓
Blue whale (*Endangered, migratory*)	✓	✓
Bryde's whale (*Migratory*)^	✓	✓
Fin whale (*Vulnerable, migratory*)^	✓	✓
Humpback whale (*Migratory*)^	✓	✓
Omura's whale (*Migratory*)^	✓	✓
Sei whale (*Vulnerable, migratory*)^	✓	✓
Southern right whale (*Endangered, migratory*)	×	✓
Sperm whale (*Migratory*)^	✓	✓
Cetaceans (dolphins)		
Australian humpback dolphin (*Vulnerable, migratory*)	✓	✓
Australian snubfin dolphin (*Vulnerable, migratory*)	✓	✓
Killer whale (*Migratory*)	✓	✓
Spotted bottlenose dolphin (*Migratory*)	✓	✓
Sirenians		
Dugong (*Migratory*)	×	✓

^*Species presence identified in 2019 Jansz-Io Soundscape monitoring (Ref. 49).*

Table 5-6: Presence of BIAs for marine mammals

Common name	BIA behaviour	Seasonal presence	OA	Distance from the OA	Hydrocarbon EMBA
Dugong	Breeding	Year round	×	~202 km	✓
	Calving	Year round	×	~202 km	✓
	Foraging (high density	Year round	×	~202 km	✓

Common name	BIA behaviour	Seasonal presence	OA	Distance from the OA	Hydrocarbon EMBA
	seagrass beds)				
	Nursing	Year round	×	~202 km	✓
Humpback whale	Migration (north and south)	Northern migration, late July to September	×	~48 km	✓
	Resting	Winter	×	~205 km	✓
Pygmy blue whale	Migration	Northern migration (enter Perth canyon January to May; pass Exmouth April to August; continue north to Indonesia) southern migration (follow WA coastline from October to late December)	✓	Intersects the OA	✓
	Possible foraging area	Not identified in the database	×	~220 km	✓
Southern right whale	Migration	Approximately April to October	×	~207 km	✓
	Reproduction	Approximately May to September	×	~206 km	✓

Table 5-7: Presence of HCTS of marine mammal species

Common name	HCTS location	Seasonal presence	OA	Distance from the OA	Hydrocarbon EMBA
Southern right whale	All reproductive BIAs	May to September	×	~206 km	✓

5.3.3.1.1 Pygmy blue whales

The pygmy blue whale (*Balaenoptera musculus brevicauda*) is a subspecies of the blue whale. The blue whale is listed as endangered and migratory under the EPBC Act. A migration BIA for the pygmy blue whale overlaps the OA and Hydrocarbon EMBA. A 'possible foraging area' BIA (off the North West Cape) overlaps with the Hydrocarbon EMBA (Table 5-6; Figure 5-5).

It was estimated by McCauley and Jenner (Ref. 51) that 662–1,559 pygmy blue whales migrated south past Exmouth in 2004. This is similar to abundance estimates of 532–1,754 blue whales at the Perth Canyon between 1999/2000 to 2004/2005 (Ref. 52). A more recent preliminary abundance estimate by McCauley et al. (Ref. 53) indicated that ~3,554 pygmy blue whales migrated north through the NWS region during 2022. It is unknown what proportion of the total population these seasonal migratory estimates encompass (Ref. 51; Ref. 52).

Migration

Pygmy blue whales migrate along the west coast of Australia in the northern direction to their breeding grounds near the Indonesian Archipelago from approximately January to August (passing through the Perth Canyon region earlier [January to May] than Exmouth [April to August] before continuing north); then south to their feeding grounds in the Southern Ocean from approximately mid-November to early-January (Ref. 51; Ref. 54). Information collected from satellite tags shows that the Banda and Molucca seas in Indonesia are the likely

destination for the northern migration of whales that feed off the Perth Canyon (Ref. 55; Ref. 56; Ref. 57). These seas are considered the northern terminus of the migration and potentially the whales' breeding and calving ground, but may also act as a feeding area (Ref. 58; Ref. 59).

Acoustic monitoring analysed by McCauley and Jenner (Ref. 51), including sites off the North West Cape and north of Montebello Islands, identified pygmy blue whales migrating south pass the Exmouth area through November to late-December with a comparatively short burst of animals passing (Ref. 51). The pygmy blue whales migrate north passing the Exmouth–Montebello Islands area over a more protracted period ranging from April to August (Ref. 51). The shorter southbound compared to northbound migratory period suggests the animals are swimming purposely through the area to reach southern feeding areas (Ref. 51). A difference in travel speed for pygmy blue whales was also reported by Thums et al. (Ref. 60), where median speed during northward migration was 2.4 km/h (<0.1–15.4 km/h, n=22), and southward migration was 4.0–5.0 km/h (n=2).

CAPL's passive acoustic loggers deployed over 2019–2023 (29 instruments; adjacent to existing Jansz field infrastructure and more broadly over the region[15]) have detected pygmy blue whales migrating south past the Jansz location from early-October to late-January of the following year (peak late-November to early-December); and north from late-March to mid-September (peak late-May to June) (Ref. 53). These migration periods are in agreement with McCauley and Jenner (Ref. 51), Double et al. (Ref. 58) and McCauley et al. (Ref. 61). During the 2019 soundscape monitoring pygmy blue whale song was detected on more days than any other type of mysticete (baleen whale) sound (Ref. 49). Higher numbers of singers were detected during the northern migration compared to southern migration (Ref. 53). The presence of migratory whales was also observed to vary temporally and spatially each year (Ref. 50; Ref. 53).

Predictions from modelling based on passive acoustic data indicate greatest numbers of pygmy blue whales during April and June/July (northern migration), and November and December (southern migration) (Ref. 60). Monthly spatial predictions indicated higher densities around the Montebello Island region during May and June (northern migration) and November and December (southern migration) (Ref. 60).

Previous descriptions, including within the *Conservation Management Plan for the Blue Whale*, of the migration route for pygmy blue whales along the WA coast are that they "tend to pass along the shelf edge at depths between 500 m to 1,000 m" (Ref. 26; Ref. 52). These descriptions appear to have been sourced from acoustic data for a southerly migration of pygmy blue whales past Exmouth, where it was observed that most pygmy blue whales pass along the shelf edge out to water depths of 1,000 m but centred near the 500 m depth contour (Ref. 51). The use of the continental slope habitat in WA is in contrast to southern Australia where use of the continental shelf and shelf break predominates (Ref. 60).

Literature (e.g. Ref. 51; Ref. 54; Ref. 58) supports that many pygmy blue whales follow the continental shelf edge when south of the North West Cape on their north and south migrations. However, north of the North West Cape the pygmy blue whales are more likely to transit through deeper and further offshore waters (e.g. Ref. 53; Ref. 54; Ref. 58).

[15] Refer to soundscape survey area shown in Figure 5-4.

Double et al. (Ref. 58) described tagged pygmy blue whales (2009, 2011) during their northern migration as travelling relatively near to the Australian coast (100±1.7 km) in water depths of 1,369.5±47.4 m, until reaching the North West Cape, after which they travelled further offshore (238±14 km) into progressively deeper water (2,617±143.5 m). Data from tagged pygmy blue whales (2020) also indicated that during their northern migration, the width of the migration corridor increases north of Montebello Islands from ~175 km to ~690 km at its widest point (Ref. 60). Gavrilov et al. (Ref. 54) conducted a study using an array of ocean bottom seismographs to detect pygmy blue whales traversing the area to the north-west of the North West Cape during their southern migration. This study found that pygmy blue whales migrated southward much further from the WA coast compared to the northbound migration, at distances of up to 400 km from the coast (Ref. 54).

Based on analysis of CAPL's passive acoustic monitoring data (2019–2023) the northern migration corridor through the Jansz region is broad (i.e. extends further west than the survey area) and had two focal points: one just west of the continental shelf edge[16], and one ~65 km west of Jansz field infrastructure[17] (Ref. 53). The focal point for the southern migration corridor was also detected ~65 km to the west of the Jansz field infrastructure (Ref. 53). The results of this passive acoustic monitoring data are consistent with previous studies indicating broader migration corridors north of the North West Cape.

Ferreira et al. (Ref. 62) analysed available satellite tracking data for pygmy blue whales (n=38) and environmental data to predict habitat suitability for migration. The analyses determined that areas of high relative habitat suitability for migration were identified along the shelf break (200 m bathymetry contour) and slope between Windy Harbour and Scott Reef, and also in deep areas offshore of Rowley Shoals. From Cape Leeuwin to Ningaloo Reef, the suitable habitat was associated predominantly with the continental slope. North of Ningaloo Reef (and extending to Ashmore Reef) there was a separation of suitable migration habitat between the deep ocean basin area and slope habitat (Ref. 62). The OA does not intersect with areas 'validated as suitable habitat' for migration (Figure 5-4).

Thums et al. (Ref. 60) incorporated data collected from both passive acoustic monitoring (46 instruments, 2006 to 2019) and satellite telemetry data (22 tag deployments, 2009 to 2021) to determine the 'most important areas' for migration[18] along the WA coast. This analysis identified an almost continuous area from southern WA to around the latitude of Rowley Shoals; and thereafter was more dispersed (Ref. 60). The OA does intersect with these 'most important areas' for migration (Figure 5-4).

Therefore, while the OA intersects with the migration BIA for pygmy blue whales, it is expected, based on satellite tracking and acoustic detection studies, that pygmy blue whales have a broader migration corridor at this latitude (i.e. extending further offshore than the defined BIA).

Foraging

Blue whales aggregate in productive upwelling or frontal regions worldwide to prey on dense but patchy krill aggregations (Ref. 63). Pygmy blue whales aggregate in the Austral summer to feed at known locations on or adjacent to the continental

[16] Where 'continental shelf edge' is defined as the 200 m water depth contour.

[17] This is indicated by the ~260 km distance from mainland in Figure 5-4.

[18] Grid cells with overlap between two metrics: largest percentage of whales and high move persistence, were designated as the 'most important areas' for migration (Ref. 60).

shelf including the Perth Canyon, Great Southern Australian Coastal Upwelling System, and the sub-tropical convergence zone (Ref. 60). The areas around the Perth Canyon and Australian Coastal Upwelling System correspond to 'Foraging Areas'[19] and 'Known Foraging Areas' within the *Conservation Management Plan for the Blue Whale* (Ref. 52). Blue whales have the highest known prey requirements of any predator, and Foraging Areas are therefore generally associated with areas of high primary productivity that can support sufficient densities of krill, such as oceanographic upwelling or frontal systems (Ref. 52). The *Conservation Management Plan for the Blue Whale* (Ref. 52) also identifies 'Possible Foraging Areas'[20], including two in WA, one off the Ningaloo coast, and another around Scott Reef. These 'Possible Foraging Areas' have been characterised as foraging BIAs and occur ~220 km south-west and ~880 km north-east of the OA respectively.

Analyses by Ferreira et al. (Ref. 62) determined that suitable habitat for foraging was identified as a large semi-continuous area from the southern extent (28°S) to the north-eastern edge of the modelled region (11.5°S). The model indicated high habitat suitability extending out from the continental shelf break (200 m bathymetry contour) in the north-west of WA; with the highest relative suitability occurring from just south of Shark Bay to Scott Reef along the continental shelf break and slope, and also extending to the Exmouth Plateau (Ref. 62). The study indicates suitable habitat is related to dynamic and localised oceanic processes that may occur at different temporal scales (Ref. 62). The OA does occur within areas 'validated as suitable habitat' for foraging (Figure 5-3).

Thums et al. (Ref. 60) determined that pygmy blue whale movement off north-west WA was predominantly relatively fast, directed travel (high move persistence) interspersed with relatively short (median 28 h) periods of low move persistence (Ref. 60). This high move persistence is indicative of migration, while the low move persistence is generally indicative of foraging (Ref. 60). Data collected from both passive acoustic monitoring and satellite telemetry data, was analysed and determined the 'most important areas' for foraging[21] along the WA coast included the Perth Canyon and vicinity, the shelf edge off Geraldton, and discontinuous use of the shelf edge from Ningaloo Reef to Rowley Shoals (Ref. 60). These spatially non-continuous foraging areas may be used by pygmy blue whales during their migration north in the Austral winter (Ref. 64). Although foraging areas are described as static, they are likely to be dynamic given their dependence on presence of prey (Ref. 60; Ref. 65). Feeding behaviour appears to be largely a function of prey availability and their associated oceanographic drivers (i.e. surface currents, light attenuation, upwellings, and seabed features) (Ref. 62; Ref. 66; Ref. 67). The OA does not intersect with these most important areas for foraging (Figure 5-5).

Thums et al. (Ref. 64) analysed diving behaviour of nine tagged pygmy blue whales to determine where foraging actually occurs during their northern migration. Three main foraging areas were identified based on where foraging and

[19] The *Conservation Management Plan for the Blue Whale* (Ref. 52) defines a Foraging Area as "blue whales are regularly observed on a seasonal basis", and a Known Foraging Area is "[k]nown foraging occurs in these areas but is highly variable both between and within seasons".

[20] The *Conservation Management Plan for the Blue Whale* (Ref. 52) defines a Possible Foraging Area as "[e]vidence of feeding is based on limited direct observations or through indirect evidence, such as occurrence of krill in close proximity to whales, or satellite tagged whales showing circling tracks. Blue whales travel through on a seasonal basis, possibly as part of their migratory route".

[21] Grid cells with overlap between three metrics: greatest time spent, largest percentage of whales, and lowest move persistence, were designated as the 'most important areas' for foraging (and/or resting/breeding) (Ref. 60).

feeding dives occurred: Perth Canyon to offshore of Jurien Bay; adjacent to Geraldton and the Abrolhos Islands, and offshore of Ningaloo (extending from near Coral Bay to offshore of the Montebello Islands) (Ref. 64). However, it was noted that more opportunistic foraging occurred off north-west Australia where foraging dives were shallower, horizontal travel rates faster, and there was an absence of a diurnal pattern in diving (Ref. 64). This suggests a reliance on more ephemeral prey in north-west Australia than off south-west Australia where whales have high residency. The foraging/feeding behaviours observed in this study provide support for use of a mixed breeding strategy (income and capital) in pygmy blue whales (Ref. 64).

A review by Pattiaratchi (Ref. 68) demonstrated that there were no oceanographic features (including bathymetry, currents and eddies, chlorophyll concentrations) within the Jansz area that may lead to higher primary productivity and/or an increased likelihood of pygmy blue whale foraging in the area. Sonar surveys to determine the presence of sufficient biomass of prey to support foraging pygmy blue whales were undertaken by McCauley and Erbe (Ref. 69). This study indicated that the Jansz area may be able to support opportunistic feeding in surface waters (<100 m water depth) for short durations (hours); however, in comparison to known prey aggregations observed at Perth Canyon, the biomass observed at the Jansz area is unlikely to represent a consistent and reliable feeding area (Ref. 69). Therefore, Jansz and surrounding areas, which include the OA, are not considered to represent a Foraging Area, but may provide opportunistic foraging if the environmental conditions provide for the aggregation of prey at sufficient quantities at the time a pygmy blue migrates through the area. This is consistent with studies of tagged pygmy blue whales that demonstrated more opportunistic foraging in north-west Australia, compared to southern areas (e.g. Perth Canyon, Ningaloo) (Ref. 64).

Owen et al. (Ref. 70) deployed a multi-sensor tag on a single pygmy blue whale and tracked its movement from the Perth Canyon region to Geraldton. The whale completed a total of 1,677 dives over the duration of the tag was attached (7.6 days). Three types of movement behaviour (migratory, exploratory dives, and feeding [lunge dives]) were identified. The feeding behaviours (lunge dives) were characterised by a mean maximum depth of 129±183 m (range 13–505 m) and a mean dive duration of 5.2 minutes for shallow feeding and 11.4 minutes for deep feeding.

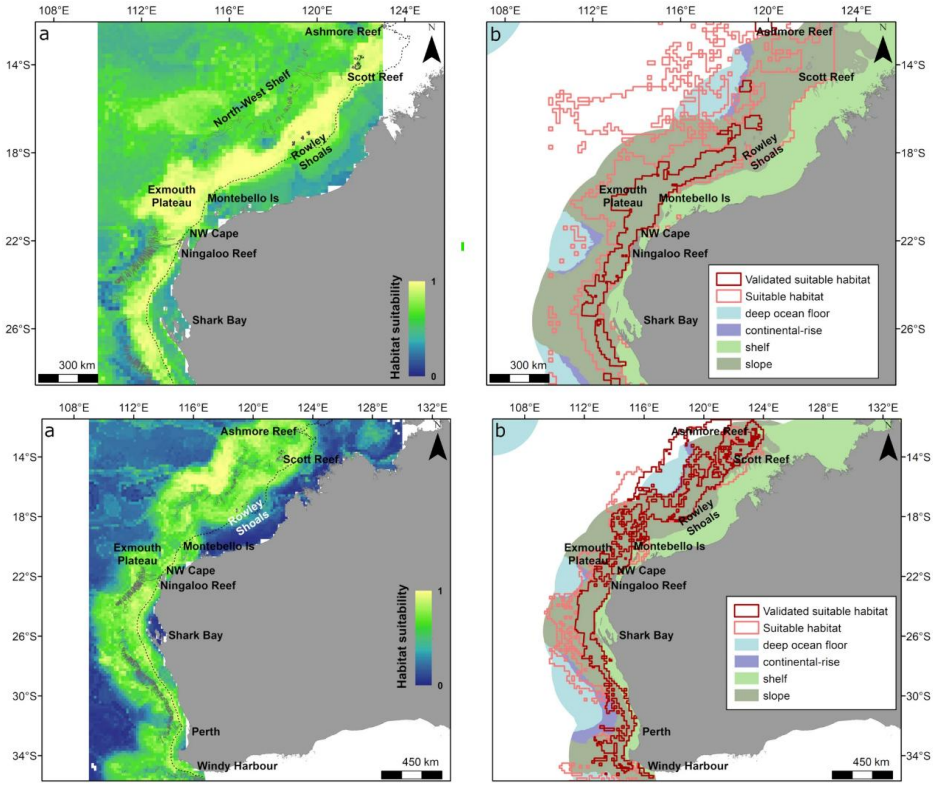
Based on analysis of nine tagged pygmy blue whales (eight at Perth Canyon, one at Ningaloo), Thums et al. (Ref. 64) determined that maximum dive depths of foraging and lunge feeding dives were deeper in the Perth (321 m, 31–540 m) and Geraldton (338 m, 64–483 m) regions, followed by Savu Sea (176 m, 42–259 m), with Ningaloo being the shallowest (99 m, 39–306 m) (Ref. 64). As part of a different study, Thums et al. (Ref. 60) also describes 10 of the 24 pygmy blue whales that were encountered during a 2020 field trip off the North West Cape were observed to be surface feeding (implied by the visible baleen and pleats on the surface).

Biologically, surface feeding is an optimal behavioural response for pygmy blue whales, given the significantly reduced energetic costs associated with this strategy over lunge feeding at depth, which requires a significant oxygen and energetic demand (Ref. 71). Studies have demonstrated that feeding at depth is thought to only be energetically efficient if krill density at depth is three times higher than in surface waters (Ref. 71). Studies in several locations where pygmy blue whales are known to aggregate (southern Australia [Ref. 72], New Zealand

[Ref. 71]; California [Ref. 73], Canada [Ref. 74]; Chile [Ref. 75]) have demonstrated evidence of surface or sub-surface (<100 m) foraging, determined through visual observations of lunge feeding and/or analysis of tagged data. In these instances, surface foraging was driven by the aggregation of krill at the surface (or sub-surface). Torres et al. (Ref. 71) noted that surface foraging adheres to the principles of the 'optimal foraging theory', which states that to maximise fitness, an animal adopts a foraging strategy that provides the most benefit (i.e. energy) for the lowest cost, thereby maximising the net energy gained.

Pattiaratchi (Ref. 68) demonstrated that chlorophyll production within the Pilbara region was highest in <100 m of water depth (particularly in summer), where sufficient light still penetrates to allow for photosynthesis and nutrients are highest within the thermocline (80–100 m). In winter the data demonstrated that the chlorophyll was mixed throughout the upper 80–100 m, corresponding to the well-mixed conditions in the upper surface waters. There is a generally accepted correlation between increased chlorophyll production (i.e. phytoplankton biomass) and increased krill density (Ref. 76). Furthermore, a krill biomass survey undertaken by McCauley and Erbe (Ref. 69) demonstrated that around the Jansz field region, aggregations of krill dense enough to support opportunistic feeding by pygmy blue whales were only found within surface or sub-surface waters (<100 m).

In summary, a range of evidence (i.e. visual observations of feeding individuals, diving data from tagged whales, prey biomass surveys and biological theory) indicates that pygmy blue whales within the Pilbara region preferentially forage at the surface or sub-surface, where studies demonstrates that productivity is concentrated within the photic zone (<100 m).



Source: Ref. 62

Figure 5-3: Predicted habitat suitability for foraging (top panel) and migration (bottom panel)

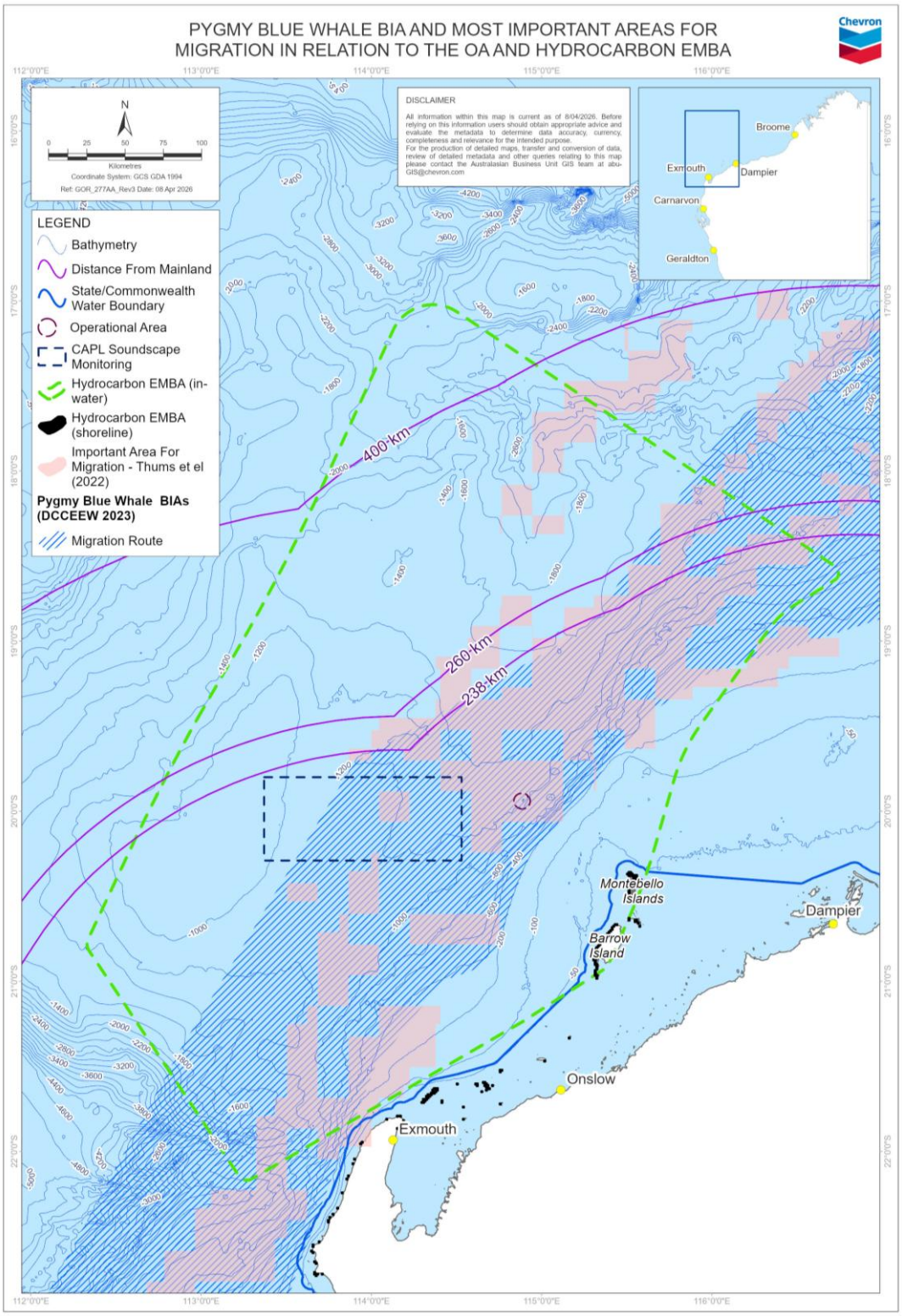


Figure 5-4: Pygmy blue whale BIA and most important areas for migration in relation to the OA and Hydrocarbon EMBA

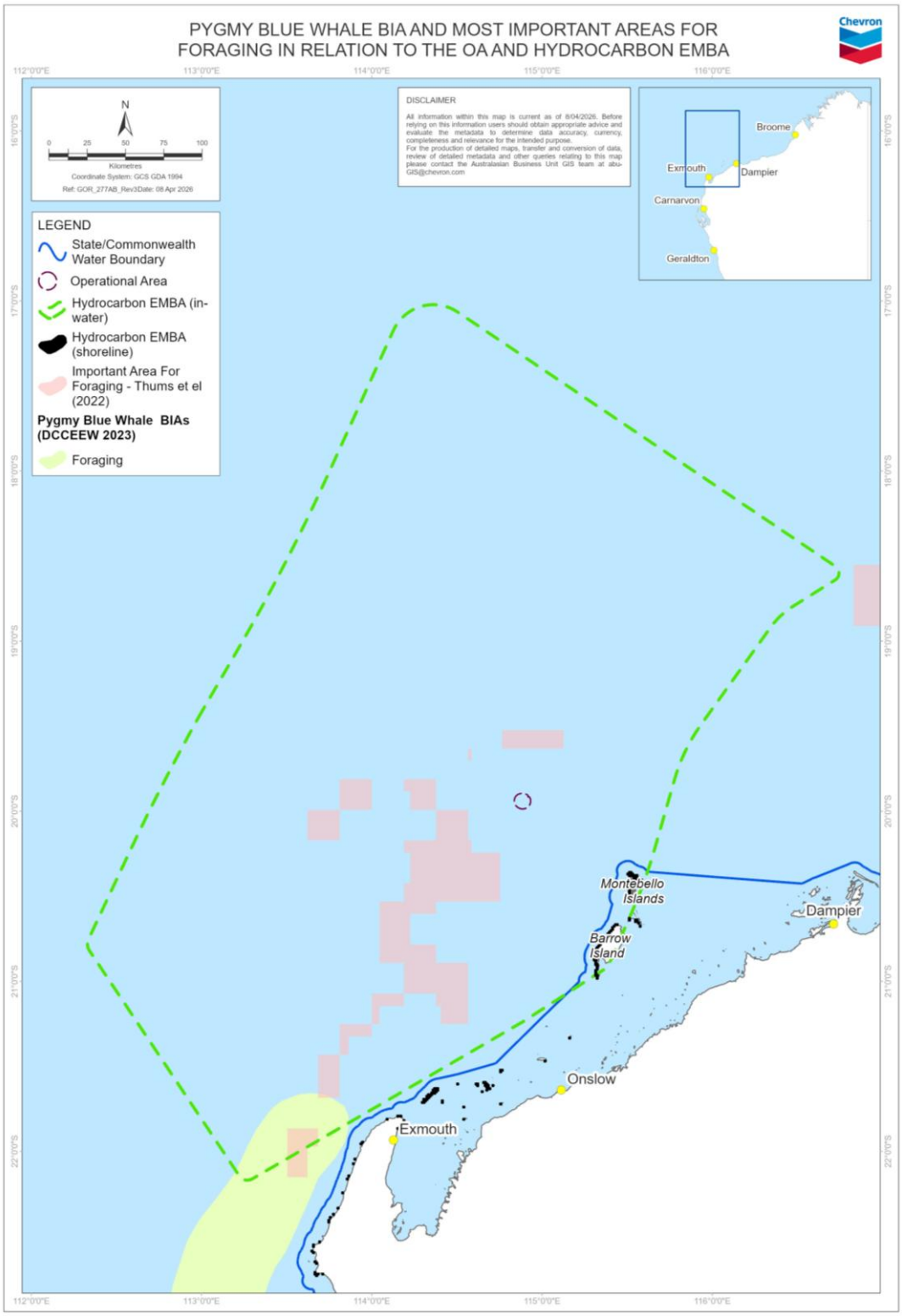


Figure 5-5: Pygmy blue whale BIA and most important areas for foraging in relation to the OA and Hydrocarbon EMBA

5.3.3.2 Marine reptiles

Based on searches of the online PMST (Ref. 24; Appendix D), the threatened and/or migratory reptile species shown in Table 5-8 may be present within the OA and Hydrocarbon EMBA. The full list of marine species identified from the PMST is provided in Appendix D. HCTS of a species and BIAs associated with protected marine species are listed in Table 5-9 and Table 5-10, respectively.

No threatened and/or migratory species with BIAs, or HCTS of a species, were identified within the OA. Further details on other threatened and/or migratory species are included in the CAPL Planning Area Description of the Environment (Appendix G of the OSM-BIP [Ref. 5]).

The salt-water crocodile was identified within the PMST as potentially being present within the OA, however this species is not considered likely to be present. The salt-water crocodile inhabits Australian coastal waters, estuaries, lakes, inland swamps, and marshes (Ref. 77). The OA occurs offshore and is >75 km west-northwest of Montebello Islands. There are no islands or other emergent features within or adjacent to the OA.

Table 5-8: Presence of threatened and/or migratory marine reptiles

Common name	OA	Hydrocarbon EMBA
Crocodiles		
Salt-water crocodile (*Migratory*)	✓	✓
Marine turtles		
Flatback turtle (*Vulnerable, migratory*)	✓	✓
Green turtle (*Vulnerable, migratory*)	✓	✓
Hawksbill turtle (*Vulnerable, migratory*)	✓	✓
Leatherback turtle (*Endangered, migratory*)	✓	✓
Loggerhead turtle (*Endangered, migratory*)	✓	✓
Sea snakes		
Leaf-scaled sea snake (*Critically Endangered*)	×	✓
Short-nosed sea snake (*Critically Endangered*)	×	✓

Table 5-9: HCTS of marine turtles

Common name	Nesting location	Internesting buffer	Seasonal presence	OA	Distance from the OA	Hydrocarbon EMBA
Flatback turtle[22]	Barrow Island, Montebello Islands, coastal islands from Cape Preston to Locker Island	60 km	October to March	×	~16 km	✓
Green turtle	Barrow Island, Montebello	20 km	November to March	×	~57 km	✓

[22] Although the PMST report (Appendix D) indicates the HCTS for flatback turtles overlaps with the OA, the PMST map viewer (figure attached in Appendix D), the AMSIS map viewer and the geological dataset from the DCCEEW do not show any overlap.

Common name	Nesting location	Internesting buffer	Seasonal presence	OA	Distance from the OA	Hydrocarbon EMBA
	Islands, Serrurier Island, and Thevenard Island					
	Exmouth Gulf and Ningaloo Coast	20 km	November to March	×	~192 km	✓
Hawksbill turtle	Cape Preston to mouth of Exmouth Gulf including Montebello Islands and Lowendal Islands	20 km	October to February	×	~55 km	✓
Loggerhead turtle	Exmouth Gulf and Ningaloo Coast	20 km	November to May	×	~192 km	✓

Table 5-10: Presence of BIAs for marine reptiles

Common name	BIA behaviour	Seasonal presence	OA	Distance from the OA	Hydrocarbon EMBA
Flatback turtle	Aggregation	Not identified in the database	×	~75 km	✓
	Foraging	Early in summer	×	~75 km	✓
		Not identified in the database	×	~75 km	✓
	Internesting	Not identified in the database	×	~75 km	✓
	Internesting buffer	Early in summer[23]	×	~19 km	✓
		Summer	×	~70 km	✓
	Mating	Early in summer	×	~75 km	✓
		Year round	×	~75 km	✓
	Nesting	Early in summer	×	~75 km	✓
		Short summer nesting season, predominantly November-March with peak in January	×	~90 km	✓
		Summer	×	~150 km	✓
Green turtle	Aggregation	Not identified in the database	×	~75 km	✓
	Basking	Summer	×	~90 km	✓
	Foraging	Green Turtle aggregation inside of NW Is. Early in summer	×	~75 km	✓
		Not identified in the database	×	~75 km	✓

[23] Although the PMST report (Appendix D) indicates the internesting buffer BIA for flatback turtles overlaps with the OA, the PMST map viewer (figure attached in Appendix D), the AMSIS map viewer and the geospatial dataset from the DCCEEW do not show any overlap.

Common name	BIA behaviour	Seasonal presence	OA	Distance from the OA	Hydrocarbon EMBA
		Summer	×	~70 km	✓
		Year round	×	~90 km	✓
	Internesting	Not identified in the database	×	~75 km	✓
		Summer	×	~70 km	✓
	Internesting buffer	Green Turtle aggregation inside of NW Is. Early in summer	×	~55 km	✓
		Summer	×	~50 km	✓
	Mating	Green Turtle aggregation inside of NW Is. Early in summer	×	~75 km	✓
		Not identified in the database	×	~75 km	✓
		Summer	×	~70 km	✓
	Nesting	Green Turtle aggregation inside of NW Is. Early in summer	×	~75 km	✓
		Summer	×	~70 km	✓
Hawksbill turtles	Foraging	Early in summer	×	~75 km	✓
		Spring and early summer, peak nesting October	×	~92 km	✓
		Year round	×	~90 km	✓
	Internesting	Spring and early summer, peak nesting October	×	~92 km	✓
	Internesting buffer	Early in summer	×	~55 km	✓
		Not identified in the database	×	~80 km	✓
		Peak nesting in spring and early summer	×	~70 km	✓
		Spring and early summer, peak nesting October	×	~68 km	✓
		Year round	×	~137 km	✓
	Mating	Early in summer	×	~75 km	✓
		Spring and early summer, peak nesting October	×	~92 km	✓
		Year round	×	~90 km	✓
	Nesting	Early in summer	×	~75 km	✓
		Not identified in the database	×	~98 km	✓
		Peak nesting in spring and early summer	×	~90 km	✓
		Spring and early summer, peak nesting October	×	~85 km	✓
		Year round	×	~75 km	✓
Loggerhead turtles	Internesting buffer	Not identified in the database	×	~62 km	✓

Common name	BIA behaviour	Seasonal presence	OA	Distance from the OA	Hydrocarbon EMBA
	Nesting	Not identified in the database	×	~82 km	✓

5.3.3.3 Fishes, including sharks and rays

Based on searches of the online PMST (Ref. 24; Appendix D), the threatened and/or migratory fish species shown in Table 5-11 may be present within the OA and Hydrocarbon EMBA. The full list of marine species identified from the PMST is provided in Appendix D. HCTS of a species and BIAs associated with protected marine species are listed in Table 5-12 and Table 5-13. No BIAs or HCTS of listed threatened species were identified within the OA (Ref. 409; Ref. 487; Ref. 488).

Further details on other threatened and/or migratory species are included in the CAPL Planning Area Description of the Environment (Appendix G of the OSM-BIP [Ref. 5]).

A fish assemblage survey was undertaken as part of the benthic survey (Ref. 33) that supported the Backfill Fields Development OPP. While no fish assemblage survey sites were located directly within the G&E fields, there were survey sites in adjacent fields of similar water depths.

Across all survey sites, observations were predominantly pelagic fishes (Ref. 33). The fish assemblages of the deeper continental slope were mostly dominated by Carangidae, Macrouridae (rat tails), Halosauridae (halosaurs) and unidentified anguilliform (eel-like) fishes (Ref. 33). Pelagic fishes are generally considered mobile and/or transient in nature (Ref. 78). The demersal fishes observed throughout soft sediment habitats (Ref. 33) are also generally mobile taxa without any site attachment (Ref. 78).

The survey results also indicated the presence of distinct fish assemblages, which were strongly influenced by water depth and water masses; this included a distinct assemblage associated with the deeper waters of >800 m depth and the Antarctic Intermediate Water mass (Ref. 33). The lowest fish diversity and abundance was observed within the deeper Antarctic Intermediate Water mass of the Exmouth Plateau KEF area (>50 km further offshore from the OA).

Table 5-11: Presence of threatened and/or migratory fishes, including sharks and rays

Common name	OA	Hydrocarbon EMBA
Sharks		
Dwarf sawfish (*Vulnerable, migratory*)	✓	✓
Green sawfish (*Vulnerable, migratory*)	✓	✓
Grey nurse shark (*Migratory*)	✓	✓
Grey nurse shark (west coast population) (*Vulnerable*)	✓	✓
Largetooth sawfish (*Endangered, migratory*)	✓	✓
Longfin mako (*Migratory*)	✓	✓
Narrow sawfish (*Migratory*)	✓	✓
Oceanic whitetip shark (*Migratory*)	✓	✓
Porbeagle (*Migratory*)	×	✓

Common name	OA	Hydrocarbon EMBA
Scalloped hammerhead (*Conservation dependent*)	✓	✓
Shortfin mako (*Migratory)*	✓	✓
Whale shark (*Vulnerable, migratory*)	✓	✓
White shark (*Vulnerable, migratory*)	✓	✓
Rays		
Giant manta ray (*Migratory*)	✓	✓
Reef manta ray (*Migratory*)	✓	✓

Table 5-12: Presence of BIAs for fishes, including sharks and rays

Common name	BIA behaviour	Seasonal presence	OA	Distance from the OA	Hydrocarbon EMBA
Whale shark	Foraging	Spring[24]	×	~20 km	✓
	Foraging (high density prey)	April to June, Autum	×	~218 km	✓

Table 5-13: Presence of HCTS fishes, including sharks and rays

Common name	HCTS location	OA	Hydrocarbon EMBA
Dwarf sawfish	Areas where aggregations of individuals have been recorded displaying biologically important behaviour such as breeding, foraging, resting or migrating, are considered critical to the survival of the species (Ref. 409)	×	May be present (based on species distribution mapping for the 'species or species habitat likely to occur' category (Ref. 79); and the distribution mapping of the 'adult/juvenile sawfish known to occur' and 'pupping likely to occur' categories from Figure 1c of the Recovery Plan (Ref. 409).
Green sawfish		×	May be present (based on species distribution mapping within the 'species or species habitat likely to occur' category (Ref. 79); and the distribution mapping of the 'adult/juvenile sawfish known to occur' and 'pupping likely to occur' categories from Figure 1b of the Recovery Plan (Ref. 409).
Largetooth sawfish		×	May be present (based on species distribution mapping within the 'species or species habitat likely to occur' category (Ref. 79); however does not coincide with any distribution areas within Figure 1a of the Recovery Plan (Ref. 409).

5.3.3.4 Seabirds and shorebirds

Based on searches of the online PMST (Ref. 24; Appendix D), the threatened and/or migratory seabird and shorebird species shown in Table 5-14 may be present within the OA or Hydrocarbon EMBA. The full list of marine species identified from the PMST is provided in Appendix D. HCTS and BIAs associated with protected marine species are listed in Table 5-15 and Table 5-16.

[24] Although the PMST report (Appendix D) indicates the foraging BIA for whale shark overlaps with the OA, the PMST map viewer (figure attached in Appendix D), the AMSIS map viewer and the geospatial dataset from the DCCEEW do not show any overlap.

For the threatened and/or migratory species with BIAs within the OA, additional information has been provided in the following subsections. Further details on other threatened and/or migratory species are included in the CAPL Planning Area Description of the Environment (Appendix G of the OSM-BIP [Ref. 5]).

Table 5-14: Presence of threatened and/or migratory seabirds and shorebirds

Common name	OA	Hydrocarbon EMBA
Abbott's Booby (*Endangered*)	×	✓
Asian Dowitcher (*Vulnerable, migratory*)	×	✓
Australian fairy tern (*Vulnerable*)	✓	✓
Australian painted snipe (*Endangered*)	×	✓
Barn swallow (*Migratory*)	×	✓
Bar-tailed godwit (*Migratory*)	×	✓
Bridled Tern (*Migratory*)	×	✓
Campbell albatross (*Vulnerable, migratory*)	×	✓
Caspian tern (*Migratory*)	×	✓
Common greenshank (*Endangered, Migratory*)	×	✓
Common noddy (*Migratory*)	✓	✓
Common sandpiper (*Migratory*)	✓	✓
Curlew sandpiper (*Critically endangered, migratory*)	✓	✓
Eastern curlew (*Critically endangered, migratory*)	✓	✓
Flesh-footed shearwater (*Migratory*)	×	✓
Fork-tailed swift (*Migratory*)	×	✓
Golden bosun (*Endangered*)	✓	✓
Great frigatebird (*Migratory*)	×	✓
Greater crested tern (*Migratory*)	×	✓
Greater sand plover (*Vulnerable, migratory*)	×	✓
Grey wagtail (*Migratory*)	×	✓
Indian yellow-nosed albatross (*Vulnerable, migratory*)	×	✓
Lesser frigatebird (*Migratory*)	✓	✓
Little tern (*Vulnerable, migratory*)	×	✓
Northern Siberian bar-tailed godwit (*Endangered*)	×	✓
Oriental plover (*Migratory*)	×	✓
Oriental pratincole (*Migratory*)	×	✓
Osprey (*Migratory*)	✓	✓
Pectoral sandpiper (*Migratory*)	✓	✓
Red knot (*Vulnerable, migratory*)	✓	✓
Red-tailed tropicbird (*Migratory*)	✓	✓
Red-tailed tropicbird (Indian Ocean) (*Endangered*)	✓	✓
Roseate tern (*Migratory*)	×	✓

Common name	OA	Hydrocarbon EMBA
Sharp-tailed sandpiper (*Vulnerable, migratory*)	✓	✓
Soft-plumaged petrel (*Vulnerable*)	×	✓
Southern giant petrel (*Endangered, migratory*)	✓	✓
Streaked shearwater (*Migratory*)	✓	✓
Wedge-tailed shearwater (*Migratory*)	×	✓
White-tailed tropicbird (*Migratory*)	✓	✓
Yellow wagtail (*Migratory*)	×	✓

Table 5-15: Presence of BIAs for seabirds and shorebirds

Common name	BIA behaviour	Seasonal presence	OA	Distance from the OA	Hydrocarbon EMBA
Fairy tern	Breeding	Breeding from July to late September	×	~66 km	✓
Lesser crested Tern	Breeding	Breeding March to June	×	~68 km	✓
Roseate tern	Breeding	Breeding from mid-March to July	×	~72 km	✓
Wedge-tailed shearwater	Breeding	Breeding visitor arriving in mid-August and leaving in April in Pilbara and mid-May in Shark Bay	✓	Intersects the OA	✓

Table 5-16: Presence of HCTS seabirds and shorebirds species

Common name	HCTS location	OA	Hydrocarbon EMBA
Australian fairy tern	Suitable habitat where the species is known or likely to breed or forage as shown in the indicative distribution map in Figure 1 of the National Recovery Plan (Ref. 496).	×	May be present (based on species distribution mapping for the 'species or species habitat known or likely to occur' category (Ref. 79; Ref. 496).
Australian painted snipe	Any natural wetland habitat where the species is known or likely to occur (especially with suitable breeding habitat) within the indicative distribution map in Figure 1 of the National Recovery Plan [Ref. 493])	×	May be present (based on species distribution mapping for the 'species or species habitat known or likely to occur' category (Ref. 79; Ref. 493).

5.3.3.4.1 Wedge-tailed shearwater

The wedge-tailed shearwater (*Ardenna pacifica*) is listed as migratory under the EPBC Act. A breeding BIA for the wedge-tailed shearwater intersects with the OA and Hydrocarbon EMBA (Figure 5-6). Breeding BIAs are based on a foraging buffer around breeding areas (e.g. islands that the species is known to nest on (Ref. 80). The wedge-tailed shearwater 'foraging in high numbers BIA' is much further south (>660 km from the OA), near Carnarvon.

Wedge-tailed shearwaters are a pelagic, migratory visitor to WA; estimates indicate more than one million shearwaters migrate to the Pilbara islands each year (Ref. 81) out of an estimated global population of five million (Ref. 82). The

wedge-tailed shearwaters typically begin arriving at their WA rookeries around August each year and excavate burrows on vegetated islands for nesting; peak egg laying typically occurs during November; and they typically leave nests in early-April to early-May and travel north to the Indian Ocean (Ref. 83; Ref. 84). Migration from the rookery is very synchronous, but the return is less so (Ref. 84). Breeding behaviours are nocturnal in wedge-tailed shearwaters. Adults return to and depart the rookery at night and fledglings depart at night. Adults may not return to feed chicks each night. In the lead up to fledging, chicks also leave their burrows to exercise their wings outside burrows. Once adults cease returning to feed their young, the young (fledgling) wedge-tailed shearwaters fledge and depart nests (Ref. 85; Ref. 86).

Known breeding[25] locations in the NWMR include Forestier Island (Sable Island), Bedout Island, Dampier Archipelago, Passage Island, Lowendal Island, islands off Barrow Island (Double and Boodie islands), islands in the Onslow area (including Airlie, Bessieres, Serrurier, North and South Muiron and Locker islands), islands in Freycinet Estuary, and south Shark Bay (Slope, Friday, Lefebre, Charlie, Freycinet, Double and Baudin islands) (Ref. 82). One of the closest rookeries to the OA is Double Island (east of Barrow Island). Baseline monitoring (pre-construction of the GFP) recorded ~20–50 wedge-tailed shearwater nesting burrows on North Double Island and ~300 on Double Island South (Ref. 87; Ref. 88). CAPL (Ref. 88; Ref. 89) estimated 500 burrows over a 2 ha portion of the north-eastern corner of Double Island South, supporting 5,000–10,000 pairs of wedge-tailed shearwaters.

When foraging, wedge-tailed shearwaters fly <10 m above the water, dive to depths around 2–3 m (Ref. 90). This species diet consists of squid, fish, and crustaceans (Ref. 82). This species is known to forage relatively close to breeding islands (Ref. 82); however, more recent studies have indicated bimodal foraging. A study on foraging behaviour of the wedge-tailed shearwaters during the 2018 nesting season on the Muiron Islands showed a bimodal foraging strategy that incorporated both short (<4 days) and long (>7 day) trips (Ref. 84). The foraging trips of the wedge-tailed shearwaters from the Muiron Islands were recorded over a large area, extending from the Cape Range Canyon to the Indonesian Archipelago; and a consistent pattern of foraging near seamounts was observed (Ref. 84). This area is also part of the foraging extent used by the wedge-tailed shearwaters from both Pelsaert and Houtman Abrolhos islands (Ref. 84; Ref. 91). The use of a bimodal foraging strategy suggests that prey availability close to the rookery (i.e. areas that would be utilised on short trips) are inadequate for the large numbers of breeding shearwaters (Ref. 84).

[25] Of these known breeding locations, Lowendal, Double, Boodie, Airlie, Bessieres, Serrurier, North and South Muiron, Locker islands occur in the Hydrocarbon EMBA.

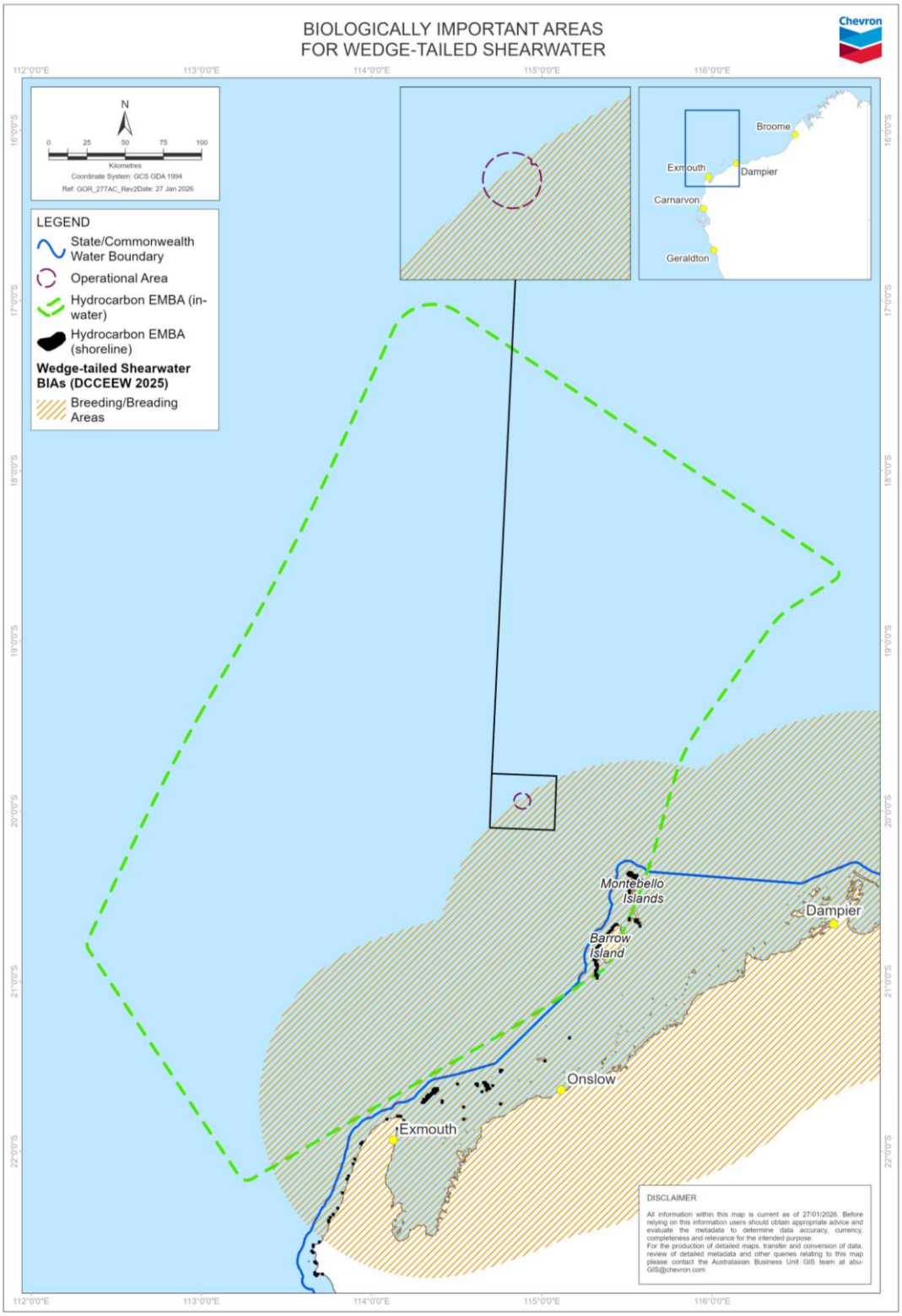


Figure 5-6. Biologically important areas for wedge-tailed shearwater

5.3.3.5 Summary of marine fauna seasonal sensitivities

Periods of the year coinciding with key biologically important behaviours for EPBC Act listed threatened and/or migratory species that may potentially be present within the OA are presented in Table 5-17.

Table 5-17: Seasonal presence of marine fauna with biologically important behaviours within the OA

Activity/Species	January	February	March	April	May	June	July	August	September	October	November	December
Petroleum activity												
G&E campaign												
IMR	(as required)											
Marine fauna with biologically important behaviour												
Pygmy blue whale northern migration[1]												
Pygmy blue whale southern migration[1]												
Pygmy blue whale opportunistic foraging[2]												
Wedge-tailed shearwater migration[3]												
Wedge-tailed shearwater breeding[4]												

	Indicative activity timing
	Species may be present and displaying biologically important behaviour in the region
	Predicted peak period
	Species presence detected during CAPL's soundscape monitoring

1. Pygmy blue whales presence during northern migrations along the WA coast have been detected between approximately January and August (Ref. 51; Ref. 54) and during southern migrations between November and January (Ref. 51; Ref. 54). Pygmy blue whale presence within the Jansz region has been recorded from late-March to mid-September (peak late-May to June) during northern migration, and from early-October to late-January (peak late-November and early-December) for the southern migration (Ref. 53).

2. Habitat suitability modelling indicates that foraging habitat may exist along the continental shelf break and slope in north-west WA (Ref. 60). Utilisation of the 'most important areas' for foraging for the pygmy blue whale were identified to be correlated to the species northern and southern migrations (Ref. 64).

3. Wedge-tailed shearwaters typically begin arriving at their WA colonies around August; and then leave nests in early-April to early-May (Ref. 83; Ref. 84). Once adults cease returning to feed their young, the young (fledging) wedge-tailed shearwaters fledge and depart nests (Ref. 85; Ref. 86).

4. Wedge-tailed shearwaters breed in the Pilbara region from November to April; peak egg laying typically occurs during November (Ref. 83; Ref. 84).

5.3.4 Marine environmental quality

The term ‘environmental quality’ refers to the level of contaminants, or changes to the physical or chemical properties relative to a natural state (Ref. 92).

5.3.4.1 Water quality

Water clarity on the NWS is variable according to movement, depth and sediment; however, nearshore waters in the NWS may have high turbidity due to local current-induced resuspension of fine sediments and episodic run-off from adjacent rivers (Ref. 93).

Wenziker et al. (Ref. 94) estimated natural background concentrations for potential contaminants in waters around the Dampier Archipelago, which provided baseline water quality information for the nearshore waters of the NWS. The survey identified low background concentrations of metals and organic chemicals, with localised elevations of some contaminants (metals) near coastal industrial centres and ports (e.g. Dampier). Except for a few select constituents, such as relatively high natural levels of cadmium, the concentrations of metals were low (Ref. 94). Baseline monitoring (pre-construction of the GFP, in the waters off the west coast of Barrow Island (~94 km south-east of the OA and, within the Hydrocarbon EMBA), turbidity and concentrations of suspended sediments were generally low (Ref. 43).

CAPL conducted surveys (Ref. 33) to characterise the marine environment as part of the Gorgon Backfill Fields Development OPP; these surveys included water quality data collection close to the proposed G&E DC location. Concentrations of hydrocarbons and metals in the G&E DC samples were compared against the Australian and New Zealand Guidelines (ANZG) default guideline values (DGVs) for 99% species protection (Ref. 96). Concentrations of metal and hydrocarbon (total recoverable hydrocarbons [TRH], benzene, toluene, ethylbenzene and xylenes [BTEX] and polycyclic aromatic hydrocarbons [PAH]), were mostly below laboratory limits of reporting (LoR) or, where applicable, below 99% species protection DGVs, which is typical of an undisturbed offshore tropical environment (Ref. 33). Concentrations of arsenic and barium were above the LoR for surface and near-seabed water samples; no 99% DGV has been established for these metals. Barium concentrations were notably higher (more than double) in the near seabed sample compared to the surface sample; this trend didn’t exist for other constituents (Ref. 33). Total dissolved solids (TDS) range from 38,050 mg/L at the seabed to 38,350 mg/L at the surface (Ref. 33). Nutrient levels were generally low; total phosphorus (TP) concentrations were 0.02–0.09 mg/kg, and total nitrogen (TN) was 0.25–0.70 mg/kg. TP and TN concentrations were higher in near-seabed samples compared to those from the surface samples (Ref. 33).

Water temperature and salinity

Waters in north-west WA are tropical year-round, with sea surface temperature in open shelf waters reaching ~26°C in summer, and dropping to ~22°C in winter. Nearshore temperatures of north-west WA fluctuate through a higher temperature range from ~17°C in winter to ~31°C in summer (Ref. 89).

Baseline monitoring (pre-construction of the GFP) in the waters off west Barrow Island (~94 km south-east of the OA, within the Hydrocarbon EMBA) recorded salinity levels of 34.9–35.1 psu in both near-surface and near-seabed (Ref. 43). Within the nearshore waters of Barrow Island, temperature stratification is infrequent and there is little evidence of salinity stratification. However, rainfall

events are expected to cause localised salinity stratification in coastal waters adjacent to discharging watercourses (Ref. 97).

Salinity and temperature water column profiles were collected as part of Gorgon Backfill Fields Development surveys (Ref. 33), which included the proposed G&E DC location. Across the full survey area (i.e. all sites across the Development Area[26]. Temperatures in the top 50 m of water ranged from 27.7°C to 29.2°C, decreasing gradually with increasing depth, reaching a minimum of ~3.9–4.2°C in water depths of ~1,350 m (Ref. 33). Salinity was relatively consistent with depth, ranging from 32.3 psu to 36.3 psu. Conductivity showed a similar trend to temperature, in which conductivity ranged from 52.9 mS/cm to 57.4 mS/cm in the top 50 m of water, and gradually declined with depth, reaching a minimum of ~33.1 mS/cm at ~1,350 m depth (Ref. 33).

Temperature-salinity profiles were typical for the region (Ref. 33). Across the full survey area (the Development Area), three separate water masses within the water column were identified:

- low salinity surface water ranging from 34.6–35.3 psu with a temperature range of ~18–28°C; upper ~180 m of water column
- higher salinity mid-waters with a salinity and temperature range of 35.4–36 psu and 15–20°C, respectively; centred between 185 m and 250 m water depth
- lower salinity bottom waters with a salinity and temperature range of 34.7–35.4 psu and ~3.5–15°C, respectively; between 250 m to ~1,310 m water depth.

Water quality profiles indicate that surface waters correspond with the southward-flowing Leeuwin Current and the deeper south Indian central water mass along with the subsurface Leeuwin Undercurrent, which moves towards the equator along the WA coast at deeper depths (Ref. 33).

5.3.4.2 Sediment quality

Marine sediment quality within the OA and broader Hydrocarbon EMBA is generally expected to be representative of high-sediment quality typically found in offshore areas away from anthropogenic sources of contamination.

Previous sediment quality data for Pilbara coastal waters (Ref. 95) indicated no detectable hydrocarbons, and with metal concentrations typically below the relevant ISQG-low guidelines.

Sediment quality sampling during 2014 and 2015 off the east coast of Barrow Island showed that except for nickel in one reference site sample, total metal concentrations of all sediment samples were below respective laboratory LoR and/or Interim Sediment Quality Guideline (ISQG)-Low trigger values (Ref. 97). Sediment tributyltin (TBT) concentrations were all below the laboratory LoR and the ISQG-Low trigger value, except for one sample in each of the 2014 and 2015 surveys (Ref. 97). Total petroleum hydrocarbons (TPH) and total polycylic aromatic hydrocarbon (PAH) concentrations were all below the LoR in 2014 and at very low concentrations in 2015 samples (with a much lower LoR). Once normalised for (very low) organic carbon content, six samples from 2015 were

[26] This is Development Area for the Backfill Fields Development as defined within Section 4.1.3 of the OPP (Ref. 3).

above ISQG-Low concentrations for benzo(a)pyrene, but well below the ISQG-High concentrations (Ref. 97).

Sediment quality samples were collected as part of Gorgon Backfill Fields Development surveys (Ref. 33), which included the proposed G&E DC location. The concentrations of hydrocarbons (TRH, BTEX, and PAH), were all below the LoR. Concentrations of metals and metalloids were below ANZG DGVs (where they are established). Given that this was a baseline study and no previous petroleum activity has occurred in the vicinity of the G&E DC, it is expected that this sediment chemistry would be representative of natural background levels within the OA.

Particle size

Sediment samples collected from the proposed G&E DC location were predominantly composed of fine particles, with ~45% clay (<2 µm) and ~50% silt (2–60 µm), and minor (~5%) proportion of sands (0.06–2 mm) (Ref. 33).

5.3.4.3 Air quality

Air quality within the OA and Hydrocarbon EMBA is expected to be representative of the typically high air quality found in offshore areas, away from industrial point sources.

For the 2020–2025 reporting period , the Ambient Air Quality Monitoring Program on Barrow Island indicated there were no exceedances for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), or carbon monoxide (CO) against the relevant National Environment Protection Measure (NEPM) guidelines (Ref. 103). There have been exceedances of PM_{10} and ozone (O_3) above NEPM guidelines, around facilities on Barrow Island; however, these are likely associated with vehicle traffic and/or regional weather events (Ref. 103).

It is expected that these low levels of contamination would continue throughout the OA and Hydrocarbon EMBA, unless within the immediate vicinity of an offshore point source such as a vessel or offshore petroleum activity where presence of atmospheric emissions would be slightly elevated.

5.3.5 People and communities

People and communities, and specifically their social, economic, and cultural features, are included within the definition of environment within the OPGGS(E)R. People and communities have been identified and described to the extent that they directly affect, or are affected by the existing physical and biological environments within the OA and Hydrocarbon EMBA.

The NWMR supports a range of economic, social, and cultural activities. At present, industries within the NWMR include petroleum exploration and production, commercial and recreational fishing, tourism, ports and shipping (Ref. 26). These uses of the NWMR make an important economic and social contribution to settlements along the coast (Ref. 26). Industry activities present within the OA and Hydrocarbon EMBA are identified and described in Section 5.4.

5.3.5.1 Land use

The OA occurs offshore and does not have any interface with the coast. The Hydrocarbon EMBA interfaces with the coast, including parts of Barrow Island, the Montebello Islands, other Pilbara inshore islands, as well as some parts of the

mainland coast along the North West Cape (Figure 5-1). Note: The Hydrocarbon EMBA typically only extends landward to the high-water mark (HWM).

The land uses that may be present within the Hydrocarbon EMBA (shoreline) are summarised below.

The Montebello Islands are designated as a State Conservation Park (International Union for Conservation of Nature [IUCN] II) (Section 5.5.3), and are surrounded by the State Montebello Islands Marine Park (IUCN II) (Section 5.5.2) and Commonwealth Montebello Marine Park (Section 5.5.1). The Conservation Park is gazetted to the HWM. Given the natural values of the islands and surrounding waters, recreational activities may occur. Shore-based fishing, beach walks, picnics and wildlife viewing are types of activities that may occur (Ref. 98). Camping is permitted on some of the islands (with some restrictions during turtle nesting season) (Ref. 98; Ref. 99).

Barrow, Double, Middle, and Boodie islands are designated as State Nature Reserves (IUCN Ia) (Section 5.5.3) and are surrounded by the Barrow Island Marine Park (IUCN Ia) and Barrow Island Marine Management Area (IUCN VI) (Section 5.5.2). The Nature Reserves are gazetted to the low-water mark (LWM). Access to Barrow, Double, Middle, and Boodie Islands is not encouraged due to numerous natural and man-made hazards, including the operation of the Gorgon Gas Development (Ref. 98). Camping is not permitted on any of these islands (Ref. 98).

The Pilbara Inshore Islands are a group of over 170 islands, islets, rocks and cays that lie between the bottom of Exmouth Gulf and the Regnard Islands near Cape Preston (Ref. 98). Some of the islands that occur within the Hydrocarbon EMBA are classified as Nature Reserves (IUCN Ia) (Section 5.5.3). The islands are gazetted to a mixture of either LWM and HWM. The Pilbara Inshore Islands Nature Reserves are known as important breeding and resting places for migratory and resident shorebirds, seabirds and marine turtles (Ref. 98). Fishing, beach walks and wildlife viewing are types of activities that may occur in the Pilbara Inshore Islands Nature Reserves (Ref. 98). Camping is only permitted on certain islands and may require a permit (Ref. 98).

The Cape Range National Park (IUCN II) and Bundegi Coastal Park (IUCN) are protected under WA jurisdiction (Section 5.5.3), and they are part of the Ningaloo Coast World Heritage Area. Both terrestrial protected areas are gazetted to the HWM. Given the natural values of the parks and surrounding waters, recreational activities may occur. Walk trails, wildlife viewing, camping, beachcombing, swimming, snorkelling, beach fishing are types of activities that may occur (Ref. 100; Ref. 101).

One Native Title determination (WCD2019/016) extend into the Hydrocarbon EMBA (Section 5.6). The determination areas contain places of cultural significance, such as spiritual and ceremonial sites and natural resources (Ref. 102).

There are no towns or cities located within the Hydrocarbon EMBA.

5.3.5.2 Heritage

Australia’s heritage includes places, values, traditions, events and experiences that capture where we have come from, where we are now and gives context to where we are headed as a community (Ref. 104).

Where known heritage sites and/or artefacts are formally protected under specific heritage legislation, these are described within Section 5.6. The following sections summarise other known heritage values identified within the OA and Hydrocarbon EMBA.

5.3.5.2.1 First Nations cultural activities, connections, and obligations

First Nations People have an ongoing cultural and spiritual connection to the Sea Country, as well as and islands within the Hydrocarbon EMBA, and the adjacent land areas, which includes an obligation to protect cultural values and features such as songlines, dreaming stories, and flora and fauna connected to them.

For First Nations People, every aspect of the land, sea and sky is infused with meaning and life, from the waterways that snake across the country to the rocks that rise up to meet the sky. The concept of 'Country' is holistic, encompassing all elements of the environment, and is central to their identity and sense of belonging. This deep connection is reflected in their languages, ceremonies, and customs, which are all rooted in the land, providing a sense of continuity and connection to their ancestral heritage. This brings with it, personal, cultural and spiritual obligations and responsibilities, such as an obligation to protect cultural heritage values, which is integral for their existence and wellbeing.

Cultural heritage values are not only comprised of tangible (archaeological) values; it also includes intangible (anthropological) values. Tangible values are those with physical aspects of Aboriginal cultural heritage that are visible, touchable, and measurable (such as stone artefacts, shelters, middens, and art). While intangible values refer to the non-physical aspects of Aboriginal cultural heritage that are transmitted, shared and expressed through language, stories, ceremonies, rituals, and practices (such as songlines, sacred sites, and kinship).

Sea Country is a concept that encompasses the marine environments, coastal areas, and the cultural landscapes that are deeply connected to Aboriginal peoples. Like the concept of ‘Country’, Sea Country is not just a source of food and resources but a living entity that holds stories, spirits, songlines and ancestral connections.

Songlines are paths that track across Country and skies, representing First Nations knowledge, linking people, places, and practices (Ref. 105). They are not only a means of cultural expression but also serve as a guide for navigating and understanding the natural world, woven into song, dance, and memory. These songlines are the living tools that embed and mediate history, ecological knowledge, relationships ancestral beings, and cultural belonging on Country (Ref. 106), guiding not just movement, but culture, lore, and identity. Kearney et al. (Ref. 107) describe that for saltwater peoples “stories and songlines locate, interpret and inscribe knowledges of both the Dreaming tracks, bodies and movements of ancestral beings that criss-cross over Sea Country and the permanent sites of ancestral inhabitation within the marine environment”. Songlines rely on the continued health of Country, and people’s continued access and connection to it (Ref. 108). When Country is damaged or altered, so too are songlines and the knowledge they embody and enact (Ref. 106).

Nunn and Reid (Ref. 109) discuss how First Nations oral traditions have documented sea level rise over the last 7,000 years. Kearney et al. (Ref. 107) also discusses how seabed mapping near Murujuga (Burrup Peninsula) identified two submerged waterholes that were identified by local senior elders as belonging to the Kangaroo songline. A song line from the mainland to Barrow Island has been referenced during surveys involving Thalanyji knowledge holders (Ref. 110).

Underwater cultural heritage (UCH), including First Nations UCH, as protected under the UCH Act is discussed in Section 5.6.2.

First Nations People have a profound understanding of the marine ecosystems, developed over thousands of years through observation and interaction which is not merely scientific but deeply intertwined with their cultural practices and beliefs. This knowledge includes seasonal patterns, breeding cycles of marine life, and the sustainable harvesting of resources. This holistic understanding allows them to manage and utilise marine resources in a way that ensures sustainability and respects the natural balance. Supporting First Nations people to engage in a diverse range of marine resource use activities that are sustainable and support to provide for their families and communities (such as hunting, egg collecting, fishing and gathering shellfish).

This deep spiritual connection to marine life is also reflected in their customs, beliefs, and traditions as some marine species hold totemic and kinship significance, and are woven into Dreaming, songlines, and stories. For example, some First Nations People have a strong connection to whales, which has significance as totemic ancestors to some groups (Ref. 111). The arrival of whales along Australia's coast marked the arrival of the "elders of the sea", which follows a songline that traces the journeys of ancestral spirits as they created the land, animals, and lore (Ref. 111).

First Nations People in northwest WA continue to rely on coastal and marine environments and resources of the region for their cultural identity, health and wellbeing, and their domestic and commercial economies (Ref. 112). For coastal First Nations People, it also remains a vital part of their lore and governance, as they have responsibilities as the Traditional Custodians to care for and protect their Sea Country to ensure that it remains healthy and productive for future generations. This stewardship is often guided by principles of reciprocity and respect, where the well-being of the sea is directly linked to the well-being of the people. Their commitment to protecting their Sea Country is demonstrated through their native title claims and their many initiatives to regain their role as managers of the cultural and natural values of north-west WA (Ref. 112).

Based on previous engagements with First Nations groups, CAPL understands that Thalanyji, Nhuwala, Mardathoonera, Yaburara, and Baiyungu people have connections to the Sea Country and/or islands within the Hydrocarbon EMBA and adjacent land areas. Previous consultation with these groups has confirmed that Sea Country is a significant cultural value which comes with cultural obligations. These Sea Country values include coastal and marine areas, offshore islands, marine fauna, and traditional stories (Table 5-18).

Table 5-18: Cultural values or features identified through consultation

Source	Cultural value or feature
Buurabalayji Thalanyji Aboriginal Corporation (BTAC)	The Thalanyji people have a deep connection to Sea Country north of Onslow, extending out into the islands off the coast of the Pilbara including: • Montebello Islands • Barrow Island • Mackerel Islands • Direction Island^ • Airlie Island • Weld Island^

Source	Cultural value or feature
	• North and South Islands^ • Ashburton Island^ • Twin Islands^ • any island or atoll proximate to the above islands • a general radius of 150 km from Onslow.
Mardathoonera Cultural Heritage Pty Ltd (MCH)	Cultural heritage values and features identified through consultation were requested to be treated as confidential. As such, heritage values and features identified by MCH have been captured in the sensitive information report provided separately to NOPSEMA
Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC)	No specific areas have been identified through consultation however NTGAC has noted the cultural importance of Sea Country to the Baiyungu people and the need to ensure it is protected in addition, CAPL understands the Ningaloo Coast is culturally significant to the Baiyungu people
Nhuwala Claim Group	Cultural heritage values and features identified through consultation were requested to be treated as confidential. As such, heritage values and features identified by Nhuwala Claim Group have been captured in the sensitive information report provided separately to NOPSEMA.
Wirrawandi Aboriginal Corporation (WAC)	The coastal area, Sea Country, and adjacent islands are highly valuable to the Yaburara and Mardudhunera people A connection to Barrow Island has also been identified.

^ *Direction Island, Weld Island, North and South Islands, Ashburton Island, and Twin Islands are located outside the Hydrocarbon EMBA for this EP (~41 km, ~54 km, ~47 km, ~52 km, ~36 km, ~44 km respectively).*

5.3.5.2.2 Historic heritage

Early European exploration of the NWMR and adjacent coast occurred in the 1600s; however, it was concluded at the time that resources and conditions were not appropriate for settlement (Ref. 26). British colonisation didn't begin in the Pilbara until the 1860s; pastoralism was the first major industry, followed by small ports and service centres (Ref. 26). The pearling industry began in the late-1800s, and remains a significant contributor to the economy of northwest WA (Ref. 26). Similarly, small fishing fleets were common from the 1860s onwards, and the commercial fishing industry also remains a significant economic input for northwest WA, particularly from prawn and demersal finfish fisheries (Ref. 26). Petroleum discovery and development commenced from the 1950s, with both onshore and offshore discoveries (Ref. 26).

The marine and coastal industries that still exist and operate within the NWMR are further described in Section 5.4.

5.3.6 Commonwealth marine areas

The Commonwealth marine area is a MNES under the EPBC Act, and a relevant value and sensitivity under the OPGGS(E)R. The OA and Hydrocarbon EMBA for this petroleum activity occurs within Commonwealth waters off WA that are part of the NWMR.

The NWMR comprises the Commonwealth waters and seabed from the WA—Northern Territory border south to Kalbarri (Ref. 26). The NWMR is characterised by shallow-water tropical marine ecosystems with high species richness. Most of the region's species are tropical and are also found in other parts of the Indian and western Pacific oceans (Ref. 26). The region is a tropical carbonate margin

that comprises an extensive area of shelf, slope, and abyssal plain/deep ocean floor, as well as complex areas of bathymetry such as plateau, terraces and major canyons (Ref. 28). The region experiences a tropical monsoonal climate towards the northern extent of the region, transitioning to tropical arid and subtropical arid within the central and southern areas of the region (Ref. 26).

Conservation values of the Commonwealth marine area include:

- protected species and/or their habitat (Section 5.3.3)
- protected places including Australian Marine Parks (AMPs, Section 5.5.1) and heritage places (Section 5.6)
- KEFs (Section 5.3.6.1).

5.3.6.1 Key ecological features

KEFs are elements of the Commonwealth marine environment that are considered to be of regional importance for a region's biodiversity or its ecosystem function and integrity. KEFs are not MNES and have no legal status in their own right; however, they are considered as components of the Commonwealth marine area.

KEFs meet one or more of these criteria (Ref. 113):

- a species, group of species, or a community with a regionally important ecological role (e.g. a predator, prey that affects a large biomass or number of other marine species)
- a species, group of species, or a community that is nationally or regionally important for biodiversity
- an area or habitat that is nationally or regionally important for:
  - enhanced or high productivity (such as predictable upwellings—an upwelling occurs when cold nutrient-rich waters from the bottom of the ocean rise to the surface)
  - aggregations of marine life (such as feeding, resting, breeding or nursery areas)
  - biodiversity and endemism (species that only occur in a specific area)
- a unique sea floor feature, with known or presumed ecological properties of regional significance.

The Australian Government has identified KEFs based on scientific advice about ecological processes and characteristics of the area (Ref. 113).

The presence of KEFs within the OA and Hydrocarbon EMBA are shown in Figure 5-7, and a description of the KEFs values and characteristics is provided in Table 5-19. No KEFs were identified within the OA; the closest is the continental slope demersal fish communities KEF, located ~12 km south-east of the OA.

Table 5-19: Values and characteristics of KEFs

KEF	OA	Distance from the OA	Hydrocarbon EMBA
Ancient coastline at 125 m depth contour[27]	✖	**~25 km**	✓
Parts of the Ancient coastline, particularly rocky escarpments, are thought to provide biologically important habitats in areas otherwise dominated by soft sediments. The topographic complexity of these escarpments may also facilitate vertical mixing of the water column, providing relatively nutrient-rich local environments (Ref. 26). The ancient, submerged coastline provides areas of hard substrate and therefore may provide sites for higher diversity and enhanced species richness relative to surrounding areas of predominantly soft sediment. According to the *Marine bioregional plan for the North-west Marine Region* (Ref. 26), little is known about fauna associated with the hard substrate of the escarpment across the entire KEF, but it is likely to include sponges, corals, crinoids, molluscs, echinoderms and other benthic invertebrates representative of hard substrate fauna in the NWS. **Values:** Unique sea floor feature with ecological properties of regional significance (Ref. 26).			
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	✖	**~160 km**	✓
The canyons are associated with upwelling as they channel deep water from the Cuvier Abyssal Plain up onto the slope. This nutrient-rich water interacts with the Leeuwin Current at the canyon heads. Aggregations of whale sharks, manta rays, sea snakes, sharks, large predatory fish and seabirds are known to occur in this area (Ref. 26). The canyons on the slope of the Cuvier Abyssal Plain and Cape Range Peninsula are connected to the Commonwealth waters adjacent to Ningaloo Reef and may also have connections to Exmouth Plateau. The narrow shelf width (about 10 km) near the canyons facilitates nutrient upwelling. Thus, the canyons probably play a part in the enhanced productivity of the Ningaloo Reef system (Ref. 26). The canyons are also repositories for organic and inorganic particulate matter from the shelf and serve as conduits for its transfer from the surface and shelf to greater depths. The hard substrates of canyons provide habitat for deepwater snapper and other species (Ref. 30). **Values:** Unique sea floor features with ecological properties of regional significance.			
Commonwealth waters adjacent to Ningaloo reef	✖	**~198 km**	✓
The Commonwealth waters adjacent to Ningaloo reef include Ningaloo Marine Park (Commonwealth waters) and encompass an area of 2,435 km^2. This feature lies adjacent to the Ningaloo Reef state water margin at the 3 nm limit. Ningaloo Reef is globally significant as the only extensive coral reef in the world that fringes the west coast of a continent. Upwellings associated with canyons on the adjacent slope and interactions between the Ningaloo and Leeuwin currents are thought to support the rich aggregations of large marine species present at Ningaloo Reef (Ref. 26). Aggregations of whale sharks, manta rays, humpback whales, sea snakes, sharks, large predatory fish and seabirds are known to occur in this area (Ref. 26). Detrital input from phytoplankton production in surface waters and from higher-trophic consumers cycles back to the deeper waters of the shelf and slope (Ref. 30). Deepwater biodiversity includes fish, molluscs, sponges, soft corals and gorgonians. Some of these sponge and filter-feeding communities appear to be significantly different to those of the Dampier Archipelago and Abrolhos Islands, indicating that the Commonwealth waters of Ningaloo Marine Park have some particular areas of potentially high and unique sponge biodiversity (Ref. 114). **Values:** High productivity and aggregations of marine life (Ref. 26).			

[27] Although the PMST report (Appendix D) indicates the ancient coastline at 125 m depth contour KEF overlaps with the OA, the PMST map viewer (figure attached in Appendix D), the AMSIS map viewer and the geospatial dataset from the DCCEEW do not show any overlap.

KEF	OA	Distance from the OA	Hydrocarbon EMBA
Continental slope demersal fish communities[28]	✖	**~12 km**	✓
The diversity of demersal fish assemblages on the Continental slope in the Timor Province, the Northwest Transition and the Northwest Province is high compared to elsewhere along the Continental slope. The Continental slope between North West Cape and the Montebello Trough has more than 500 fish species, 76 of which are endemic, which makes it the most diverse slope bioregion in Australia (Ref. 115). According to the *Marine bioregional plan for the North-west Marine Region* (Ref. 26), the demersal fish species occupy 2 distinct demersal community types associated with the upper slope (water depths: 225–500 m) and the mid-slope (750–1,000 m). Bacteria and fauna present on the continental slope are the basis of the food web for demersal fish and higher-order consumers in this system (Ref. 26). **Values:** High levels of endemism (Ref. 26).			
Exmouth Plateau	✖	**~58 km**	✓
The Exmouth Plateau is a regionally and nationally unique deep-sea plateau (water depths: 800–4,000 m) in tropical waters. The plateau is a very large topographic obstacle that may modify the flow of deep waters, generating internal tides and may contribute to upwelling of deeper-water nutrients closer to the surface, thus serving an important ecological role (Ref. 26). The topography of the plateau (with valleys and channels), in addition to potentially comprising a range of benthic environments, may provide conduits for moving sediment and other material from the plateau surface through the deeper slope to the abyss. The Exmouth Plateau is generally an area of low habitat heterogeneity; however, it is likely to be an important area of biodiversity as it provides an extended area offshore for communities adapted to water depths of ~1,000 m. Sediments on the plateau suggest that biological communities include scavengers, benthic filter feeders and epifauna (Ref. 26). Fauna in the pelagic waters above the plateau are likely to include small pelagic species and nekton (Ref. 30). **Values:** Unique sea floor feature with ecological properties of regional significance (Ref. 26).			

[28] Although the PMST report (Appendix D) indicates the continental slope demersal fish communities KEF overlaps with the OA, the PMST map viewer (figure attached in Appendix D), the AMSIS map viewer and the geospatial dataset from the DCCEEW do not show any overlap.

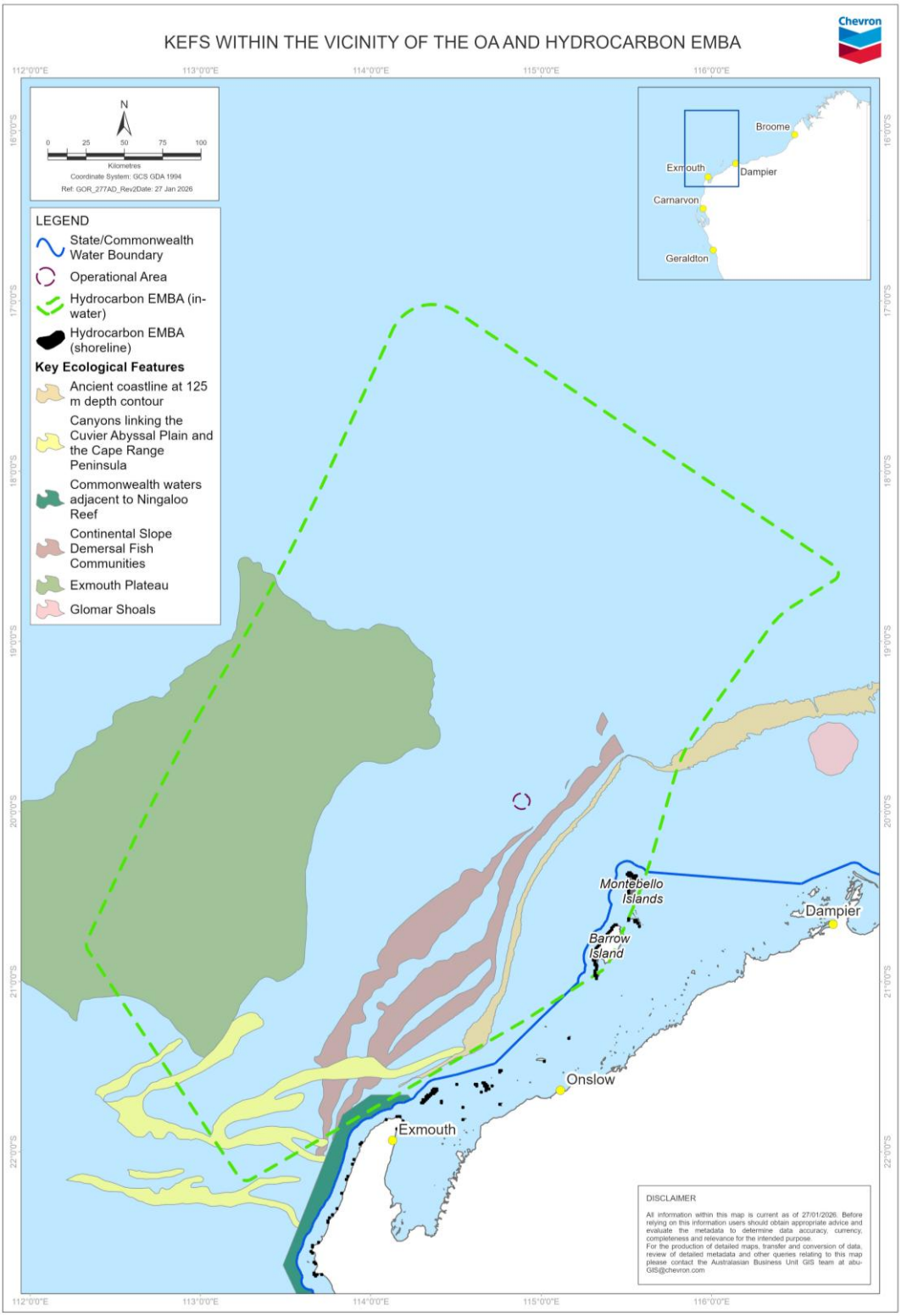


Figure 5-7. KEFs within the vicinity of the OA and Hydrocarbon EMBA

5.3.7 Commonwealth land area

Commonwealth land[29] is a relevant value and sensitivity under the OPGGS(E)R. Based on searches of the online PMST (Ref. 24; Appendix D) there is Commonwealth land associated with Department of Defence facilities that intersect with the Hydrocarbon EMBA. These facilities are further described in Section 5.4.7.

5.4 Natural and physical resources

Natural and physical resources are described as substances occurring in nature which can be exploited for economic gain, and may include resources such as fishing stocks, petroleum reservoirs, or values of the Commonwealth marine area. Marine and coastal industries have been developed based on natural and physical resources, and where these industries may intersect with the OA or Hydrocarbon EMBA they have been identified and described in the following sections.

5.4.1 Commercial fisheries

5.4.1.1 Commonwealth managed fisheries

The Commonwealth-managed commercial fisheries with fishing management areas that intersect the OA or Hydrocarbon EMBA, and that have fishing effort recorded over a 10-year period (2015–2024) (Ref. 116) are listed in Table 5-20.

Only one fishery, the North West Slope Trawl Fishery (NWSTF), with recorded fishing effort within the 60 nm graticular reporting block intersects with the OA.

Table 5-20: Presence of recent (2015-2024) fishing effort recorded within Commonwealth-managed commercial fisheries

Fishery	OA	Hydrocarbon EMBA
North-West Slope Trawl Fishery	✓	✓
Western Deepwater Trawl Fishery	×	✓
Western Tuna and Billfish Fishery	×	✓

North West Slope Trawl Fishery

The NWSTF uses bottom (or demersal) trawl gear methods to target deepwater prawn and scampi, typically in water depths of 350–600 m. The primary species landed in the NWSTF is the Australian scampi (*Metanephrops australiensis*), with smaller quantities of velvet scampi (*M. velutinus*), Boschma's scampi (*M. boschmai*) and mixed scampi (*Metanephrops spp. and Nephropsis spp.*) (Ref. 117). A quantity of prawns is typically harvested each season, and mixed squids can be significant component of the catch in some years. Finfish species are also taken in some years, with mixed snappers (*Lutjanidae*) and redspot emperor (*Lethrinus lentjan*) having an important component of the NWSTF catch at times (Ref. 117).

Fishing intensity data for the NWSTF is only available for the 2019–2020 reporting period and this data does not overlap the Hydrocarbon EMBA (Figure 5-8; Ref. 116). The OA only overlaps the recorded fishing effort for 2015. The

[29] Commonwealth land includes land owned or leased by the Commonwealth or a Commonwealth agency, land in the Jervis Bay Territory, land in the Christmas Island, Ashmore and Cartier Islands, Coral Sea Islands, Cocos (Keeling) Islands, Australian Antarctic territory and Heard and McDonald Islands external territories, and any other area of land that is included in a Commonwealth reserve.

Hydrocarbon EMBA overlaps multiple reporting grids with recorded fishing effort for the NWSTF (Figure 5-8; Ref. 116).

The total catch for the 2023-2024 season was 85.9 t (similar to the 85.3 t in the previous 2022-2023 season), with seven permits and three vessels operating over 232 days. Australian scampi made up ~65% of the total catch in 2023–24 season. According to the ABARES Fishery Status Report 2025, the NWSTF is not subject to overfishing (Ref. 117).

Tuna fisheries

While the OA and Hydrocarbon EMBA may occur within the broad management areas for some tuna-based fisheries (e.g. Southern Bluefin Tuna Fishery [SBTF], Western Tuna and Billfish Fishery [WTBF]), no fishing effort has been recorded within the vicinity of the OA and Hydrocarbon EMBA. The SBTF is active within waters in the Great Australian Bight and south-eastern Australia, and the WTBF is active off central and south-western WA.

A known spawning ground for southern bluefin tuna occurs in the Indian Ocean, between Java and northern WA (Ref. 117, Ref. 118). This spawning ground (based on geospatial data provided by ABARES, and as shown in annual Commonwealth fishery status reports) is outside of the OA (~1 km) but does extend into the Hydrocarbon EMBA. Spawning can take place from September to April (Ref. 119; Ref. 120), with two peaks observed in their spawning activity: September–October and February–March (Ref. 121; Ref. 122). Spawning typically occurs near the surface, after which adults regularly dive to deeper, cooler waters to thermoregulate, as they cannot tolerate warm surface temperatures for extended periods (Ref. 121). A female can release ~14 to 15 million eggs during a spawning period (Ref. 123). Individual fish probably stay in the spawning area for one month or so (Ref. 121; Ref. 124). Larvae drift passively and become entrained in the southward-flowing South Java and Leeuwin Currents, transporting them along the Western Australian coast (Ref. 121). During summer (December to April), juveniles tend to aggregate near the surface in coastal waters off southern Australia, before moving into deeper, temperate oceanic waters during winter (Ref. 119). One to two-year old juveniles then migrate either east to the Great Australian Bight, or west to the waters off South Africa (Ref. 122). After about five years of age, southern bluefin tuna are seldom found in nearshore surface waters, and their distribution extends over the southern circumpolar area throughout the Pacific, Indian and Atlantic Oceans (Ref. 119).

Known spawning grounds for yellowfin tuna generally occur in equatorial waters (~15 ºS –10ºN), with peak spawning typically occurring between November and April (Ref. 125 Ref. 126; Ref. 127). Recent habitat suitability modelling (Ref. 120) identified high-probability areas of larval occurrence for yellowfin tuna, was concentrated across the Indo-Pacific, particularly Northwestern Pacific in boreal spring/summer, and east of Papua New Guinea and north-west of Australia in austral spring/summer. In northwestern Australia during austral spring/summer, spawning hotspots were often co-located across pelagic fish species, including several tuna (skipjack, yellowfin, bigeye, and southern bluefin) (Ref. 120). Yellowfin tuna are multiple batch spawners, releasing batches of eggs multiple times throughout the spawning period (e.g. ~6—7 batches of eggs per spawning season within the western Indian Ocean), with spawning generally occurring at night (Ref. 126). As adults, yellowfin tuna can undertake extensive migrations between spawning areas in equatorial waters and feeding grounds in southern and northern latitudes (Ref. 128 cited in Ref. 127).

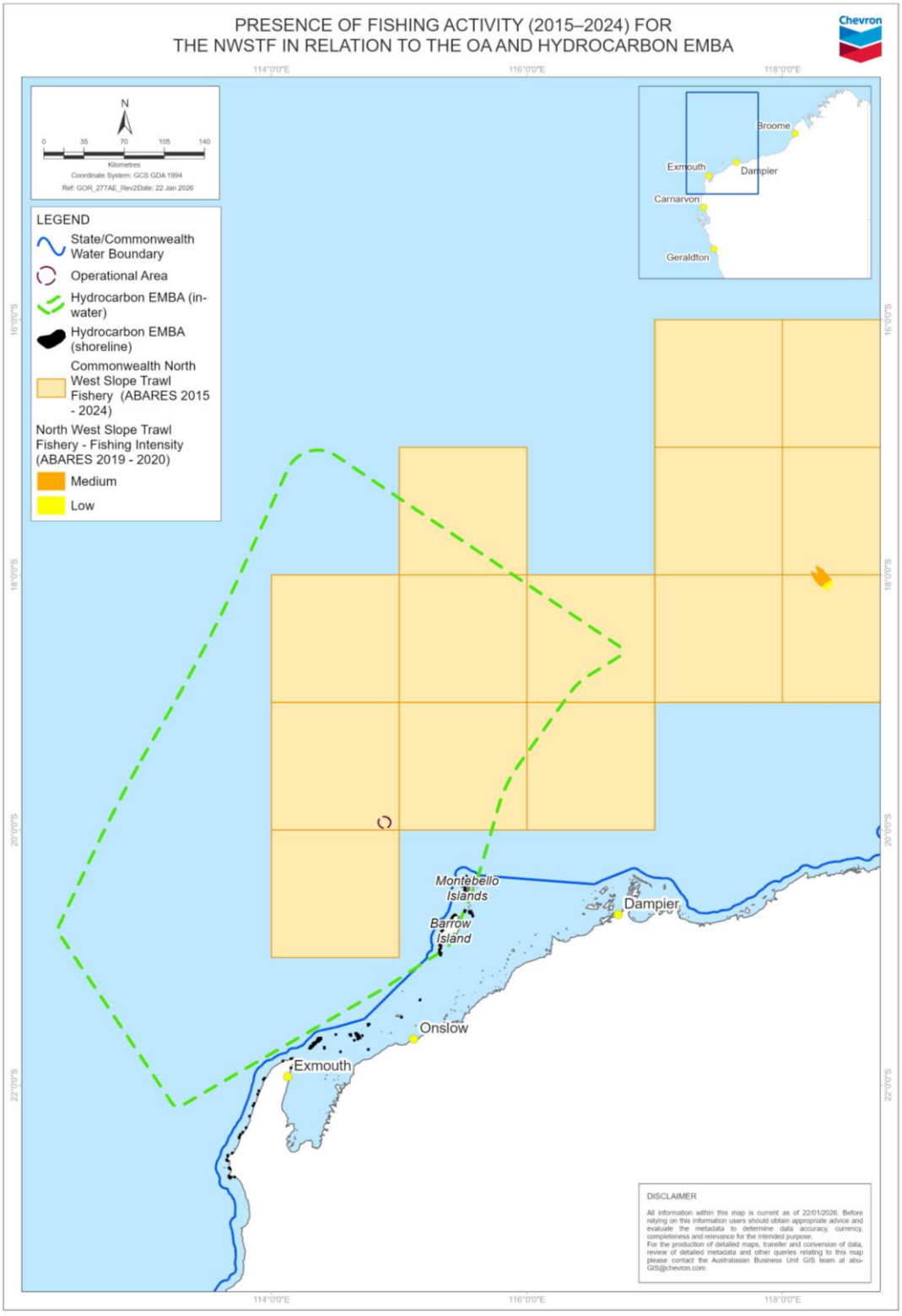


Figure 5-8: Presence of fishing activity (2015–2024) for the NWSTF in relation to the OA and Hydrocarbon EMBA

5.4.1.2 State managed fisheries

The State-managed commercial fisheries with fishery management areas that intersect the OA and Hydrocarbon EMBA, and that have fishing effort recorded over a 10-year period (2015–2024) (Ref. 129) are listed in Table 5-21.

For the fisheries with fishing effort recorded within the OA, additional information has been provided below.

Table 5-21: Presence of fishing effort recorded during 2015-2024 within State-managed commercial fisheries

Fishery	OA	Hydrocarbon EMBA
North Coast Bioregion		
Mackerel Managed Fishery	×	✓
Onslow Prawn Managed Fishery	×	✓
Pilbara Crab Managed Fishery	×	✓
Pilbara Line Fishery	✓	✓
Pilbara Trap Managed Fishery	×	✓
West Australian Sea Cucumber (Beche-De-Mer) Fishery	×	✓
Gascoyne Bioregion		
Exmouth Gulf Prawn Managed Fishery	×	✓
West Coast Deep Sea Crustacean Fishery	×	✓
Statewide		
Marine Aquarium Fish Managed Fishery	×	✓
Specimen Shell Managed Fishery	×	✓

Pilbara Line Fishery

The Pilbara Line Fishery (line fishing methods) operates on an exemption basis which restricts vessels to operating within a nominated 5-month block period each year (Ref. 130), typically May to September. The Pilbara Line Fishery catch is made up around 45–50 different fish species. The main species targeted by the fishery are bluespotted emperor (*Lethrinus punctulatus*), red emperor (*Lutjanus sebae*) and rankin cod (*Epinephelus multinotatus*), as well as some deeper offshore species such as ruby snapper and eightbar grouper. The total catch for the fishery in 2023 was 114 t (Ref. 131). According to the fishing effort records from Department of Primary Industries and Regional Development (DPIRD, Ref. 129), fishing effort activity within the 60 nm graticular reporting block that intersects with the OA was only recorded in 2015 and 2016, limited to three months across those years, with <3 vessels operating.

This fishery is part of the broader Pilbara Demersal Scalefish Fishery. For the 2023 fishing year, the bulk of the catch within the Pilbara Demersal Scalefish Fishery was landed by the trawl and trap sectors (which do not occur within the OA); with a smaller contribution (4%) from the line sector (Ref. 131). Note: Under the WA demersal fishing reforms there is a 50% catch reduction of commercial fisheries in-effect (from 1 January 2026) and permanent closure of trawl fishing for demersal scalefish in the Pilbara.

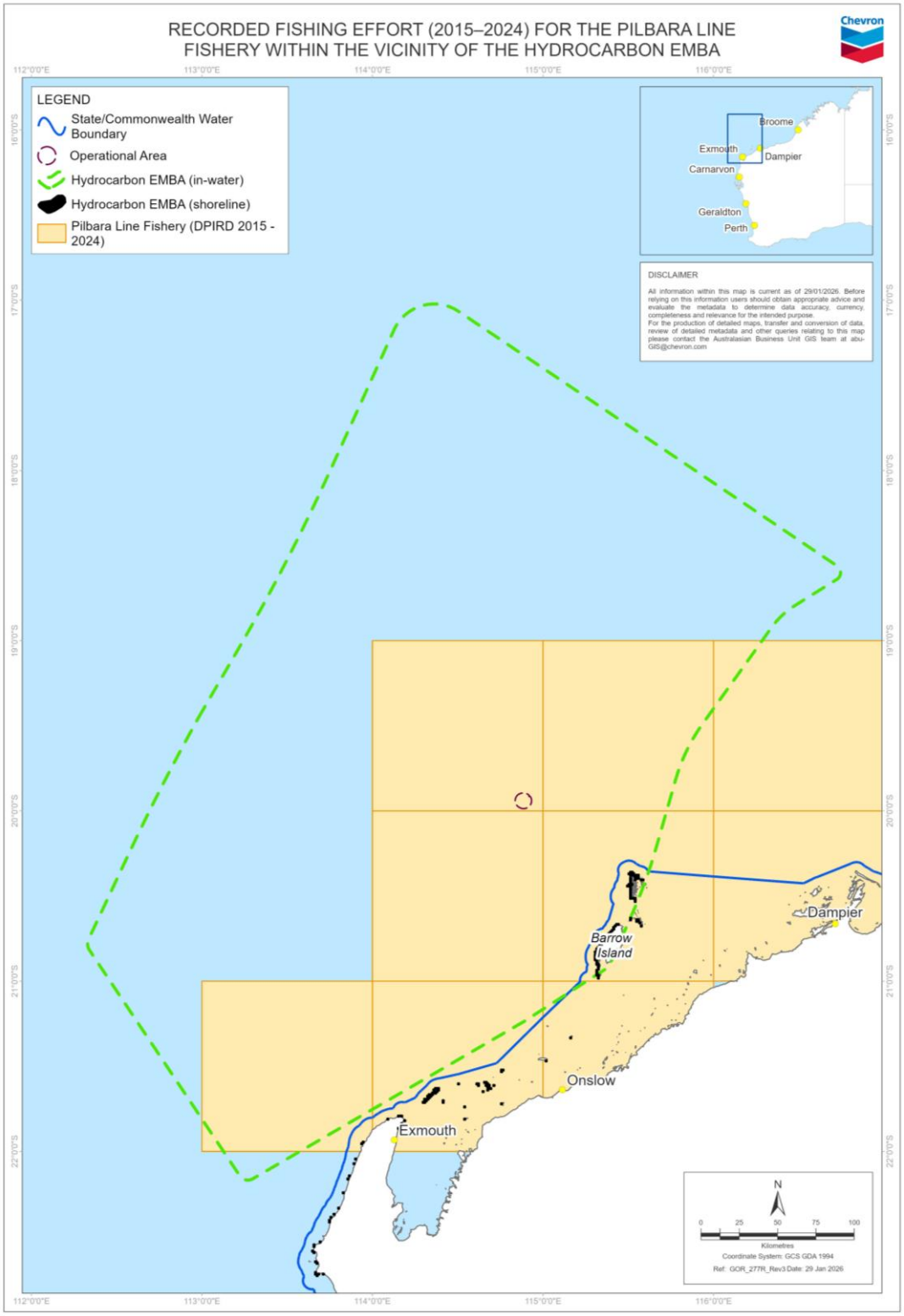


Figure 5-9: Recorded fishing effort (2015–2024) for the Pilbara Line Fishery within the vicinity of the OA and Hydrocarbon EMBA

5.4.1.3 Pearling and aquaculture

Pearling and aquaculture operations in north-west WA are typically restricted to inland and shallow coastal waters.

The OA occurs offshore and does not have any interface with the coast or shallow coastal waters, and therefore there is no overlap with any known licenced aquaculture or pearling operations.

The Hydrocarbon EMBA interfaces with the coast, including parts of Barrow Island, the Montebello Islands, other Pilbara inshore islands, as well as some parts of the mainland coast along the North West Cape (Figure 5-1). There are known pearl farm leases in nearshore waters around the Montebello Islands and one pearl approved site close to the North Muiron Island.

5.4.2 Recreational fisheries

Recreational fishing is one of the most popular activities in WA with around 753,000 people fishing recreationally during 2023–2024 (Ref. 132; Ref. 133). The WA DPIRD conducts state-wide boat-based recreational fishing surveys every two to three years, with the first survey completed in 2011–2012.

The 2023–2024 survey report (Ref. 133) identified that most boat-based State-wide recreational fishing effort occurred within the West Coast bioregion (68% boat days), followed by the North Coast (13%), Gascoyne Coast (12%) and South Coast (7%) bioregions. The OA and Hydrocarbon EMBA are within the North Coast bioregion, and the Hydrocarbon EMBA also extends into the Gascoyne bioregion. Within the North Coast bioregion most boat-based regional fishing occurs in nearshore habitat (53%), followed by inshore demersal (25%) and estuarine (13%), with lower proportions in pelagic (5%), offshore demersal (2%) and freshwater (2%) habitats[30] (Ref. 133). Within the Gascoyne most boat-based recreational fishing effort occurred in nearshore (57%) and inshore demersal (32%) habitats, with lower proportions in pelagic (7%) and offshore demersal (4%) habitats (Ref. 133). Fishing effort in the North Coast bioregion was highest in winter (40%), followed by spring (28%) and autumn (24%), while in the Gascoyne Coast bioregion it was highest during autumn (40%), then winter (33%) and spring (18%). Given the location and water depths of the OA and Hydrocarbon EMBA, high levels of recreational boat-based fishing is not expected to occur.

Tour operator fishing efforts recorded over a 10-year period (2015–2024) (Ref. 129) did not identify activity within the OA. Some shore-based fishing may occur in the coastal regions within the Hydrocarbon EMBA (Section 5.3.5.1).

5.4.3 Traditional fisheries

According to the Act, customary fishing means fishing by an Aboriginal person that (a) is in accordance with the Aboriginal customary law and tradition of the area being fished; and (b) is for the purpose of satisfying personal, domestic, ceremonial, educational or non-commercial communal needs. Customary fishing includes fish and does not apply to other species of marine fauna (e.g. crocodile, turtle, or dugong).

Under amendments made in 2012 to the Con*servation and Land Management Act 1984* (WA) Aboriginal people can undertake customary activities which includes

[30] Bioregions are divided into five depth-based habitats for fisheries management: pelagic (across all depths), offshore demersal (>250 m), inshore demersal (20–250 m), nearshore (to 20 m deep), estuarine (saltwater and 'brackish' to river mouth), and freshwater (river, stream, dams) (Ref. 133)

hunting (except in marine sanctuary zones or marine nature reserves) for dugong, turtle, or crocodiles in WA.

Ongoing use of marine and coastal resources, including customary fishing, is expected to occur in NWMR and adjacent coastal waters. However, it is expected that much of this activity will occur within shallow coastal waters and therefore would not intersect with the OA. Where shore-based fishing is undertaken, this may intersect with the Hydrocarbon EMBA.

The Hydrocarbon EMBA does not intersect with the Memorandum of Understanding (MoU) Box that allows for traditional Indonesian fishers within Australian waters. The MoU Box is managed via a bilateral agreement between Australian and Indonesian governments.

5.4.4 Commercial shipping

AMSA collects vessel traffic data from a variety of sources, including satellite shipborne automated identification system data, across Australia's Search and Rescue region. This data has been used to develop Figure 5-10, which shows vessel traffic within the vicinity of the OA and Hydrocarbon EMBA.

AMSA has established a network of shipping fairways off the north-west coast of Australia (Ref. 135). These fairways were intended to direct large vessels trading to the major ports into pre-defined routes; however, the use of these fairways is not mandatory, and do not grant users any special right-of-way. The OA is located to the south-east of the nearest NWS shipping fairway (Figure 5-10).

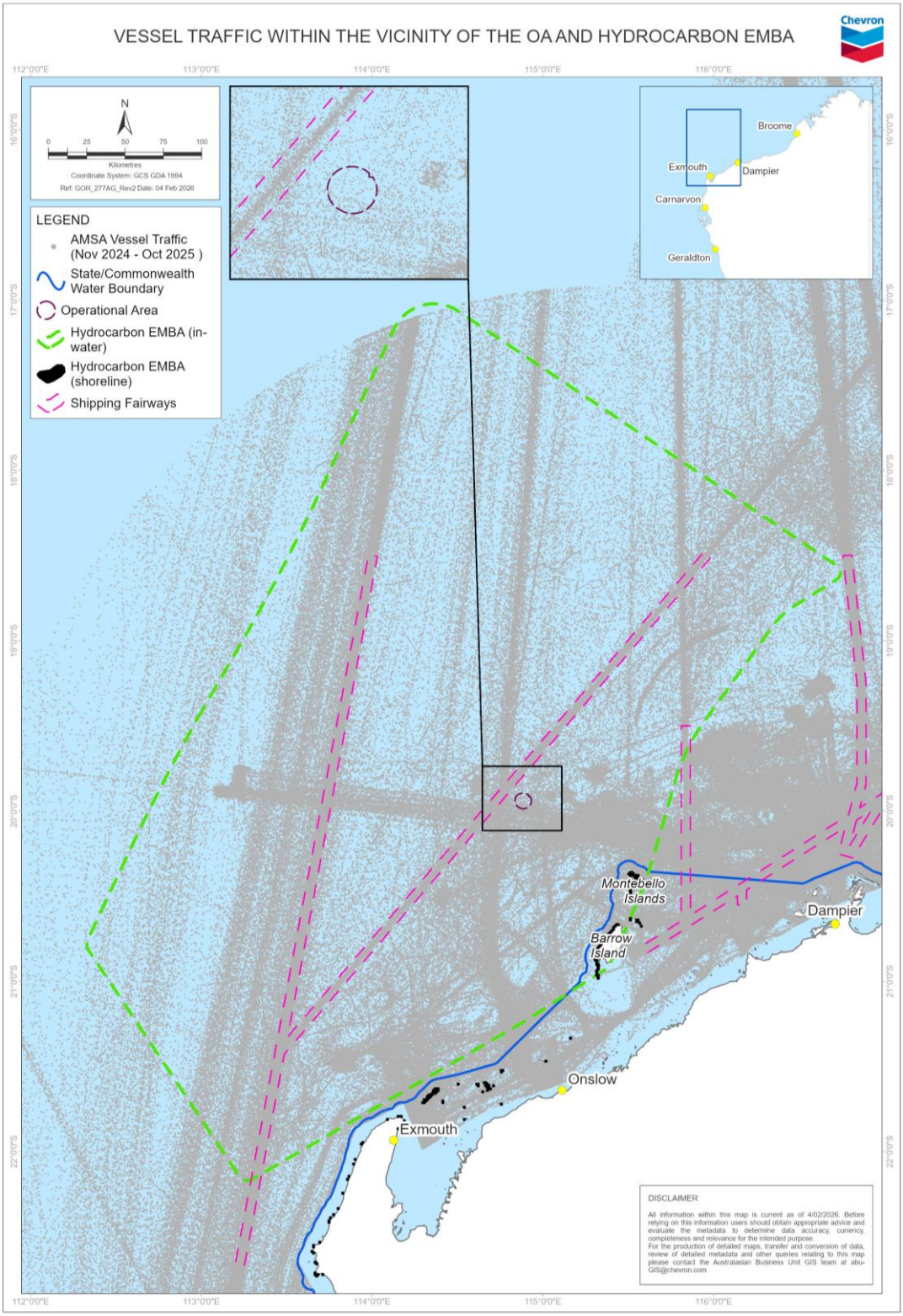


Figure 5-10. Vessel traffic within the vicinity of the OA and Hydrocarbon EMBA

5.4.5 Tourism and recreation

Tourism is an important industry for WA, directly employing 72,700 people and indirectly employing a further 47,400 in 2023–2024 (Ref. 134). Charter fishing, diving, snorkelling, wildlife watching, and cruising are some of the commercial tourism activities in and adjacent to the NWMR (Ref. 26). With the exception of some offshore recreational fishing (Section 5.4.2), most marine tourism and recreational activities occur in the shallower State waters (Ref. 26).

The OA occurs offshore and does not have any interface with nearshore waters or the coast, and as such limited tourism and recreational activities are expected (Section 5.4.2). The Hydrocarbon EMBA interfaces with the coast, including parts of Barrow Island, the Montebello Islands, other Pilbara inshore islands, as well as some parts of the mainland coast along the North West Cape (Figure 5-1). As described in Section 5.3.5.1, tourism and recreational activities may occur around these places.

The Gascoyne and Pilbara regions are popular visitor destinations for both Australian and international tourists. The main marine nature-based tourist activities within the Gascoyne Region are concentrated around and within the Ningaloo Coast World Heritage property (~180 km south-west of the OA; Section 5.6). Activities undertaken include recreational fishing, snorkeling and scuba diving, wildlife watching and encounters (including whale sharks, manta rays, humpback whales and turtles) (Ref. 136), as well as beach access, surfing and paddling sports. Recreational fishing within the Pilbara region tends to be concentrated in State waters adjacent to population centres. Charter vessels may also frequent the waters surrounding the Montebello Islands (Ref. 42).

5.4.6 Other petroleum activities

The OA is located within the Northern Carnarvon Basin. The Northern Carnarvon Basin is Australia’s premier hydrocarbon-producing province and contains an established network of oil, condensate and gas production infrastructure (Ref. 137) run by various operators. According to Australia's Energy Commodity Resources 2025 (Ref. 138), ~93% of conventional gas resources are located on the North West Shelf where gas is produced from the Northern Carnarvon, Browse, and Bonaparte basins.

The OA extends into two petroleum titles: WA-66-L and WA-15-R. No other petroleum activities have been identified within these petroleum titles.

In order to identify potential concurrent petroleum activities from CAPL or third-party operators, activities currently being assessed by NOPSEMA or accepted (but not yet conducted) were identified from the NOPSEMA website (Ref. 139). Those activities that may occur in the vicinity (≤20 km) of the OA[31] are described in Table 5-22. In addition to the EPs that have been accepted or are under assessment, CAPL is also proposing to undertake pipelay, subsea installation, and pre-commissioning activities for the GS3 Project; relevant person consultation for this petroleum activity has been undertaken (Ref. 140).

[31] Given that the largest predicted exposure area from planned activities under the scope of this EP (artificial light in Section 8.5) was predicted to be 14.3 km, a conservative 20 km buffer was applied for the review of concurrent petroleum activities. This buffer represents a conservative approach to assessing potential cumulative impacts.

Table 5-22: Petroleum activities within ~20 km from the OA

Operator and Environment Plan	Key characteristics of petroleum activity	Distance from the OA
Operations (Accepted EPs)		
CAPL – Gorgon and Jansz Feed Gas Pipeline and Wells Operations (Commonwealth Waters) EP	Activities include: • commissioning and start-up associated with the J-IC Project – commissioning is anticipated to commence from 2026, with start-up and operations from 2027 or 2028. Note: The infrastructure associated with J-IC commissioning and start-up activities under the EP is >20 km north-west from the OA. • ongoing operations of the GFP hydrocarbon system • IMR – if required, IMR activities would typically involve a single vessel for a duration of ~10-200 days, depending on the activity	~9 km (based on the potential for vessel-based IMR activities within parts of the Jansz pipeline licence; all other components of the GFP hydrocarbon system are >20 km from the OA)
CAPL – Wheatstone Project Start-Up and Operations EP	Activities include: • ongoing operations and IMR of the Wheatstone Platform and subsea hydrocarbon system. Note: The Wheatstone Platform, Wheatstone trunkline, and all subsea wells (including Wheatstone, Iago, Julimar, and Brunello fields) are >20 km from the OA	~18 km (based on the potential for vessel-based IMR activities associated with the Julimar wells)
Woodside – Scarborough Offshore Facility and Trunkline (Operations) EP	Activities include: • ongoing IMR, including for the Scarborough trunkline • all other Scarborough facilities are >100 km west from the OA and any activities have not been described	~10 km (based on the potential for vessel-based IMR activities within parts of the Scarborough pipeline licence)
Other (Accepted EPs)		
CAPL – Gorgon Gas Development Jansz Umbilical EP	Activities include: • installation, hook-up and contingency IMR of the Jansz umbilical – may occur between mid-2026 to mid-2028 for an estimated duration of ~3–6 months – Note: Most activities within scope of this EP are >20 km from the OA, including those within the Gorgon pipeline licence, along the umbilical route between Gorgon and Jansz, and most of the Jansz pipeline licence)	~9 km (based on vessel-based installation activities within parts of the Jansz pipeline licence)
CAPL – Gorgon Gas Development Pipeline and Subsea Infrastructure Installation and Pre-Commissioning EP	Activities include: • installation and pre-commissioning associated with the J-IC Project – most of infrastructure associated with J-IC is >20 km north-west from the OA, except for part of the high voltage submarine cable (HVSC) which runs broadly parallel to the Jansz Feed Gas Pipeline – indicative schedule for HVSC installation and hook-up is early-2026 to mid-2027	~7.5 km (based on vessel-based installation activities within parts of the Jansz pipeline licence)

Operator and Environment Plan	Key characteristics of petroleum activity	Distance from the OA
Woodside – Julimar-Brunello Plug and Abandonment	Activities include: • IMR and permanent plug and abandonment (P&A) of three wells (Julimar East-1, Brulimar-1, and Brunello 1 ST1) – Note: Only the OA for Julimar East-1 is within the 20 km buffer. Activities are planned to commence in March 2026 and expected to occur within a 3-year period • P&A: ~10-60 days per well • IMR: 1-7 days per well. The OA is defined by a 4 km radius around each well.	~18.5 km (based on activities with the Julimar East-1 OA)
EPs under assessment		
CAPL – Backfill fields Site investigation surveys	Activities include site investigation (geophysical, geotechnical, and environmental) surveys to support future development of Chrysaor and Dionysus (C&D) and Chandon gas fields. Note: Only part of the C&D OA is within the 20 km buffer. Activities are indicatively scheduled to commence from late-2026 / early-2027, with an estimate combined duration of ~4–6 months and may be undertaken as a single campaign or occur over multiple campaigns.	~7 km (based on activities within the C&D OA).
Woodside – Pluto 4D Monitor 3 Marine Seismic Survey (MSS)	Activities include MSS using an airgun array: • a seismic survey vessel supported by a support and chase vessels will undertake the activity. Activities are planned to be undertaken from late-December 2026 to February-2027 or late December-2027 to February-2028 (contingency): • the duration of the petroleum activity is expected within a window of ~40 days The Pluto 4D OA is located ~20 m east of the OA; however, the active source area (i.e. the area where the seismic source may be discharged) is >11 km east of the OA.	~20 m (potential for vessel presence) to >11 km (potential for active seismic source).

5.4.7 Other marine and coastal industries

Several other marine and coastal industries may be present within the OA and Hydrocarbon EMBA (Table 5-23; Figure 5-11). There were no offshore renewable energy facilities, salt mines, or onshore processing facilities identified within or adjacent to the Hydrocarbon EMBA.

Table 5-23: Presence of industries

Industry	OA	Hydrocarbon EMBA
Defence	✓	✓
Ports	×	✓
Submarine cable	×	✓

The Royal Australian Air Force have a base located at Learmonth, and there is a designated maritime firing practices and exercise area associated with this base (Ref. 141) which overlaps with the OA and Hydrocarbon EMBA. The Australian Navy has three communication stations located on the North West Cape

peninsula. The Harold E Holt Area A is located at the northern extent of the North West Cape, and includes a very low frequency radio, towers and associated infrastructure. Harold E Holt Area A also includes the Point Murat Navy Pier, and the waters extending 400 m around the pier (Ref. 142) There are no known sites of unexploded ordnance within the OA (Ref. 143).

Submarine telecommunications cables are underwater infrastructure linking Australia with other countries; the submarine communications cables carry the bulk of Australia's international voice and data traffic. One known submarine cable intersects with the Hydrocarbon EMBA: the Highclere Cable. This cable links the Australia Singapore Cable to the North-West Cable System; combined the three cables form the Darwin-Jakarta-Singapore Cable system. Under Part 2 of the *Telecommunications Act 1997* (Cth), the Australian Communications and Media Authority (ACMA) can declare protection zones covering the cables to prohibit and/or restrict activities that may damage them. The protection zones are generally the area within 1.85 km (1 nm) either side of the cable and include both the waters and seabed within the area. No protection zone has been declared for the Highclere Cable.

The *Port Authorities Act 1999* (WA) governs Western Australia's port authorities, covering their functions, responsibilities, concept of operations and related matters. The Port of Ashburton and Port of Varanus Island are both proclaimed ports managed under this Act, and the port areas extend within the Hydrocarbon EMBA. The *Shipping and Pilotage Act 1967* (WA) governs shipping and pilotage in and about ports, boat harbours, and mooring control areas of WA. The Port of Barrow Island is a proclaimed port managed under this Act, and the port area extends within the Hydrocarbon EMBA.

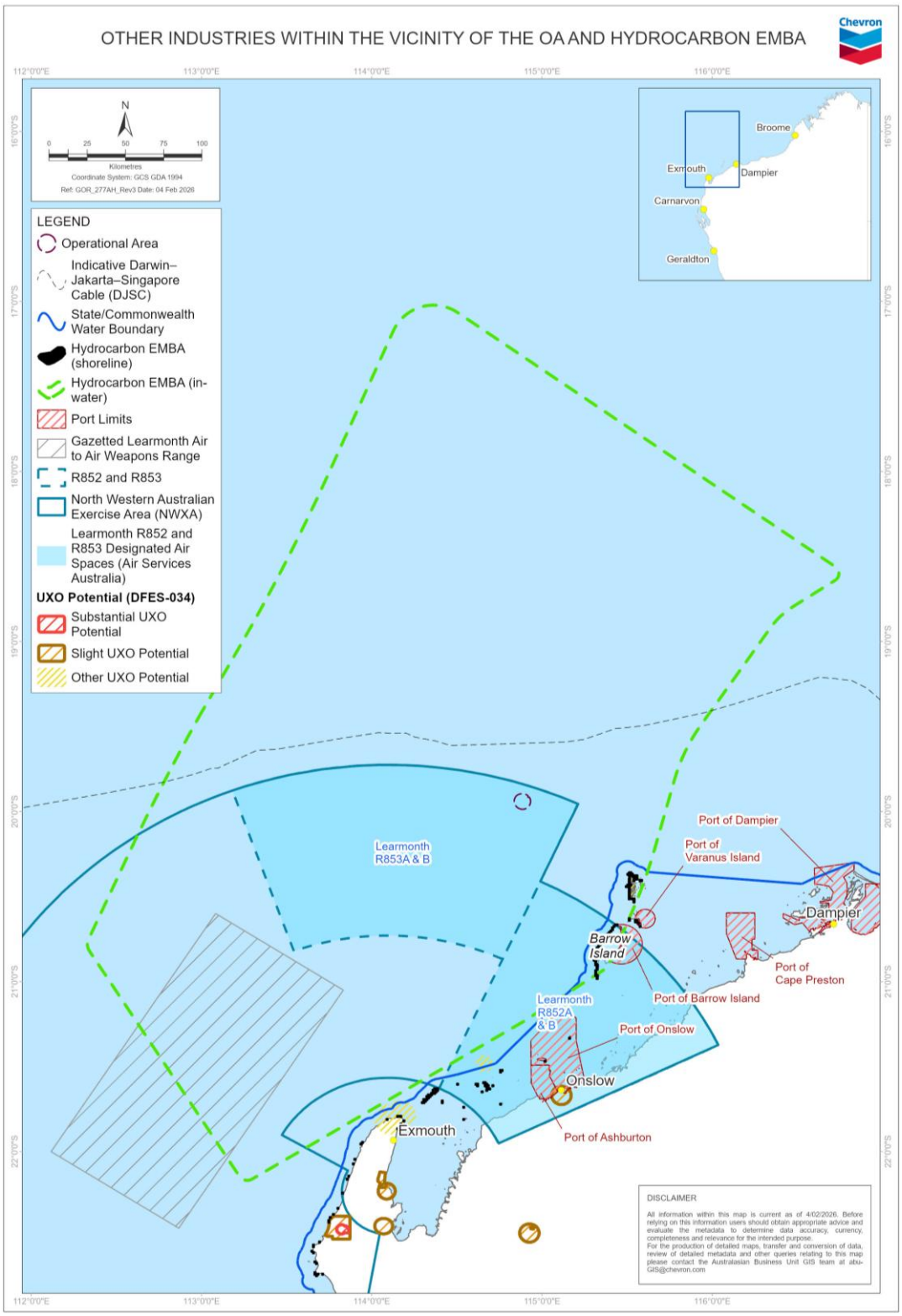


Figure 5-11. Other industries within the vicinity of the OA and Hydrocarbon EMBA

5.5 Qualities and characteristics of locations, places and areas

The qualities and characteristics of the protected places present within the OA and Hydrocarbon EMBA are described in the following sections.

5.5.1 Australian marine parks

Marine parks help conserve marine habitats and the marine species that live within and rely on these habitats. Marine parks also provide places for people to watch wildlife, dive, and go boating, snorkelling, or fishing (Ref. 144).

The North-west Marine Parks Network Management Plan (Ref. 145) defines the following types of values for the Marine Parks in the North-west Network:

- natural values—habitats, species and ecological communities, and the processes that support their connectivity, productivity and function
- cultural values—living and cultural heritage recognising Indigenous beliefs, practices and obligations for Country, places of cultural significance and cultural heritage sites
- heritage values—non-Indigenous heritage that has aesthetic, historic, scientific or social significance
- socioeconomic values—the benefits for people, businesses and/or the economy.

The objectives of the North-west Marine Parks Network Management Plan (Ref. 145) are to provide for:

- the protection and conservation of biodiversity and other natural, cultural and heritage values of marine parks in the North-west Network
- ecologically sustainable use and enjoyment of the natural resources within marine parks in the North Network, where this is consistent with objective (a).

AMPs occur within Commonwealth waters and have been proclaimed under the EPBC Act. There are no AMPs within the OA; the closest is the Montebello Marine Park boundary located ~34 km south-east of the OA. The presence of AMPs within the Hydrocarbon EMBA, and a summary of values, is described in Table 5-24 and shown in Figure 5-12.

Table 5-24: Presence of AMPs

AMP^	OA	Distance from the OA	Hydrocarbon EMBA
Gascoyne (Multiple use zone [IUCN VI])	✗	**~140 km**	✓
The Gascoyne Marine Park is located ~20 km off the west coast of the Cape Range Peninsula, adjacent to the Ningaloo Reef Marine Park and the Western Australian Ningaloo Marine Park, and extends to the limit of Australia's EEZ. The Marine Park covers an area of 81,766 km² and water depths between 15 m and 6,000 m. **Natural values** The Marine Park includes examples of ecosystems representative of: • Central Western Shelf Transition—continental shelf with water depths up to 100 m, and a significant transition zone between tropical and temperate species • Central Western Transition—characterised by large areas of continental slope; a range of topographic features such as terraces, rises, and canyons; seasonal and sporadic upwelling; and benthic slope communities comprising tropical and temperate species • Northwest Province—an area of continental slope comprising diverse and endemic fish communities.			

AMP^	OA	Distance from the OA	Hydrocarbon EMBA
The marine park includes four KEFs characterised by seasonal and sporadic upwelling, nutrient rich water and aggregations of marine life and high diversity of demersal fish assemblages. The Marine Park supports a range of species including species listed as threatened, migratory, marine, or cetacean under the EPBC Act. BIAs within the Marine Park include breeding habitat for seabirds; internesting habitat for marine turtles; a migratory pathway for humpback whales; and foraging habitat and migratory pathway for pygmy blue whales. **Cultural values** Sea Country is valued for First Nations cultural identity, health and wellbeing. Across Australia, First Nations people have been sustainably using and managing their Sea Country for tens of thousands of years. The Baiyungu, Thalanyji and Yinikurtura People have a responsibility for Sea Country in the Marine Park. CAPL's understand through consultation that the Baiyungu, Thalanyji and Yinggarda People are the Traditional Custodians of the Sea Country in the Gascoyne Marine Park **Heritage values** No World, Commonwealth or national heritage listings apply to the Marine Park, however the Marine Park is adjacent to the Ningaloo Coast World heritage area. **Social and economic values** Commercial fishing, mining and recreation are important activities in the Marine Park. These activities contribute to the wellbeing of regional communities and the prosperity of the nation			
Montebello (Multiple use zone [IUCN VI])	✗	**~34 km**	✓
The Montebello Marine Park is located offshore of Barrow Island and 80 km west of Dampier extending from the WA state waters boundary, and is adjacent to the Barrow Island and Montebello Islands Marine Parks. The Marine Park covers an area of 3,413 km² and water depths from <15 m to 150 m. **Natural values** The Marine Park includes examples of ecosystems representative of the Northwest Shelf Province—a dynamic environment influenced by strong tides, cyclonic storms, long-period swells, and internal tides. The bioregion includes diverse benthic and pelagic fish communities, and Ancient coastline. The Ancient coastline at the 125 m depth contour KEF intersects the north-west boundary of the park, thought to be an important sea floor feature and migratory pathway for humpback whales. The Marine Park supports a range of species including species listed as threatened, migratory, marine, or cetacean under the EPBC Act. BIAs within the Marine Park include breeding habitat for seabirds; internesting, foraging, mating, and nesting habitat for marine turtles; a migratory pathway for humpback whales; and foraging habitat for whale sharks. **Cultural values** Sea Country is valued for First Nations cultural identity, health and wellbeing. Across Australia, First Nations people have been sustainably using and managing their Sea Country for tens of thousands of years. At the commencement of this plan, there is limited information about the cultural significance of this Marine Park. CAPL's understand through consultation that the Thalanyji and Nhuwala People are the Traditional Custodians of the Sea Country in the Montebello Marine Park. **Heritage values** No international, Commonwealth or national listings apply to the Marine Park, however the Marine Park is adjacent to the Western Australian Barrow Island and the Montebello– Barrow Island Marine Conservation Reserves which have been nominated for national heritage listing. **Social and economic values** Tourism, commercial fishing, mining and recreation are important activities in the Marine Park. These activities contribute to the wellbeing of regional communities and the prosperity of the nation.			
Ningaloo (Recreational Use Zone (IUCN IV))	✗	**~198 km**	✓
The Ningaloo Marine Park stretches ~300 km along the west coast of the Cape Range Peninsula, and is adjacent to the WA Ningaloo Marine Park and Gascoyne Marine Park. The Marine Park covers an area of 2,435 km² and a water depth range of 30 m to more than 500 m. The Marine Park was originally proclaimed under the *National Parks and Wildlife Conservation Act 1975* on			

AMP^	OA	Distance from the OA	Hydrocarbon EMBA

20 May 1987 as the Ningaloo Marine Park (Commonwealth Waters), and proclaimed under the EPBC Act on 14 December 2013 and renamed Ningaloo Marine Park on 9 October 2017.

Natural values

The Marine Park includes examples of ecosystems representative of:

- Central Western Shelf Transition—continental shelf of water depths up to 100 m, and a significant transition zone between tropical and temperate species
- Central Western Transition—characterised by large areas of continental slope; a range of topographic features such as terraces, rises, and canyons; seasonal and sporadic upwelling; and benthic slope communities comprising tropical and temperate species
- Northwest Province—an area of continental slope comprising diverse and endemic fish Communities
- Northwest Shelf Province—a dynamic environment, influenced by strong tides, cyclonic storms, long-period swells, and internal tides. The bioregion includes diverse benthic and pelagic fish communities, and Ancient coastline thought to be an important sea floor feature and migratory pathway for humpback whales.

Key ecological features of the Marine Park are:

- Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula—an area resulting in upwelling of nutrient-rich water and aggregations of marine life
- Commonwealth waters adjacent to Ningaloo Reef—an area where the Leeuwin and Ningaloo currents interact, resulting in enhanced productivity and aggregations of marine life
- Continental slope demersal fish communities—an area of high diversity among demersal fish assemblages on the continental slope.

Ecosystems represented in the Marine Park are influenced by interaction of the Leeuwin Current, Leeuwin Undercurrent, and the Ningaloo Current.

The Marine Park supports a range of species including species listed as threatened, migratory, marine, or cetacean under the EPBC Act. Biologically important areas within the Marine Park include breeding and or foraging habitat for seabirds; internesting habitat for marine turtles; a migratory pathway for humpback whales; foraging habitat and migratory pathway for pygmy blue whales; breeding, calving, foraging, and nursing habitat for dugong; and foraging habitat for whale sharks.

Cultural values

Sea Country is valued for First Nations cultural identity, health and wellbeing. Across Australia, First Nations people have been sustainably using and managing their Sea Country for tens of thousands of years. The Gnulli people have responsibilities for Sea Country in the Marine Park. The Yamatji Marlpa Aboriginal Corporation is the Native Title Representative Body for the Yamatji region.

CAPL's understand through consultation that the Baiyungu, Thalanyji and Yinggarda People are the Traditional Custodians of the Sea Country in the Ningaloo Marine Park

Heritage values

World heritage

The Marine Park is within the Ningaloo Coast World Heritage Property, recognised for its outstanding universal heritage values, meeting world heritage listing criteria vii and x. In addition to the Marine Park, the world heritage area includes the Western Australian Ningaloo Marine Park, the Muiron Islands, the Western Australian Cape Range National Park and other terrestrial areas. The area is valued for high terrestrial species endemism, marine species diversity and abundance, and the interconnectedness of large-scale marine, coastal and terrestrial environments. The area connects the limestone karst system and fossil reefs of the Ancient Cape Range to the nearshore reef system of Ningaloo Reef, to the Continental slope and shelf in Commonwealth waters.

National heritage

The Ningaloo Coast overlaps the Marine Park and was established on the National Heritage List in 2010, meeting the national heritage listing criteria A, B, C, D, and F.

AMP^	OA	Distance from the OA	Hydrocarbon EMBA
Commonwealth heritage The Ningaloo Marine Area (Commonwealth waters) was established on the Commonwealth Heritage List in 2004, meeting Commonwealth heritage listing criteria A, B and C. The Ningaloo Marine Area overlaps the Marine Park. **Historic shipwrecks** The Marine Park contains more than 15 known shipwrecks listed under the UCH Act. **Social and economic values** Tourism and recreation, including fishing, are important activities in the Marine Park. These activities contribute to the wellbeing of regional communities and the prosperity of the nation.			

^*Source: Ref. 145.*

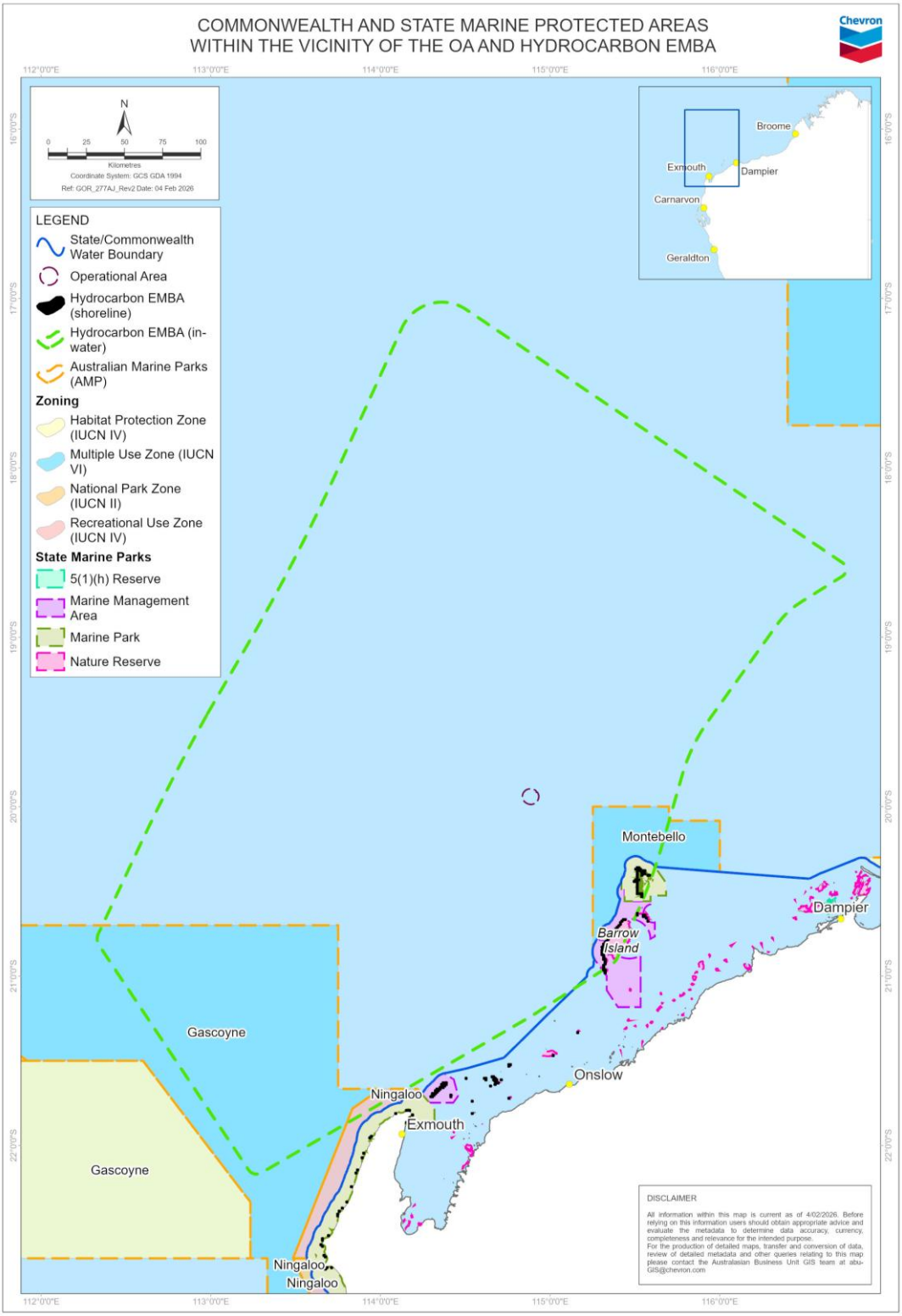


Figure 5-12. Commonwealth and State marine protected areas within the vicinity of the OA and Hydrocarbon EMBA

5.5.2 State marine protected areas

State marine parks, management areas and reserves, proclaimed under the CALM Act, are located in State waters and are vested in the WA Conservation and Parks Commission.

There are no State marine parks or management areas within the OA; the closest is the Montebello Islands Marine Park, located ~65 km south-east of the OA. The presence of marine parks or management areas within the Hydrocarbon EMBA is shown in Table 5-25 and Figure 5-12.

Table 5-25: Presence of state marine parks, management areas and reserves

State marine parks protected areas	IUCN Zones	OA	Distance from the OA	Hydrocarbon EMBA
Barrow Island Marine Park	Unassigned (IUCN Ia)	×	~92 km	✓
Barrow Island Marine Management Area	Unassigned (IUCN VI)	×	~75 km	✓
Exmouth Gulf Marine Park (Declared, not yet gazetted)	Not defined yet	×	~185 km	✓
Montebello Islands Marine Park	General Use Zone (IUCN II)	×	~67 km	✓
	Recreation Zone (IUCN II)	×	~85 km	✓
	Sanctuary Zone (IUCN IA)	×	~70 km	✓
	Special Purpose Zone (Benthic Protection) (IUCN IV)	×	~67 km	✓
	Special Purpose Zone (Pearling) (IUCN VI)	×	~78 km	✓
Muiron Islands Marine Management Area	Conservation Area (IUCN Ia)	×	~195 km	✓
	Unclassified (IUCN VI)	×	~183 km	✓
Ningaloo Marine Park	General Use (IUCN II)	×	~200 km	✓
	Recreation Area (IUCN II)	×	~210 km	✓
	Sanctuary Zone (IUCN IA)	×	~210 km	✓
	Special Purpose Zone (Benthic Protection) (IUCN IV)	×	~255 km	✓
	Special Purpose Zone (Shore Based Activities) (IUCN II)	×	~210 km	✓

5.5.3 State terrestrial protected areas

Terrestrial protected areas, proclaimed under the CALM Act, are located in State lands and are vested in the WA Conservation and Parks Commission.

The OA occurs offshore and does not have any interface with the coast. The Hydrocarbon EMBA interfaces with the coast, including parts of Barrow Island, the Montebello Islands, other Pilbara inshore islands, as well as some parts of the mainland coast along the North West Cape (Figure 5-1). The State terrestrial protected areas that intersect with the Hydrocarbon EMBA are shown in Table 5-26.

Table 5-26: Presence of state terrestrial protected areas

Land protected areas	IUCN Zones	OA	Hydrocarbon EMBA
Barrow Island Nature Reserve*	Nature Reserve (IUCN Ia)	×	✓
Boodie, Double Middle Islands Nature Reserve*	Nature Reserve (IUCN Ia)	×	✓
Bundegi Coastal Park^	5(1)(h) Reserve	×	✓
Cape Range National Park^	National Park (IUCN II)	×	✓
Cape Range South National Park ^	National Park (IUCN II)	×	✓
Jurabi Coastal Park^	5(1)(h) Reserve	×	✓
Montebello Islands Conservation Park^	Conservation Park (IUCN II)	×	✓
Nyingguulu (Ningaloo) Coastal Reserve^	5(1)(h) Reserve	×	✓
Pilbara Islands Nature Reserves[32]*^	Nature Reserve (IUCN Ia)	×	✓

** Protected area is landward of LWM*

^ Protected area is landward of HWM.

5.6 Heritage value of places

Listed World Heritage properties, and National Heritage places, are MNES under the EPBC Act, and a relevant value and sensitivity under the OPGGS(E)R. Table 5-27 identifies the presence of these, and other marine or coastal heritage protected places, within the OA and Hydrocarbon EMBA.

Table 5-27: Presence of heritage values

Feature	OA	Hydrocarbon EMBA
World Heritage property		
The Ningaloo Coast	×	✓
National Heritage place		
The Ningaloo Coast	×	✓
Commonwealth Heritage place		
Learmonth Air Weapons Rage Facility	×	✓
Ningaloo Marine Area – Commonwealth Waters	×	✓
Indigenous Protected Area		
N/A	(none identified within the OA and Hydrocarbon EMBA)	
Sites or artefacts protected under the *Underwater Cultural Heritage Act 2018* (Cth)		
Historic shipwrecks (>75 years old)	×	✓
Shipwrecks	×	✓
Sunken aircraft	(none identified within the OA or Hydrocarbon EMBA)	

[32] The Pilbara Inshore Islands management plan includes 20 existing nature reserves, with several small unallocated Crown Land islands proposed to become nature reserves. Of the existing nature reserves, the EMBA interact with Airlie, Bessieres, Locker, Lowendal, Muiron, Round and Serrurier Islands.

Feature	OA	Hydrocarbon EMBA
In situ artefacts	(none identified within the OA or Hydrocarbon EMBA)	
Sites or artefacts protected under the *Aboriginal Cultural Heritage Act 1972* (WA)[33]		
28 Mile Creek North 1 (Artefacts / Scatter; Midden)	×	✓
Bloodwood Creek Shoreline (Artefacts / Scatter; Midden)	×	✓
Camp Thirteen Burial (Burial)	×	✓
Camp 17 South Middens (Artefacts / Scatter; Midden)	×	✓
Camp 17 North Middens (Artefacts / Scatter; Midden)	×	✓
Mandu Mandu Creek South (Artefacts / Scatter; Midden)	×	✓
Mandu Mandu Creek North (Artefacts / Scatter; Midden)	×	✓
Mandu Mandu Ck Rockshelters (Artefacts / Scatter)	×	✓
Mangrove Bay (Burial; Artefacts / Scatter; Hunting Place; Midden)	×	✓
Mesa Camp (Artefacts / Scatter; Midden)	×	✓
Osprey Bay 2 (Artefacts / Scatter; Midden)	×	✓
Osprey Bay 3 (Artefacts / Scatter; Midden)	×	✓
Osprey Bay 4 (Artefacts / Scatter; Midden)	×	✓
Osprey Bay Interdunal 1 (Artefacts / Scatter; Midden)	×	✓
Osprey Bay Interdunal 2 (Midden)	×	✓
Point Murat 03 (Artefacts / Scatter; Midden)	×	✓
Wealjugoo Midden (Artefacts / Scatter; Camp; Hunting Place; Midden)	×	✓
Yardie Creek South 1 (Artefacts / Scatter; Midden)	×	✓
Determined areas under the *Native Title Act 1993* (Cth)		
Native Title determination WCD2019/016	×	✓
Claim areas under the *Native Title Act 1993* (Cth)		
WC2024/007	×	✓
WC2024/008	×	✓

[33] Only Aboriginal Sites, being a place described under Section 5 of the *Aboriginal Heritage Act 1976* (WA), with a potential coastal and/or marine interface that intersect with the geographic extent of the Hydrocarbon EMBA (including areas of predicted shoreline loading) have been included. This is considered a conservative approach, as the heritage sites within the Department of Planning, Lands and Heritage spatial dataset (Ref. 149) include a buffer around sites to protect privacy regarding the location. As such, the identified heritage sites may not be present within the Hydrocarbon EMBA.

5.6.1 Ningaloo coast

The Ningaloo Coast is located in WA adjacent to the East Indian Ocean. The area has a high level of terrestrial species endemism, and high marine species diversity and abundance (Ref. 146). The waters of the Ningaloo Coast contain one of the best developed near-shore reefs in the world, a continuous series of more than 200 km of wave-swept ramparts off a rugged limestone peninsula (Ref. 147). The integration of the Ningaloo Reef and Exmouth Peninsula karst system as a cohesive limestone structure is at the heart of the natural heritage significance of the Ningaloo Coast (Ref. 147).

The marine portion of the World Heritage property contains a high diversity of habitats that includes lagoon, reef, open ocean, the continental slope, and the continental shelf (Ref. 146). Intertidal systems such as rocky shores, sandy beaches, estuaries, and mangroves are also present (Ref. 146). The most dominant marine habitat is Ningaloo Reef, which sustains both tropical and temperate marine fauna and flora, including marine reptiles and mammals (Ref. 146).

The main terrestrial feature of the Ningaloo Coast is the extensive karst system and network of underground caves and water courses of the Cape Range (Ref. 146). The karst system includes hundreds of separate features such as caves, dolines, and subterranean water bodies and supports a rich diversity of highly specialised subterranean species (Ref. 146). Above ground, the Cape Range Peninsula belongs to an arid ecoregion recognised for its high levels of species richness and endemism, particularly for birds and reptiles (Ref. 146).

In addition to the natural values of the Ningaloo Coast, values of Traditional Owners are identified under the National Heritage listing (Ref. 148). Archaeological deposits in the rock shelters on Cape Range show Traditional Owners had a sophisticated knowledge of marine resources between 35,000 and 17,000 years ago. Shell beads have been dated to more than 32,000 old, which is the earliest evidence known in Australia for the manufacture of personal ornaments (Ref. 148). The rock shelters are considered to provide the best evidence in Australia for the use of marine resources during the Pleistocene (Ref. 147).

5.6.2 Underwater cultural heritage

Australia's UCH is primarily protected under the UCH Act; this legislation protects shipwrecks, sunken aircraft and other types of underwater heritage, including First Nations UCH in Australian waters[34]. Additional Acts that further provide for the recognition, protection and management of Aboriginal UCH within Australian waters include the:

- *Aboriginal Heritage Act 1972* (WA) to the extent located within the territorial waters of WA
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (Cth)
- *Native Title Act 1993* (Cth).

Under section 15 of the UCH Act, UCH is defined as "any trace of human existence that has a cultural, historical, or archaeological character, and is located under water". The UCH Act protects physical sites and artefacts; intangible

[34] The UCH Act applies to all Australian waters, including both State waters (coastal waters) and Commonwealth waters (extending from coastal waters to the edge of continental shelf)

heritage values with no physical component are not protected under the Act (Ref. 9). Types of physical UCH protected may include sites, structures, buildings, artefacts, human or animal remains, vessels, aircraft, or other vehicles, together with their archaeological and natural context (Ref. 9).

No known UCH was identified in the OA which is located in water depths of >1,100 m and has been assessed as having a very low probability of encountering any historic UCH (Ref. 149). Within the Hydrocarbon EMBA there are known UCH that comprise mainly shipwrecks and two military sea dumping sites. The exact location of many of the lost ships are not known and there is also the possibility of unknown UCH to be present in the Hydrocarbon EMBA. The shallower waters within the Hydrocarbon EMBA have a higher relative likelihood of encountering UCH than the deeper waters, given the concentration of maritime infrastructure, anchorage activity, navigational hazards, and vessel groundings, as well as increased potential for the survival of remains (Ref. 149).

Although outside the Hydrocarbon EMBA, evidence from offshore waters near Murujuga (Burrup Peninsula) and on Barrow Island are indicative of the historical and ongoing connection of First Nations people to the NWMR. Australia's first confirmed First Nations underwater archaeological sites were identified in 2020 in waters offshore from Murujuga (Burrup Peninsula) during the Deep History of Sea Country Project (Ref. 150). These findings confirmed an understanding that First Nations people would have lived on lands that are now submerged in water from rising seas after the last glacial maximum (LGM)[35]. Recent studies at Murujuga have demonstrated that archaeological material remains on the seabed, predating inundation by rising seas (Ref. 150; Ref. 152).

At the LGM sea level was ~125 m below present (Ref. 153); this coincides with the ancient coastline at 125 m depth KEF (see Section 5.3.6.1 for a description of this KEF). The OA is in >1,100 m water depth and has never been part of habitable land and therefore, no Aboriginal UCH is expected.

Sea Country values (intangible values) may be identified through the consultation phases, although not protected under the UCH Act; however, it is noted that consideration of intangible cultural heritage can contribute to the understanding and potential identification of Aboriginal UCH that is eligible to be protected under the UCH Act (Ref. 9).

The consultation undertaken during the preparation of this EP is summarised in Section 7. During this consultation, no Aboriginal UCH has been identified within the OA or Hydrocarbon EMBA where seabed disturbance could credibly occur.

5.6.3 Native title

Native Title recognises the rights and interests of Aboriginal and Torres Strait Islander people in land and waters according to their traditional laws and customs and is administered under the *Native Title Act 1993* (Cth).

A desktop review of the National Native Title Tribunal Database (Ref. 154) was undertaken to determine the presence of native title determinations or claims either within or intersecting the OA or Hydrocarbon EMBA. A summary of the determination is provided below.

[35] The period of the LGM in Australia is described as 24 to 18 ka (Ref. 151).

5.6.3.1 Native title determination (WCD2019/016)

A Native Title determination (WCD2019/016) extends over the Ningaloo Coast area. The Yinggarda, Baiyungu, and Thalanyji people received recognition as a Native Title holder over an area of 71,354 m^2. The determination area encompasses several pastoral leases, mining tenements, roads, and reserves, as well as portions of the Kennedy Range and Cape Range national parks, Ningaloo Marine Park, Lake MacLeod, and waters in the Exmouth Gulf and Ningaloo Marine Park (Ref. 102). The Yinggarda, Baiyungu and Thalanyji people have each maintained a physical presence in their respective part of the determination area and have a continuing physical or spiritual connection in that area (Ref. 102). The determination area contains places of cultural significance, such as cultural, spiritual and ceremonial sites and natural resources (Ref. 102).

The relevant Prescribed Bodies Corporates (PBCs) are the Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC) (representing Baiyungu) and the Yinggarda Aboriginal Corporation (YAC).

5.6.3.2 Native title claims (WC2024/007 and WC2024/008)

Two Native Title claims were lodged in November and December 2024 on behalf of the Thalanyji/Nhuwala People (WC2024/007) and the Nhuwala Claim Group (WC2024/008) (Ref. 155), respectively. These claims were accepted and are awaiting determination by the National Native Title Tribunal. The claim areas do not intersect the OA but may intersect with the EMBA (Table 5-27).

The claim areas lie adjacent to an exisiting Thalanyji Native Title determination (WCD2008/003) and encompass lands from Onslow to Cane River. In addition, islands off the coast of Onslow and an associated area of ocean bordered by Thevenard, Rosily, Airlie and Mangrove Islands have been included in the claim.

The onshore claim area encompasses similar parts unallocated Crown Land and pastoral leases with some conservation reserves/parks. Offshore islands and waters encompass both conservation reserves/parks and unallocated Crown Land (Ref. 155).

6 Environmental impact and risk assessment method

This section describes the methods used to identify and evaluate the environmental impacts and risks arising directly or indirectly from the petroleum activity and any potential emergency conditions as required under regulations 21(5) and 21(6) of the OPGGS(E)R.

CAPL undertakes environmental impact and risk assessments in accordance with Chevron Corporation's *Environment Risk Management Process* (ERMP) (Ref. 184), and *Environmental Risk Assessment Management Procedure* (ERAM Procedure) (Ref. 159), and uses Chevron Corporation's Integrated Risk Prioritisation Matrix (Table 6-2) from the ABU OE *Risk Management RiskMan Procedure* (Ref. 157). This approach generally aligns with the processes outlined in ISO 31000:2018 *Risk management – Principles and guidelines* (Ref. 158).

The potential environmental impacts and risks identified and evaluated in this EP were informed by:

- expertise and experience of CAPL and Chevron Corporation personnel
- relevant persons consultation (Section 7).

6.1 Description of the petroleum activity

The petroleum activity is described in Section 4.

6.2 Identification of relevant values and sensitivities

The presence of environmental values and sensitivities within the OA and Hydrocarbon EMBA are described in Section 5.

In accordance with regulation 21(3) of the OPGGS(E)R, relevant values and sensitivities may include any of the following:

- the world heritage values of a declared World Heritage property
- the national heritage values of a National Heritage place
- the ecological character of a declared Ramsar wetland
- the presence of a listed threatened species or listed TECs
- the presence of a listed migratory species
- any values and sensitivities that exist in, or in relation to, part or all of:
  - a Commonwealth marine area
  - Commonwealth land.

Because many protected fauna have the potential to transit through the OA and/or Hydrocarbon EMBA, CAPL considers the habitat and/or temporal area that supports protected fauna (including areas defined as BIAs for these species) is part of the relevant value or sensitivity.

Environmental values and sensitivities are also considered to be associated with each of the receptor groups identified and described in Section 5 (i.e. in addition to those relevant values and sensitivities as identified under the OPGGS(E)R). All environmental values and sensitivities have been taken into consideration during the consultation process (and the identification of associated functions, interests, or activities; Section 7), and the impact and risk evaluation (Section 8).

6.3 Identification of relevant environmental aspects

The ERAM Procedure (Ref. 159) describes an environmental aspect as an element of CAPL's products, services, or activities that interact with the environment while within CAPL's operational control.

After the petroleum activity was described, an assessment was done to identify potential interactions between the petroleum activity and the receiving environment by identifying the environmental aspects. The outcomes of relevant persons consultation also contributed to this scoping process.

Note: Any potential interactions with safety, health, and assets are outside the scope of this EP.

Environmental aspects categories included in the impact and risk assessment of this petroleum activity are:

- physical presence
- planned emissions
- planned discharges
- unplanned disturbance
- non-indigenous species
- unplanned releases
- oil spill response
- cultural heritage.

Table 6-1 maps these environmental aspects against the petroleum activity.

Table 6-1: Relationship between environmental aspects and the petroleum activity

Environmental aspect		Petroleum activity			Emergency response
Category	**Description**	**Drilling and completions**	**IMR**	**Support activities**	
Physical presence	Vessels, infrastructure and/or equipment	✓	✓	✓	✓
	Seabed disturbance	✓	✓	✓	
Planned emissions	Atmospheric	✓	✓	✓	
	Greenhouse gases	✓	✓	✓	
	Artificial light		✓	✓	
	Underwater sound (non-impulsive)	✓	✓	✓	
	Underwater sound (impulsive)	✓	✓		
Planned discharges	MODU and vessel operations			✓	
	Drilling operations	✓	✓		
Unplanned disturbance	Fauna interaction			✓	
	Seabed disturbance			✓	
Non-indigenous species	Introduction of invasive marine pests			✓	
Unplanned releases	Solid waste			✓	
	Leaks and spills	✓	✓	✓	
	Loss of containment (vessel collision event)			✓	
	LOWC	✓	✓		
Oil spill response	Dispersant use				✓
	Shoreline clean-up				✓
	Oiled wildlife response				✓
Cultural heritage	Intangible values	✓	✓	✓	✓

6.4 Identification of relevant environmental impacts and risks

The ERAM Procedure (Ref. 159) describes:

- **environmental impact**—as any change to the environment, whether adverse or beneficial, wholly or partially resulting from an environmental aspect
- **environmental risk**—as a measure of environmental impacts caused by environmental aspects in terms of both likelihood and consequence (magnitude) of the impact.

Potential environmental impacts and risks arising from the environmental aspects were identified during a scoping exercise.

Note: An environmental aspect can result in both environmental impacts and risks.

6.5 Evaluation of environmental impacts and risks

After identifying the credible interactions between environmental aspects and environmental values and sensitivities (receptors), each potential environmental impact and risk was evaluated. This evaluation involved:

- determining the consequence of each impact and risk
- for risks, determining the likelihood of the consequence occurring (with control measures in place) and corresponding residual risk level.

The consequence, likelihood, and residual risk levels were determined using Chevron Corporation's Integrated Risk Prioritisation Matrix (Table 6-2).

Table 6-2: Chevron corporation's integrated risk prioritisation matrix[36]

Likelihood Descriptions									
	Expected to occur	Likely	1	6	5	4	3	2	1
	Conditions may allow to occur	Occasional	2	7	6	5	4	3	2
	Exceptional conditions may allow to occur	Seldom	3	8	7	6	5	4	3
	Reasonable to expect will not occur	Unlikely	4	9	8	7	6	5	4
	Has occurred once or twice in the industry	Remote	5	10	9	8	7	6	5
	Rare or unheard of	Rare	6	10	10	9	8	7	6
Consequence Descriptions				6	5	4	3	2	1
				Incidental	Minor	Moderate	Major	Severe	Catastrophic
				Limited impact	Localised short-term impact	Localised long-term impact, or widespread short-term impact	Localised persistent impact, or widespread long-term impact	Widespread persistent impact, or landscape-scale long-term impact	Landscape-scale persistent impact

[36] Where likelihood is with confirmed and verified safeguards; consequence is without safeguards

6.5.1 Consequence

The consequence levels are determined by considering:

- the spatial scale or extent of potential interactions within the receiving environment
- the nature of the receiving environment (within the spatial extent), including proximity to sensitive receptors, relative importance, and sensitivity or resilience to change
- the impact mechanisms (cause and effect) of the aspect within the receiving environment (e.g. persistence, toxicity, mobility, bioaccumulation potential)
- the duration and frequency of potential effects and time for recovery
- the potential degree of change relative to the existing environment or to acceptability criteria.

To inform the consequence evaluation, data may be drawn from engineering analysis, generic industry data, or operator-specific data to provide confidence in the assigned consequence level. Different techniques to inform the consequence evaluation may be required for complex aspects (Ref. 161), such as modelling to define the spatial scale of an aspect relative to sensitive receptors.

Values and sensitivities may be grouped together (e.g. marine fauna) in the same impact or risk assessment, if they have the same consequence ranking and it is appropriate to nature and scale.

6.5.2 Control measures

The OPGGS(E)R defines a control measure as “a system, an item of equipment, a person or a procedure, that is used as a basis for managing environmental impacts and risk of an activity”. Regulation 21(5)(c) of the OPGGS(E)R requires this EP to include details of the control measures that will be used to reduce the impacts and risks of the petroleum activity to as low as reasonably practicable (ALARP) and an acceptable level.

The ERAM Procedure (Ref. 159) adopts an environmental mitigation hierarchy based on the IPIECA mitigation hierarchy (Ref. 162). The application of the environmental mitigation hierarchy identifies opportunities to limit potential negative impacts on environmental receptors of concern. The two preventative mitigation steps are:

- **avoid**—measures taken to anticipate and prevent potential negative impacts before actions or decisions are taken that could lead to such impacts
- **reduce**—measures taken to reduce the duration, intensity, significance and/or extent of potential impacts (including direct, indirect, and cumulative impacts, as appropriate) that cannot be completely avoided.

In accordance with NOPSEMA guidance (Ref. 163), the effort given to exploring control measures must be commensurate with the predicted level of impact and risk; i.e. higher-order impacts and risks require a level of evaluation that is higher than what would be required for lower-order impacts and risks where good practice control measures exist.

CAPL evaluates all potential environmental impacts and risks as lower-order until one or more factors trigger the impact or risk to be evaluated at a higher level. Factors that may trigger consideration as a higher-order impact or risk are:

- uncertainty or complexity in the impact or risk assessment (e.g. where modelling has been used to define the spatial scale of an aspect relative to sensitive receptors)
- a consequence level of 1–3 (Table 6-2) for potential environmental impacts, or a residual risk level of 1–5 (Table 6-2) for potential environmental risks
- ALARP type B or C decision context (Section 6.5.2.1)
- any new material information or concerns raised by relevant persons that justify evaluation at a higher level [37] (Section 7; Appendix E).

CAPL consider that ALARP has been demonstrated if good practice control measures have been adopted, and where commensurate with the predicted level of impact and risk, reasonably practicable control measures that are not grossly disproportionate to the risk benefit (environmental benefit) have also been adopted.

6.5.2.1 ALARP decision context

CAPL has adapted the approach developed by Offshore Energies UK (OEUK) (Ref. 161) and described in NOPSEMA's *ALARP guidance note* (Ref. 160) for use in an environmental context to inform the assessment technique(s) that may be required to demonstrate that impacts and risks have been reduced to ALARP. The ALARP decision making framework (Ref. 161) provides a structured approach to the determination of whether it is reasonably practicable to implement a control measure.

The first step in applying the framework is to determine the decision context. Three key factors are considered in determining the decision context (Figure 6-1):

- activity type
- risk and uncertainty
- stakeholder influence.

For the different decision contexts, the decision-making framework (Figure 6-1) suggests appropriate assessment techniques to support an ALARP demonstration.

A **Type A decision context** (Figure 6-1) is made for lower-order impacts and risks (Table 6-2) where they are relatively well understood, activities are well-practised, and there is no significant stakeholder interest. In general, the assessment technique to demonstrate ALARP is the application of good practice control measures. However, additional assessment may be required on a case-by-case basis (e.g. if good practice is not sufficiently well defined, as requested by regulator or other stakeholders, etc.). In addition, where an environmental aspect associated with the petroleum activity is listed as either a threat to a protected matter under an instrument made or implemented under the EPBC Act (such as recovery plans, conservation advices, threat abatement plans, or wildlife conservation plans), or identified as an aspect of concern to a listed conservation value under an EPBC Act marine bioregional plan, and can result in a credible impact or risk to these sensitivities, additional control consideration may be undertaken.

[37] Consideration of a risk or impact for a higher level of evaluation will be triggered if information is raised which has not already been considered or addressed in preparation of the EP and that information has a credible potential to significantly affect how the environmental impacts or risks are assessed or managed.

A **Type B decision context** (Figure 6-1) is made for higher-order impacts and risks (Table 6-2) if there is greater uncertainty or complexity around the petroleum activity, and there are relevant concerns from stakeholders. In this instance, established good practice is not considered sufficient (but must still be met) and further engineering risk assessment is required to demonstrate the impact or risk has been reduced to ALARP.

A **Type C decision context** (Figure 6-1) typically involves sufficient complexity, higher-order impact and risks (Table 6-2), uncertainty, or stakeholder interest to require a precautionary approach. In this case, relevant good practice must still be met, additional engineering risk assessment is required, and the precautionary approach must be considered in the decision to adopt or not adopt the control measure.

The decision context and relevant assessment technique is applied to each aspect evaluated in Section 8.

Good practice

OEUK defines good practice as “the generic term for those standards for controlling risk which have been judged and recognised by HSE as satisfying the law when applied to a particular relevant case in an appropriate manner” (Ref. 161). The OEUK guidance notes that good practice may take multiple forms, including both written (e.g. codes, guidelines, standards) and unwritten (e.g. well-defined and established standard industry practice) sources.

For this EP, sources of good practice include:

- requirements from Australian legislation and regulations
- relevant Australian Government policies and guidance
- relevant industry standards
- relevant international conventions.

If the ALARP technique is determined to be good practice, further assessment (an engineering risk assessment) is generally not required to identify additional control measures.

Engineering risk assessment

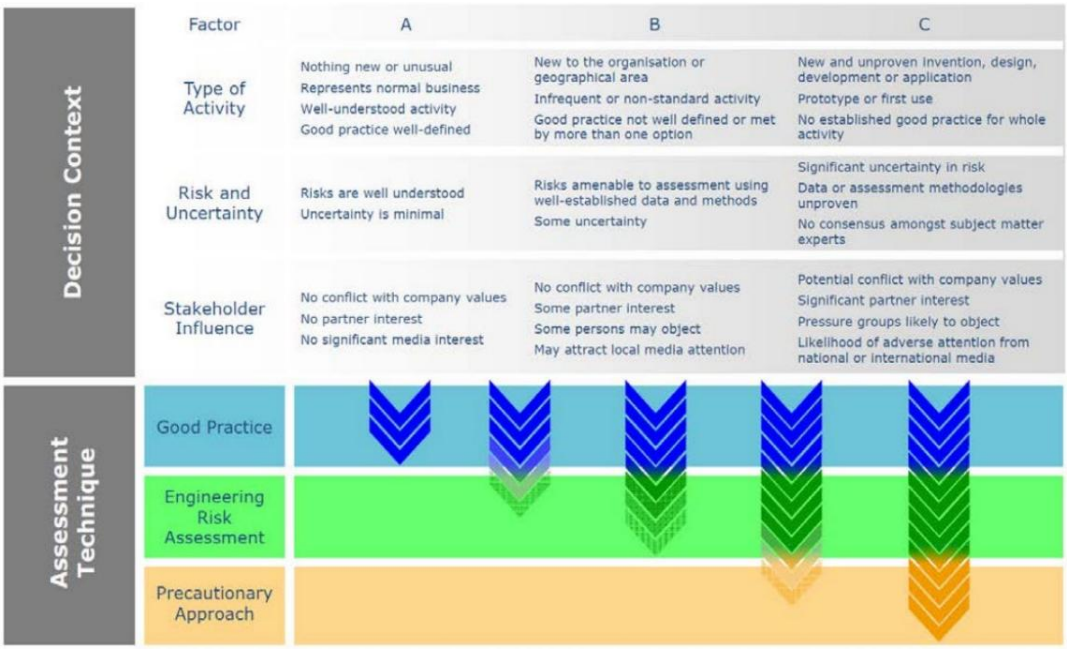
Based on the various assessment techniques identified by OEUK (Ref. 161), CAPL believes the technique most suited to an EP is a cost benefit analysis, a comparative assessment to show the balance between the risk benefit (or environmental benefit) and the cost of implementing the control measure.

The cost benefit analysis should differentiate whether a control measure is reasonably practicable to implement, or if the cost is grossly disproportionate to the benefits of the risk reduction.

Precautionary approach

OEUK (Ref. 161) indicate that if the assessment, taking account of all available engineering and scientific inputs, is insufficient, inconclusive, or uncertain, then a precautionary approach to management is needed. A precautionary approach will mean that uncertain analysis is replaced by conservative assumptions that will result in a control measure being more likely to be implemented. The level to which this precautionary approach is adopted should be commensurate with the level of uncertainty in the assessment and the magnitude of potential adverse consequences (Ref. 161).

Under the precautionary principle, 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. While the control measures adopted should be proportionate to the potential impact or risk, in this decision context, the decision could have significant economic consequences to an organisation (Ref. 161).



(Source: Ref. 161)

Figure 6-1: ALARP decision support framework

6.5.3 Likelihood

For environmental impacts likelihood is not considered.

For environmental risks, where the environmental aspect or unplanned event may lead to environmental impacts under certain circumstances, the likelihood (probability) of the defined consequence occurring is determined. The likelihood is considered by assuming that all control measures are in place. The likelihood of a consequence occurring was identified using one of the six likelihood categories, as shown in Table 6-2.

6.5.4 Residual risk

For environmental risks, the combination of the consequence and likelihood indices from the *Integrated Risk Prioritisation Matrix* (Table 6-2) result in a residual risk level between one (highest residual risk) and 10 (lowest residual risk)

Risk assessment outcomes are based solely on assessment of risk to the environment (as defined under the OPGGS(E)R.

6.6 Acceptable levels

Regulation 34(c) of the OPGGS(E)R requires that an EP “demonstrates that the environmental impacts and risks of the activity will be managed to an acceptable level”.

NOPSEMA’s guidance for EPs (Ref. 22) defines an acceptable level as “the specified amount of environmental impact and risk that an activity may have which

is tolerable, is consistent with all relevant principles, and does not compromise the management/conservation/protection objectives of the environment".

Acceptable level(s) of impact and risk should be defined having regard to all relevant contexts including, but not limited to:

- principles of ecologically sustainable development (ESD)
- legislative and other requirements (e.g. laws, policies, standards, conventions, statutory instruments such as recovery plans for threatened species, plans of management for protected places)
- internal context (e.g. corporate policies, culture, processes, standards and systems)
- external context (e.g. existing environment, stakeholder expectations).

Acceptable levels for the Backfill Fields Development were identified and described in Section 7.6 of the OPP (Ref. 3). Acceptable levels relevant to the petroleum activity within this EP are presented in Table 6-3.

Table 6-3: Backfill Fields Development acceptable levels relevant to this petroleum activity

Aspect	Environmental value or sensitivity	Acceptable level(s)[38],[39]
Planned activities		
Physical presence–vessels and equipment	Commercial fisheries	**AL-18:** No interference with other lawful marine users within the petroleum title areas to a greater extent than is necessary for the reasonable exercise of the rights and performance of duties as conferred to the titleholder under section 280 of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth)
	Commercial shipping	
Physical presence–seabed disturbance	Water quality	**AL-01** Impacts on marine environmental quality from the Development will not prevent the conservation of biodiversity and maintenance of ecosystem integrity within the Development Area
	Benthic habitats and associated communities	**AL-02:** Impacts on benthic habitats and associated communities from the Development will not prevent the conservation of biodiversity and maintenance of ecosystem integrity within the Development Area
	Underwater cultural heritage	**AL-04:** No adverse impact[40] on declared or protected underwater cultural heritage[41] from the Development that would be inconsistent with the protection and conservation objects of the *Underwater Cultural Heritage Act 2018* (Cth).
Planned emissions–atmospheric	Air quality	**AL-01** (see above)

[38] Acceptable level numbering is consistent with the Backfill Fields Development OPP (Ref. 3).

[39] Where an acceptable level refers to the 'Development Area', this is Development Area for the Backfill Fields Development as defined within Section 4.1.3 of the OPP (Ref. 3).

[40] Where 'adverse impact' is defined under section 30 of the UCH Act.

[41] Where underwater cultural heritage is defined under section 15 of the UCH Act.

Aspect	Environmental value or sensitivity	Acceptable level(s)[38],[39]
Planned emissions– greenhouse gases	Atmospheric GHG concentration	**AL-08**: Greenhouse gas emissions from the Gorgon Gas Development[42],[43],[44] will be within limits as set by the *National Greenhouse and Energy Reporting Act 2007* (Cth) and *Environmental Protection Act 1986* (WA)
Planned emissions– artificial light	Ambient light	**AL-12:** Impacts from the Development will not interfere with the recovery of the population of an EPBC Act listed threatened species. **AL-13:** Impacts from the Development will not be inconsistent with the requirements of threatened species recovery plans made or adopted under the EPBC Act. **AL-14:** Impacts from the Development will not decrease the availability or quality of marine fauna habitat to the extent that it interferes with the recovery of the population of an EPBC Act listed threatened species. **AL-15:** Impacts from the Development will not decrease the availability or quality of important habitat[45] to the extent that it interferes with the survival of the population of an EPBC Act listed migratory species
	Marine reptiles	
	Fishes, including sharks and rays	
	Seabirds and shorebirds	
Planned emissions– underwater sound (non-impulsive) Planned emissions– underwater sound (impulsive)	Ambient sound	**AL-12**, **AL-13**, **AL-14**, and **AL-15** (see above)
	Marine mammals	
	Marine reptiles	
	Fishes, including sharks and rays	
Planned discharges– MODU and vessels discharges	Water quality	**AL-01** (see above)
	Fishes, including sharks and ray	**AL-12**, **AL-13**, **AL-14**, and **AL-15** (see above)
	Seabirds and shorebirds	
Planned discharges– drilling operations	Water quality	**AL-01** (see above)
	Sediment quality	
	Benthic habitats and associated communities	**AL-02** (see above)
	Marine mammals	**AL-12**, **AL-13**, **AL-14**, and **AL-15** (see above)
	Marine reptiles	

[42] The Gorgon Gas Development includes the GFP, the Development, and potential future development of other Greater Gorgon Area fields. GHG emissions from the Gorgon Gas Development incorporates direct (Scope 1) GHG emissions from the Gorgon GTP and Gorgon Operations Facility.

[43] The 'Gorgon GTP' includes all direct (Scope 1) GHG emissions from the current operational Gorgon Gas Development facilities (as outlined in MS 800) (Section 8.3.6.1 of the OPP [Ref. 3]).

[44] 'Gorgon Operations' is registered with the CER as a facility under both the NGER and Safeguard Mechanism schemes (Section 8.3.5.3 of the OPP [Ref. 3]). The reporting boundary of the Gorgon Operations Facility includes relevant Scope 1 emissions from the 'Gorgon GTP' and associated facilities on Barrow Island, as well as relevant Scope 1 emissions from activities or facilities in Commonwealth waters as determined in accordance with CAPL's reporting obligations under the NGER Scheme.

[45] Where important habitat for migratory species are defined within the MNES Significant Impact Guidelines (Ref. 48).

Aspect	Environmental value or sensitivity	Acceptable level(s)[38],[39]
	Fishes, including sharks and rays	
Unplanned events		
Unplanned disturbance–fauna interaction	Marine mammals	**AL-19:** No death or injury to an EPBC Act listed threatened species, migratory species, marine species or cetacean species within the Commonwealth marine area attributable to the Development
	Marine reptiles	
	Fishes, including sharks and rays	
	Seabirds and shorebirds	
Unplanned disturbance–seabed disturbance	Benthic habitats and associated communities	**AL-21:** No unplanned release of solid objects to the environment from the Development
	Underwater cultural heritage	
Non-indigenous species–introduction of invasive marine pests	Benthic habitats and associated communities	**AL-20:** No introduction and establishment of an invasive marine pest attributable to the Development.
Unplanned releases–solid waste	Marine mammals	**AL-21:** (see above)
	Marine reptiles	
	Fishes, including sharks and rays	
	Seabirds and shorebirds	
Unplanned releases–leaks and spills	Marine mammals	**AL-22:** No minor loss of containment of hydrocarbons or chemicals to the environment from the Development
	Marine reptiles	
	Fishes, including sharks and rays	
Unplanned releases–loss of containment (vessel collision)	Marine mammals	**AL-23**: No unplanned release of hydrocarbons to the environment from the Development
	Marine reptiles	
	Fishes, including sharks and rays	
	Seabirds and shorebirds	
	Coastal communities and habitats associated	
	KEFs	
	AMPs	
	Commercial fisheries	
	Tourism and recreation	
	Underwater cultural heritage	
	Listed heritage places	
Unplanned releases–loss of	Marine mammals	**AL-23**: No unplanned release of hydrocarbons to the environment from the Development
	Marine reptiles	

Aspect	Environmental value or sensitivity	Acceptable level(s)[38],[39]
containment (LOWC)	Fishes, including sharks and rays	
	Seabirds and shorebirds	
	Benthic habitats and associated communities	
	Coastal communities and habitats associated	
	KEFs	
	AMPs	
	Commercial fisheries	
	Tourism and recreation	
	Underwater cultural heritage	
	Listed heritage places	
Oil spill response–dispersant use	Benthic habitats and associated communities	**AL-23** (see above)
	Marine mammals	
	Marine reptiles	
	Fishes, including sharks and rays	
	Seabirds and shorebirds	
Oil spill response–shoreline	Coastal communities and habitats associated	**AL-23** (see above)
	Marine reptile	
	Seabirds and shorebirds	
Oil spill response–oiled wildlife	Marine mammals	**AL-23** (see above)
	Marine reptiles	
	Fishes, including sharks and rays	
	Seabirds and shorebirds	
Planned activities and/or unplanned events		
Cultural heritage–intangible values	Sea Country	**AL-07**: No interference with known Sea Country values (as identified from engagement with First Nations peoples) to a greater extent than is necessary for the reasonable exercise of the rights and performance of duties as conferred to the titleholder

6.7 Demonstration of acceptability

6.7.1 comparison with acceptable level

The predicted level of environmental impact and risk will be evaluated against the defined acceptable level(s) to determine if they can be met, or if additional management (e.g. additional control measures) may be required to further reduce

the predicted level of impact or risk so that they do not exceed the acceptable level(s) (Ref. 22).

6.7.2 Principles of ESD

The principles of ESD are considered in Table 6-4 in relation to acceptability demonstration.

Under the EPBC Act, the decision-maker must also consider the precautionary principle in determining whether to approve the taking of an action. The precautionary principle (section 391(2) of the EPBC Act) "is that lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment where there may be threats of serious or irreversible environmental damage".

Table 6-4: Principles of ESD in relation to petroleum activity acceptability demonstration

Principles of ESD	How they have been applied
Integration Principle (a) decision-making processes should effectively integrate both long-term and short-term economic, environmental, social, and equitable considerations	CAPL's impact and risk assessment process integrates long-term and short-term economic, environmental, social, and equitable considerations. This is demonstrated through the *Integrated Risk Prioritization Matrix* (Table 6-2), which includes provision for understanding the long-term and short-term impacts associated with its activities, and the ALARP process for mitigating and managing environmental impacts and risks. The impact and risk assessment process also provides for, and integrates any matters raised during relevant persons consultation into the evaluation of impacts and risks. As this principle is inherently met by applying the assessment process, it is not considered separately for each aspect's impact and risk evaluation
Precautionary Principle (b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation	CAPL considers if there is the potential for serious or irreversible environmental damage by assigning these as equivalent to a consequence level between Severe (2) and Catastrophic (1) from the Integrated Risk Prioritization Matrix (Table 6-2). Where a potential for serious or irreversible environmental damage is identified, then CAPL assess whether there is a lack of full scientific certainty associated with the aspect. Then, if there is a lack of full scientific certainty, CAPL will use a precautionary approach to implement control measures to avoid or reduce the threat of serious or irreversible environmental damage
Intergenerational Principle (c) the principle of inter-generational equity – that the present generation should ensure that the health, diversity, and productivity of the environment is maintained or enhanced for the benefit of future generations	The impact and risk assessment process ensures that impacts and risks are reduced to levels that are considered ALARP and acceptable. CAPL considers if there is the potential to affect the maintenance of health, diversity, and productivity of the environment; by determining if there is potential for serious or irreversible environmental damage by assigning these as equivalent to a consequence level between Severe (2) and Catastrophic (1) from the Integrated Risk Prioritization Matrix (Table 6-2). Where a potential for serious or irreversible environmental damage is identified, then the Precautionary Principle is implemented to ensure that impacts and risks are managed to ensure that the environment is maintained for the benefit of future generations

Principles of ESD	How they have been applied
Biodiversity Principle (d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making	The impact and risk assessment process ensures that impacts and risks are reduced to levels that are considered ALARP and acceptable. CAPL will consider if there is the potential to affect biological diversity and ecological integrity
Valuation Principle (e) improved valuation, pricing, and incentive mechanisms should be promoted	Not considered relevant for petroleum activity acceptability demonstration

6.7.3 Legislative and other requirements

This acceptability criterion includes a review of legislative or other requirements relevant to the environmental management of the petroleum activity.

Matters protected under Part 3 of the EPBC Act are also considered under this acceptability criterion such that impacts and/or risks are consistent with relevant statutory instruments made or adopted under the EPBC Act (e.g. threatened species recovery plans, AMP management plans

6.7.4 Internal context

This acceptability criterion includes a review of the environmental aspect against requirements under CAPL's management systems to ensure that environmental impact and risk management is consistent with company policy, culture, and standards.

6.7.5 External context

The impact and risk assessment process is informed by relevant persons consultation (Section 7). This acceptability criterion includes a review of any objections or claims raised for an environmental aspect to ensure that these were considered.

6.7.6 Summary of acceptance criteria

Table 6-5 outlines the criteria that CAPL use to demonstrate that potential impacts and risks from each environmental aspect are acceptable.

Table 6-5: Acceptability criteria

Criteria	Test
Acceptable level(s)	Confirm that the predicted level of impact or risk can be managed to achieve the defined acceptable level(s) for that environmental aspect
Principles of ESD	Confirm that the predicted level of impact or risk is consistent with the ESD principes (b), (c), and (d) as per Table 6-2.
Relevant requirements	Confirm that impact and risk management is consistent with relevant Australian environmental management laws and other regulatory or statutory requirements
Internal context	Confirm that impact and risk management is consistent with CAPL's management systems, company policy, culture, and standards
External context	Consider any objections or claims raised during relevant persons consultation, and how these were addressed

6.8 Environmental performance

CAPL is committed to conducting the petroleum activity in an environmentally responsible manner and aims to implement best practice environmental management as part of a program of continual improvement to reduce impacts and risks to ALARP and acceptable levels.

Regulation 21(7) of the OPGGS(E)R requires an EP to set out **environmental performance outcomes** (EPOs) and **environmental performance standards** (EPSs) for managing the environmental performance of the petroleum activity. The OPGGS(E)R defines EPOs and EPSs as

- EPO—means a measurable level of performance required for the management of environmental aspects of the activity to ensure that environmental impacts and risks of the activity will be of an acceptable level
- EPS—means a statement of the performance required of a control measure.

The OPGGS(E)R also requires that an EP include **measurement criteria** (MC) that the titleholder will use to determine whether each EPO and EPS is being met

For EPs submitted subsequent to an OPP, the EPOs must be consistent (i.e. need to achieve the same (or better) environmental outcome) with those set out in this OPP (Ref. 18; Ref. 22). A concordance table for EPOs from the Gorgon Backfill Fields Development OPP that are relevant to the petroleum activity within this EP[46] are summarised in Appendix B.

[46] Where relevant, EPO numbering is consistent with the Backfill Fields Development OPP (Ref. 3).

7 Relevant persons consultation

This section provides a description of the methods used, and outcomes of, consultation with relevant authorities, persons, or organisations (a relevant person) undertaken during the preparation of this EP, as required under regulation 25 of the OPGGS(E)R.

Ongoing consultation, as required under regulation 22(15) of the OPGGS(E)R, is described in Section 10.3.4.

7.1 Purpose

Regulation 25 of the OPGGS(E)R allows the titleholder to properly understand all the environmental impacts and risks of the petroleum activity and enables the titleholder to refine or change the control measures by taking into account the information acquired from relevant persons through consultations. Recent judicial consideration of regulation 25 assists in understanding the purpose of the consultation required under the provision:

> *"Regulation 25, like most statutory consultation provisions, imposes an obligation that must be capable of practicable and reasonable discharge by the person upon whom it is imposed. Consultation is a "real world" activity, with specific purposes. Here, its purpose is to ensure that the titleholder has ascertained, understood and addressed all the environmental impacts and risks that might arise from its proposed activity. Consultation facilitates this outcome because it gives the titleholder an opportunity to receive information that it might not otherwise have received from others affected by its proposed activity. Consultation enables the titleholder to better understand how others with an objective stake in the environment in which it proposes to pursue the activity perceive those environmental impacts and risks. As the Regulations expressly contemplate, it enables the titleholder to refine or change the measures it proposes to address those impacts and risks by taking into account the information acquired through the consultations. Objectively, the scheme intends that this is likely to improve the minimisation of environmental impacts and risks from the activity."*[47]

The consultation process should also inform the titleholder's understanding of the environment, including (amongst other things) people and communities, the heritage value of places, and their social and cultural features which may be affected by a titleholder's proposed activities (Ref. 164). The purpose of consultation is also to:

- identify the social and cultural features of communities within the ecosystem
- inform the control measures to avoid or reduce impacts and risks to those socio-cultural values and sensitivities in response to relevant persons concerns
- demonstrate to NOPSEMA that consultation has been carried out to inform NOPSEMA of relevant persons' identities, the nature of the consultation, and that the control measures adopted are both 'appropriate' and comply with legislation (Ref. 166 at paragraphs 55–57, and Ref. 165 at paragraph 48).

[47] Paragraph 89 of *Santos NA Barossa Pty Ltd v Tipakalippa [2022] FCAFC 193* (Ref. 166). Note: The regulation number in the above text has been revised to reflect the OPGGS(E)R 2023, from the original *Santos NA Barossa Pty Ltd v Tipakalippa [2022] FCAFC* judgement transcript.

In particular, the details of the potential environmental impacts and risks of the activities cannot be ascertained unless the environment that may be affected by the activity is known, which includes an understanding of the social, economic and cultural features of the environment (Ref. 168 at paragraph 11).

In essence, the purpose of consultation is to enhance environment plans through the incorporation of input from relevant persons during consultation.

Regulation 25 establishes an obligation on titleholders to carry out consultation with relevant persons during preparation of an EP, and this obligation must be discharged prior to submitting an EP to NOPSEMA (Ref. 164).

Consultation is undertaken in the course of preparing an EP (Ref. 164). Once consultation has been closed prior to finalising and submitting an EP, further consultation (including consultation during the assessment of the EP) is considered as contributing to discharging the ongoing consultation obligations in regulation 22(15) (see Section 10.3.4). This is because if the EP is in the assessment phase, any further consultation is no longer 'in the course of preparing an EP' for the purposes of regulation 25.

7.2 Regulatory guidance

The consultation design for preparation of this EP was undertaken in accordance with *CAPL's Stakeholder Engagement and Issues Management Process: Standardised OE Process* (Ref. 186) and further guided by:

- NOPSEMA's *Environment plan decision making guideline* (Ref. 163)
- NOPSEMA's *Environment plan content requirements guidance note* (Ref. 22)
- NOPSEMA's *Consultation in the course of preparing an environment plan guideline* (Ref. 164)
- NOPSEMA's *Consultation with Commonwealth agencies with responsibilities in the marine area guideline* (Ref. 169)
- NOPSEMA's *Petroleum activities and Australian Marine Parks guidance note* (Ref. 165)
- Full Court of the Federal Court of Australia's decision in *Santos NA Barossa Pty Ltd v Tipakalippa [2022] FCAFC 193* (Ref. 166)
- Colvin J of the Federal Court in *Cooper v National Offshore Petroleum and Safety Management Authority [2023] FCA 1112* (Ref. 170)
- Colvin J of the Federal Court in *Cooper v National Offshore Petroleum and Safety Management Authority (No 2)* [2023] FCA 1158 (Ref. 168)
- Commonwealth of Australia's Interim Engaging with First Nations People and Communities on Assessments and Approvals under the EPBC Act 1999 (Ref. 167)
- Government of WA's *Consultation policy for Section 18 application* (Ref. 171)
- WA Department of Energy, Mines, Industry Regulation and Safety (DMIRS) *Guideline for the Development of Petroleum, Geothermal and Pipeline Environment Plans in Western Australia* (Ref. 172)
- Australian Fisheries Management Authority's (AFMA) *Petroleum industry consultation with the commercial fishing industry* (Ref. 173)

- Western Australian Fishing Industry Council's (WAFIC) *Oil & Gas Consultation Approach for Unplanned Events* (Ref. 174)
- DPIRDs *Guidance statement for oil and gas industry consultation with the Department of Fisheries* (Ref. 175)
- WA Department of Transport's (DoT) *Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements* (Ref. 176).

7.3 Consultation principles

Consistent with NOPSEMA's *Consultation in the course of preparing an environment plan guideline* (Ref. 164), CAPL conducts consultation consistently with the following key principles:

- **effective**: CAPL as titleholder is responsible for running an effective consultation process that meets the OPGGS(E)R
- **timely**: sufficient time will be allocated for consultation and for the provision of sufficient information to relevant persons. Relevant persons engagement is encouraged to take place early during the development of an EP with the timing and frequency guided by the nature and scale of the petroleum activity, environmental risks and impacts of the activity, Hydrocarbon EMBA, and co-design of consultation with relevant persons
- **communication**: titleholders are responsible for letting potential relevant persons know if they may be affected by an activity, giving relevant persons an opportunity to identify as such, and the process for making comments, and for providing sufficient information (including information that is accurate and relevant). Relevant persons are expected to identify their function, activity or interest that may be affected, communicate their requirements and availability regarding consultation co-design, and provide comment on how their function, activity or interest may be affected. Communication with relevant persons should be open, accurate, accessible, clearly-defined and two-way. Relevant objections and claims from relevant persons must be used to inform risk assessments and control measures
- **transparent and accountable**: the process and outcomes of relevant persons engagement should, wherever possible, be open and transparent. NOPSEMA will receive all copies of consultation correspondence (or in the case of face-to-face consultation, then consultation summaries or meeting minutes or equivalent) in the EP. CAPL will respect cultural concerns in providing copies of consultation correspondence in the EP, including engaging with NOPSEMA to share gender-specific information with the appropriate gender and not sharing culturally sensitive information at the relevant person's request. CAPL is accountable for ensuring that the EP complies with EP acceptance criteria in regulation 34 so that NOPSEMA can be reasonably satisfied that the EP should be accepted under regulation 33
- **clear and sufficient**: sufficient information must be provided to relevant persons, and it should be simple, clear, and accurate. CAPL should avoid providing unnecessarily detailed and technical information unless of particular relevance to a relevant person (e.g. other titleholder) or requested by the relevant person. CAPL must give relevant persons sufficient time to respond to requests for consultation and provide comment on the information provided.

Relevant persons have a right to request additional information in order to determine how they might be affected

- **collaboration**: a collaborative approach is key to effective engagement, and may include working with representative organisations to help reduce 'consultation fatigue', and relevant persons working with industry to provide evidence of how their function, interest, or activities may be affected
- **inclusiveness**: identify and involve relevant persons early and throughout the process
- **integrity**: engagement with relevant persons should aim to establish and foster mutual trust and respect (even in cases where relevant persons oppose a petroleum activity)
- **scalability**: consultation should be scalable based on the nature and scale of the petroleum activity, Hydrocarbon EMBA, the impacts and risks of the activity, the likelihood of the risks, and how familiar relevant persons are with petroleum activities based on past consultation on similar petroleum activities (e.g. location).

7.4 Consultation process for this EP

The consultation undertaken during the preparation of this EP used the following process (Figure 7-1):

- described the petroleum activity
- identified environmental aspects
- defined the Hydrocarbon EMBA and identified environmental values and sensitivities
- evaluated environmental impacts and risks and demonstrated these are reduced to ALARP and acceptable levels
- identified functions, interests, or activities that may be affected
- identified relevant persons
- undertook consultation, including co-design of consultation and provision of sufficient information to enable relevant persons to understand how this activity may affect their functions, interests, or activities
- assessed the merit of any objections or claims raised by the relevant persons, and, if appropriate, incorporated information from consultation in this EP to enhance the EP (through description of additional values and sensitivities, update to the risk assessment, additional control measures, addition information in the implementation strategy regarding capacity building for emergency response etc., as appropriate)
- provided a response to the objection or claim, and ensured the response was captured in the EP.

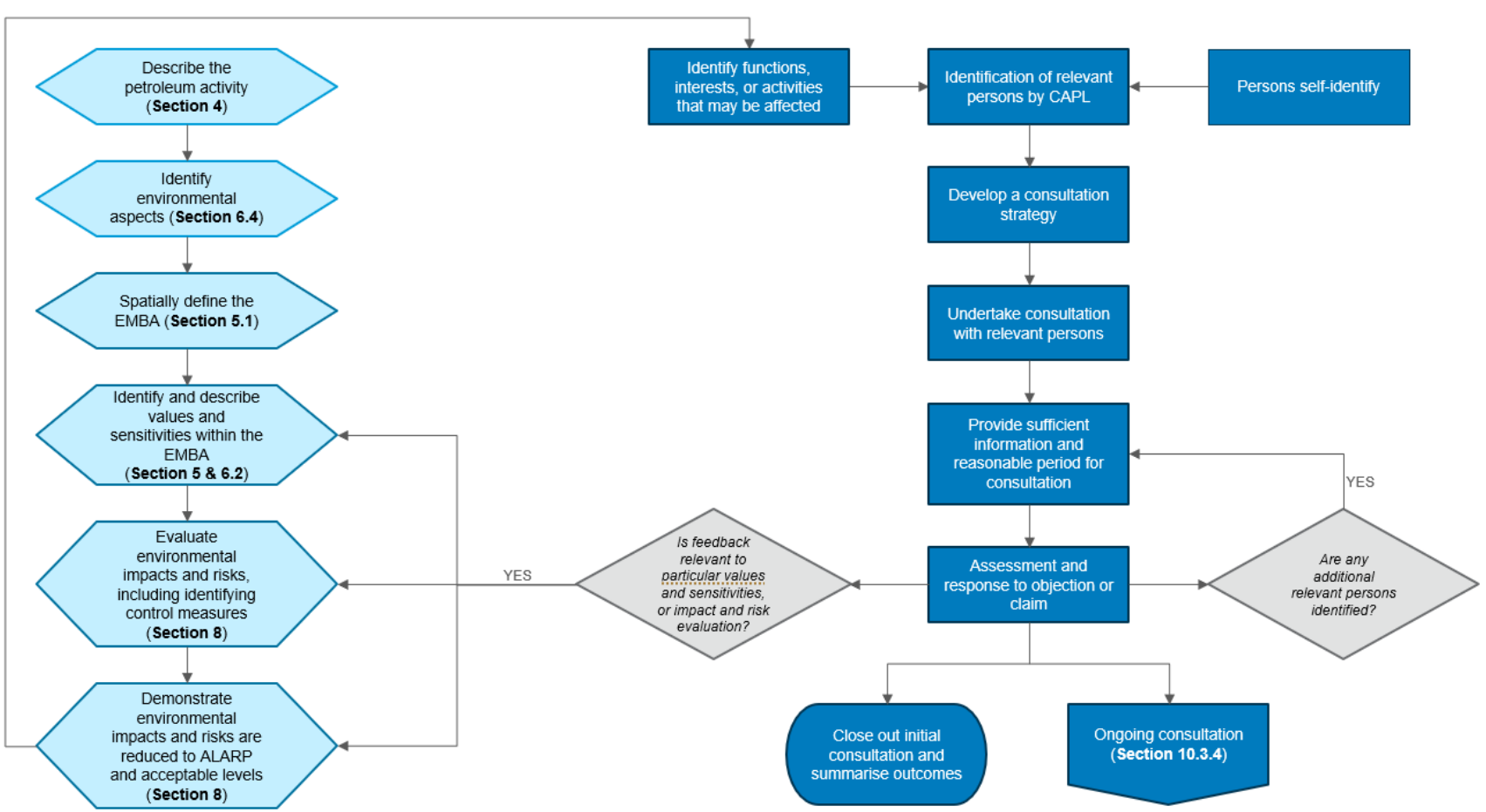


Figure 7-1: Relevant persons consultation process

7.5 Identification of relevant persons

In accordance with NOPSEMA's guideline for consultation (Ref. 164), titleholders must identify who is a relevant person as defined by regulations 25(1)(a)-(e) of the OPGGSER and the rationale used to determine that identification as a relevant person. CAPL has a process to identify and 'screen in' potential relevant persons and also provides for self-identification.

CAPL achieved this in two ways, first by an assessment process supported by research and historical consultation and advice, secondly by providing an opportunity for those who may not have been identified through the assessment process to self-identify.

Identifying relevant persons requires an assessment of:

- the petroleum activity (Section 4)
- the environment in which the petroleum activity is being undertaken, including:
  - environmental, socio-economic, and cultural values and sensitivities of the environment
  - the spatial extent of the Hydrocarbon EMBA
  - any intersection between the Hydrocarbon EMBA and BIAs.
- the potential environmental impacts and risks of the petroleum activity and the possible consequences on the functions, interests, activities of relevant persons.

The process undertaken by CAPL for the identification of relevant persons:

- identified what types of authorities, persons, or organisations may be relevant to the values and sensitivities present within the Hydrocarbon EMBA
- reviewed the functions, interests, or activities of the types of organisations or individuals identified, and determined if the functions, interests, or activities of organisations or individuals may be affected by the petroleum activity through multiple lines of evidence:
  - existing industry guidance (e.g. Ref. 165; Ref. 169; Ref. 173; Ref. 174; Ref. 175; Ref. 176)
  - online searches
  - review of publicly available databases or registers (e.g. access and use authorisations within AMPs, DPIRD's register of fishery licence holders)
  - historical consultation and advice
    - CAPL's previous identification of relevant persons for consultation history for an extensive history of multiple prior petroleum activities on the NWS within the Hydrocarbon EMBA and in the same geographic area
    - advice from representative industry organisations, community organisations and representative organisations for Traditional Custodians.

The outcomes of this process are detailed in Table 7-1, which lists the categories of relevant persons that were identified for this EP, and CAPL's reasoning for determining their inclusion. Table 7-3 identifies the specific persons or

organisations within these categories who were ultimately identified as relevant persons and consulted with for this EP.

In addition to this process, individuals and organisations were also given the opportunity to self-identify as relevant persons, which is further outlined in Section 7.5.6. Where individuals or organisations have been identified as relevant persons for previous petroleum activities, but fall outside the Hydrocarbon EMBA and are not relevant persons for this activity under regulation 25(1)(d), CAPL may consider them relevant persons under regulation 25(1)(e) (see Section 7.5.5).

Table 7-1: Potential authority, persons, or organisations that have functions, interests, or activities that are associated with environmental values or sensitivities present within the Hydrocarbon EMBA

Environmental aspect (and aspect source)	Values and sensitivities	Function, interest, or activity	Potential impact or risk	Intersection	Category of persons or organisations
Physical presence – vessels, infrastructure and/or equipment • long-term presence of subsea infrastructure • temporary presence of MODU, vessels and ROV/AUV	Commercial fishing	Interest and activity – Commercial fishing	Potential for unplanned interactions due to entanglement of trawl fishing gear with the wellhead or subsea equipment. Temporary presence of MODU, vessels and ROV/AUV have the potential to result in a change to the functions, interests, and activities to fishing vessels.	The subsea infrastructure associated with this activity is contained wholly within the OA. Although Commonwealth and State fisheries are present, the level of fishing effort within the OA is typically low (refer to Section 5.4.1). The temporary presence of vessels within the OA is not expected to significantly affect commercial fishers, however it is acknowledged there may be an intersection with commercial fishing and the OA.	Commercial fishery licence holders and/or representative bodies Government departments or agencies.
	Commercial shipping	Interest and activity – Commercial shipping	Temporary presence of MODU, vessels and ROV/AUV have the potential to result in a change to the functions, interests, and activities to shipping vessels.	The OA is located outside major shipping fairways, and commercial vessel traffic is expected to remain within the fairways and, therefore will not typically coincide with the OA (Section 5.4.4). Therefore, the temporary presence of the vessels within the OA are not expected to significantly affect the functions, interests or activities of commercial shipping. Notwithstanding, there may be an intersection with commercial shipping activities within the OA.	Commercial shipping industry Government departments or agencies
Seabed disturbance • installation of subsea equipment and contingency activities • IMR (contingency) –as required by	Marine environmental quality BCH Cultural values	Interest and activity – Environmental conservation Cultural values, activities and obligations	Localised and temporary change in water quality Localised alteration of BCH	The petroleum activity may result in a localised reduction in water quality around the area of seabed disturbance. The OA is primarily comprised of smooth seabed with bioturbation and scattered patches of bedforms with bare substrate (Section 5.3.1.1) and	Government departments or agencies First Nations people and/or representative bodies

Environmental aspect (and aspect source)	Values and sensitivities	Function, interest, or activity	Potential impact or risk	Intersection	Category of persons or organisations
maintenance and repair activities (e.g. well intervention) • MODU positioning due to the temporary presence of transponders and clump weight (if used) on the seabed • temporary ROV/AUV wet parking and vessel anchoring during emergencies.			Potential adverse effects to unknown UCH sites and/or artefacts.	does not overlap any KEFs. Seabed disturbance is expected to be highly localised. No known protected UCH sites or artefacts have been identified within the OA. Notwithstanding it is acknowledged that that relevant persons may hold interests relating to marine environmental quality, BCH and cultural values, in particular with respect to the protection of Sea Country.	ENGOs
Atmospheric emissions • contingency activities during drilling and completions, and IMR, including flaring and venting • combustion of fuel from planned MODU, vessels, and helicopter activities.	Air quality	Interest and activity – Environmental conservation	A localised and temporary reduction in air quality	As reduction in air quality will be temporary and highly localised, and as the potential impact of the contribution of petroleum activity GHG emissions to the potential reduction of IPCC's estimated remaining carbon budget for a 50% likelihood to limit global warming to 1.5–2.0°C has been evaluated as having the potential to result in an Incidental (6) consequence, It is not expected that the functions, interests or activities of relevant persons will be affected. However, it is acknowledged that relevant persons may hold interests relevant to this aspect.	Government departments or agencies ENGOs
GHG emissions • contingency activities during drilling and completions, and	Marine environmental quality	Interest and activity – Environmental conservation	Potential reduction to IPCC's estimated 'remaining carbon budget' to limit global warming to 1.5–2.0°C		

Environmental aspect (and aspect source)	Values and sensitivities	Function, interest, or activity	Potential impact or risk	Intersection	Category of persons or organisations
IMR, including flaring and venting • combustion of fuel from vessels, MODU and helicopters.					
Light emissions • navigational and operational lighting from MODU and vessels • flaring during contingency well intervention activities.	Marine environmental quality Marine fauna	Interest and activity – Environmental conservation	A localised and temporary change in ambient light. Potential change in behaviour of marine fauna.	The activities may result in temporary changes to ambient light with light returning to ambient levels following the cessation of the petroleum activity. The wedge-tailed shearwater breeding BIA is the only BIA identified for light-sensitive species within the OA. The OA is located ~75 km from the nearest coast. Given that artificial light exposure area is expected to extend ~8.8 km from the MODU during drilling (or well intervention) activities, and ~14.3 km from the MODU during flaring, exposure of nesting adult birds or fledglings to artificial light emissions from the activity will not occur at breeding colonies. However, potential impacts may occur to transient adult individuals. As such, it is acknowledged that relevant persons may hold interests relevant to the values and sensitivities that may be impacted by this aspect.	Government departments or agencies ENGOs
Underwater sound • drilling operations • acoustic surveys associated with IMR activities	Marine environmental quality Marine fauna	Interest and activity – Environmental conservation	A localised and temporary change in ambient underwater sound. Potential change in behaviour of marine fauna	The activities may result in localised and temporary change in ambient underwater sound with soundscape returning to ambient levels upon completion of the activity. The pygmy blue whale migration BIA is the only BIA that overlap with the OA.	Government departments or agencies ENGOs

Environmental aspect (and aspect source)	Values and sensitivities	Function, interest, or activity	Potential impact or risk	Intersection	Category of persons or organisations
• use of of acoustic positiong equipment • MODU, vessel, ROV/AUV and helicopter operations.			Potential auditory impairment or injury to marine fauna.	The worst-case consequence of sound emissions resulting in either a change in the behaviour or localised masking effects of up to a small proportion of the migrating pygmy blue whale population and this subsequently causing a reduction in fitness due to deviations in migratory path or disturbance of an opportunistic foraging event, has been assessed as Minor (5) as the individuals are expected to recover in the short-term and with no long-term effect on population viability. Notwithstanding, it is acknowledged that relevant persons may hold interests relevant to the values and sensitivities that may be impacted by this aspect.	
Planned discharges – MODU and vessel discharges • MODU and vessels operations within the OA during the petroleum activity.	Marine environmental quality Marine fauna	Interest and activity – Environmental conservation	A localised and temporary change in water quality. Potential change in behaviour of marine fauna.	Impacts and risks associated with planned discharges from MODU and vessels are expected to be limited to close to the release location and temporary in nature. It is unlikely the functions and activities of relevant persons would be impacted by these planned discharges; however, relevant persons may hold interests relevant to the values and sensitivities that may be impacted by this aspect.	Government departments or agencies
Planned discharges – drilling operations • production well drilling and completions	Marine environmental quality Sediment quality BCH	Interest and activity – Environmental conservation	A localised and temporary change in water quality. A localised and temporary change in sediment quality Alteration of BCH	Impacts and risks associated with drilling related discharges are expected to be limited to close to the release location and/or temporary in nature. It is unlikely the functions and activities of relevant persons would be impacted by these planned discharges; however,	Government departments or agencies

Environmental aspect (and aspect source)	Values and sensitivities	Function, interest, or activity	Potential impact or risk	Intersection	Category of persons or organisations
• contingency well intervention.	Marine fauna		Potential adverse effects to marine fauna.	relevant persons may hold interests relevant to the values and sensitivities that may be impacted by this aspect.	
Unplanned disturbance—fauna interaction • temporary presence of MODU, vessels, helicopters and ROV/AUV within the OA	Marine fauna	Interest and activity – Environmental conservation	Unplanned interactions with marine fauna resulting in injury or mortality of marine fauna	The following BIAs were identified overlapping with the OA: • pygmy blue whale migration BIA • wedge-tailed shearwater breeding BIA. Fauna strikes are not expected due to the low numbers of transitory marine fauna, the limited vessel numbers within the OA, and the fact that fauna strikes have been demonstrated to be very rare. Similarly, given the low frequency of helicopter flights within the OA and the low speeds during take-off or landing, the risk of bird strike from helicopters is also expected to be limited. If a fauna strike occurred leading to mortality, it would result in individual impacts and is not expected to have a detrimental effect on the overall population; this event would result in a Minor (5) environmental consequence. However, it is acknowledged that relevant persons may hold interests relating to the protection of marine fauna.	Government departments or agencies ENGOs
Unplanned disturbance – seabed disturbance • dropped objects from the MODU, vessels or ROV/AUV during drilling activities.	BCH Cultural values	Interest and activity – Environmental conservation Cultural values, activities and obligations	Temporary alteration of BCH A potential adverse effect to unknown UCH sites and/or artefacts.	The potential impacts to BCH as a result of unplanned seabed disturbance would be limited to individual occurrences and short-term localised impacts. There are no known UCH within the OA, and the probability of encountering	Government departments or agencies First Nations people and/or representative bodies ENGOs

Environmental aspect (and aspect source)	Values and sensitivities	Function, interest, or activity	Potential impact or risk	Intersection	Category of persons or organisations
				any historic UCH is low. Notwithstanding it is acknowledged that that relevant persons may hold interests relating to marine environmental quality, BCH and cultural values, in particular with respect to the protection of Sea Country.	
Non-indigenous species—introduction of invasive marine pests • planned discharged of ballast water or the presence of biofouling on MODU and vessels undertaking activities within the OA • presence of biofouling on subsea equipment used within the OA	BCH	Interest and activity – Environmental conservation	Alteration to BCH	The OA occurs in deep water >1,100 m and is located ~75 km from the closest island (Montebello Island), and >180 km from the mainland and large ports. The BCH is primarily comprised of smooth seabed. Thus, the more favourable requirements of expansive hard substrate and sufficient light for invasive marine pest survival are not common within the OA. Although it is highly unlikely the activities in this EP would result in the introduction of invasive marine pests, once established, invasive marine pests can be difficult to eradicate and therefore there is the potential for a long-term change in habitat structure. As a result, relevant persons may hold interests relevant to the values and sensitivities that may be impacted by this aspect.	Government departments or agencies ENGOs
Unplanned release–solid waste • inappropriately handled or stored solid waste onboard MODU and vessels	Marine fauna	Interest and activity – Environmental conservation	Injury or mortality of marine fauna.	Unplanned releases of solid waste may result in potential injury or mortality to individual marine fauna. It is unlikely the functions and activities of relevant persons would be impacted by an unplanned release of waste; however, relevant persons may hold interests	Government departments or agencies

Environmental aspect (and aspect source)	Values and sensitivities	Function, interest, or activity	Potential impact or risk	Intersection	Category of persons or organisations
operating within the OA during the petroleum activity.				relevant to the values and sensitivities that may be impacted by this aspect.	
Unplanned release–leaks and spills • using, handling, and transferring hazardous materials and chemicals on board • transferring marine fuel or chemicals between MODU and vessels • hydraulic line failure from equipment • emergency disconnect • slip joint packer failure.	Marine environmental quality Marine fauna	Interest and activity – Environmental conservation	Localised and temporary reduction in water quality Potential adverse effects to marine fauna	Based on the nature of the unplanned release–leaks and spills scenarios considered credible in this EP, the extent and severity of any potential impact is expected to be spatially and temporally limited. It is unlikely the functions and activities of relevant persons would be impacted by these unplanned releases; however, relevant persons may hold interests relevant to the values and sensitivities that may be impacted by this aspect.	Government departments or agencies ENGOs
Unplanned release—loss of containment (vessel collision) • a collision could potentially occur between the MODU/vessels undertaking the petroleum activity and/or third-party vessels.	Marine environmental quality BCH Marine fauna Commercial fishing Tourism and recreation	Interest and activity – Environmental conservation Cultural values, activities and obligations Commercial fishing Commercial shipping Recreational fishing Marine recreation	Change in water quality Potential adverse effects to BCH Potential adverse effects to marine fauna Potential changes to the functions, interests and activities of other marine users	Although highly unlikely, an unplanned event resulting in a hydrocarbon spill due to a vessel collision may affect the functions, interests and activities of relevant persons within the spatial extent of the Hydrocarbon EMBA. Refer to Section 5.1 for information on the Hydrocarbon EMBA.	Government departments or agencies First Nations people and/or representative bodies WA World Heritage advisory committees ENGOs Commercial fishery licence holders

Environmental aspect (and aspect source)	Values and sensitivities	Function, interest, or activity	Potential impact or risk	Intersection	Category of persons or organisations
	Marine protected areas World heritage properties National heritage places Tangible cultural heritage values	Petroleum exploration / production	Potential changes to values and sensitivities of protected areas Potential changes to tangible cultural heritage values		and/or representative bodies Commercial shipping industry Tourism and recreation operators Other petroleum titleholders Submarine cable operators Research organisations
Unplanned release–LOWC • a LOWC may occur due to unplanned hydrocarbon influx, breach of well fluids, or loss of hydrostatic barrier during drilling, well intervention and/or well abandonment activities.	Marine environmental quality Sediment quality BCH Coastal communities and habitats Marine fauna Commercial fishing Tourism and recreation Marine protected areas World heritage properties	Interest and activity – Environmental conservation Cultural values, activities and obligations Commercial fishing Commercial shipping Recreational fishing Marine recreation Petroleum exploration / production	Change in water quality Change in sediment quality Potential adverse effects to BCH Potential adverse effects to coastal communities and habitats Potential adverse effects to marine fauna Potential changes to the functions, interests and activities of other marine users Potential changes to values and sensitivities of protected areas Potential changes to tangible cultural heritage values	Although highly unlikely, an unplanned event resulting in a hydrocarbon spill due to a LOWC may affect the functions, interests and activities of relevant persons within the spatial extent of the Hydrocarbon EMBA. Refer to Section 5.1 for information on the Hydrocarbon EMBA.	Government departments or agencies First Nations people and/or representative bodies WA World Heritage advisory committees ENGOs Commercial fishery licence holders and/or representative bodies Commercial shipping industry Tourism and recreation operators Other petroleum titleholders Submarine cable operators

Environmental aspect (and aspect source)	Values and sensitivities	Function, interest, or activity	Potential impact or risk	Intersection	Category of persons or organisations
	National heritage places Tangible cultural heritage values				Research organisations
Oil spill response—dispersant use	BCH Marine fauna	Interest and activity – Environmental conservation	Potential adverse effects to BCH Potential adverse effects to marine fauna	Chemical dispersant application has the potential to result in temporarily increase in oil concentrations in the water column. Chemical dispersant application will only be undertaken where there is likely to be a net benefit and therefore the functions, interests and activities of relevant persons are unlikely to be affected.	Government departments or agencies
Oil spill response—shoreline spill response	Coastal communities and habitats	Interest and activity – Environmental conservation	Potential adverse effects to coastal communities and habitats.	Shoreline protection and deflection and clean-up activities have the potential to result in short-term and localised damage to or alteration of habitats and ecological communities. Shoreline activities will only be undertaken where there is likely to be a net benefit and therefore the functions, interests and activities of relevant persons are unlikely to be affected.	Government departments or agencies
Oil spill response—oiled wildlife response	Marine fauna	Interest and activity – Environmental conservation	Potential adverse effects to oiled and/or unoiled fauna.	The intensive nature of oil wildlife response activities and the fragile nature of many shore and wading birds, may cause behaviour, distribution and incidental bird mortality; however, will only be undertaken where there is likely to be a net benefit and therefore the functions,	Government departments or agencies

Environmental aspect (and aspect source)	Values and sensitivities	Function, interest, or activity	Potential impact or risk	Intersection	Category of persons or organisations
				interests and activities of relevant persons are unlikely to be affected.	
Cultural heritage—intangible values	Cultural values	Cultural values, activities and obligations	Activities undertaken during the petroleum have the potential to result in interference with Sea Country values (intangible cultural heritage), including songlines, dreaming stories, and culturally important marine fauna.	Impacts and risks associated with the aspects previously identified have the potential to impact intangible cultural heritage. They have been assessed as lower-order impacts and risks, that are ALARP and acceptable with suitable controls in place. However, it is acknowledged that relevant persons may hold interests relevant to this aspect.	First Nations people and/or representative bodies

7.5.1 Relevant persons under regulation 25(1)(a)

In accordance with the OPGGS(E)R, relevant persons include the Commonwealth and State departments or agencies to which activities under this EP may be relevant (Section 7.4).

CAPL determined relevant persons under these regulations by considering:

- the spatial extent of the Hydrocarbon EMBA
- the environmental aspects, and potential environmental impacts and risks associated with the petroleum activity
- the responsibilities of the Commonwealth or State department or agency, which was determined by:
  - CAPL's previous consultation history for petroleum activities on the NWS
  - online searches
  - published guidance, including NOPSEMA's *Consultation with Commonwealth agencies with responsibilities in the marine area guideline* (Ref. 169).

The Commonwealth and State departments or agencies that were identified as a relevant person for consultation during the preparation of this EP are presented in Table 7-3.

7.5.2 Relevant persons under regulation 25(1)(b)

In accordance with the OPGGS(E)R, the department or agency of the responsible State Minister is a relevant person (Section 7.4).

The petroleum activity within scope of this EP occurs in Commonwealth waters, off the coast of WA. As such, the Department of Mines, Petroleum and Exploration (DMPE) has been identified as a relevant person for consultation during the preparation of this EP (Table 7-3).

7.5.3 Relevant persons under regulation 25(1)(c)

In accordance with the OPGGS(E)R, if the petroleum activity occurs in the Principal NT offshore area, the department of the responsible NT Minister is a relevant person.

The petroleum activity within the scope of this EP occurs in Commonwealth waters, off the coast of WA. As such, NT department has not been identified as a relevant person for consultation during the preparation of this EP.

7.5.4 Relevant persons under regulation 25(1)(d)

In accordance with the OPGGS(E)R, relevant persons include a person or organisation whose functions, interests or activities may be affected by the activities under this EP. The considerations for determining the relevance of a person or organisation are described below and Table 7-2.

In accordance with regulation 25(1) of the OPGGS(E)R, and following the direction given by the Full Court of the Federal Court in *Santos NA Barossa Pty Ltd v Tipakalippa [2022] FCAFC 193* (Ref. 166), and subsequent NOPSEMA guidance (Ref. 22), it is clear that the phrase "functions, interests or activities"

stated in regulation 25(1)(d) should be broadly construed[48] on the basis that a broad construction best promotes the objects of the OPGGS(E)R. In *Santos NA Barossa Pty Ltd v Tipakalippa*, the Court construed the following terms used in regulation 25(1)(d) as follows:

- **functions**—a power or duty to do something[49]
- **interests**—in accordance with the accepted concept of "interest" in other areas of public administrative law, and including "any interest possessed by an individual whether or not the interest amounts to a legal right or is a proprietary or financial interest or relates to reputation"[50]
- **activities**—broadly and is broader than the definition of 'activity' in regulation 5 of the OPGGS(E)R and is likely directed to what the relevant person is already doing[51].

Persons or organisations are considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R if their functions, interests or activities may be affected by the petroleum activity to be carried out under the EP. CAPL's approach has been to take a broad interpretation of "function, interest, and activity" and has screened in persons as potentially relevant and contacted them to advise whether that individual or organisation identifies themselves as a relevant person.

Where interests are held communally, CAPL has made a decisional choice to consult with representative bodies (Ref. 166 at paragraphs 96–102) and has sought to do so through meetings (Ref. 166 at paragraph 104). CAPL has sought to provide sufficient information to individuals who are relevant persons by providing information to representative bodies for dissemination with members and by attending meetings with group members (Ref. 166 at paragraph 47) and CAPL has also sought to identify those representative body organisations themselves as relevant persons (Ref. 166 at paragraph 48). As documented in the summary of consultation (Appendix E), CAPL has asked these representative bodies if there are persons outside of the individuals they represent who may be relevant persons for the purposes of consultation to endeavour to make all necessary efforts to identify relevant persons.

Table 7-2: Identification of a person or organisation

Category of persons or organisations	Considerations for identifying a relevant person
Commercial fishery licence holders and/or representative bodies	Commonwealth commercial fisheries: • of recent active fishing effort (based on annual ABARES data) occurring within the OA • fishing method, preferred locations or water depths, fishing season • key target species, distribution, and behaviour • potential for temporal and/or spatial interaction between petroleum activity and the commercial fishery. State commercial fisheries: • guidance from WAFIC (Ref. 174) regarding separate consultation strategies for unplanned events such as oil spills, where the

[48] Paragraph 51 of *Santos NA Barossa Pty Ltd v Tipakalippa [2022] FCAFC 193* (Ref. 166).
[49] Paragraph 60 of *Santos NA Barossa Pty Ltd v Tipakalippa* [*2022] FCAFC 193* (Ref. 166).
[50] Paragraphs 63 and 65 of *Santos NA Barossa Pty Ltd v Tipakalippa* [*2022] FCAFC 193* (Ref. 166).
[51] Paragraphs 58 and 59 of *Santos NA Barossa Pty Ltd v Tipakalippa [2022] FCAFC 193* (Ref. 166).

Category of persons or organisations	Considerations for identifying a relevant person
	titleholder can demonstrate likelihood of an event is “extremely low” • fishery management area intersects the OA, and a record of recent active fishing effort (based on DPIRD FishCube data) occurring within the OA • fishing method, preferred locations or water depths, fishing season • key target species, distribution, and behaviour • potential for temporal and/or spatial interaction between petroleum activity and the commercial fishery. Peak industry bodies: • where a fishery has been determined as relevant, the representative body is also considered relevant.
ENGOs	• CAPL’s operating experience in the NWS and pre-existing knowledge of local ENGOs • intersection between the spatial extent of the Hydrocarbon EMBA and/or values and sensitivities of the environment and the ENGO’s interests.
First Nations people and/or representative bodies	First Nations people utilise the coast and marine areas for their cultural identity, health and wellbeing, and their domestic and commercial economies. Therefore, the activities under the EP may be relevant to First Nations people who have an enduring cultural and spiritual connection to the sea. First Nations people or groups were identified through: • Native Title claims or determinations intersecting with, or within the vicinity of the Hydrocarbon EMBA • where an AMP is present within the Hydrocarbon EMBA, a review of any identified First Nations people or groups • review of Native Title determinations to determine cultural and/or spiritual link with BIAs • Country located within or coastally adjacent to the Hydrocarbon EMBA Representative bodies: • CAPL’s operating experience in the NWS and previous interactions with First Nations representative bodies • where people or a group has been determined as relevant, the representative body is also considered relevant.
Local government departments or agencies	• local government boundary intersects the Hydrocarbon EMBA
Other petroleum titleholders	• CAPL’s operating experience in the NWS and pre-existing knowledge of other petroleum operators • other Commonwealth (based on spatial data from NOPTA) petroleum titles that intersect with the Hydrocarbon EMBA, and with current or proposed activities occurring (based on publicly available EPs from NOPSEMA’s EP submission website) within the Hydrocarbon EMBA • other State (based on spatial data from DMPE) petroleum titles that intersect with the Hydrocarbon EMBA, and with current or proposed activities occurring (based on publicly available EP summaries from DMPE Environmental Assessment and Regulatory System [EARS] Online database) within the Hydrocarbon EMBA • potential for temporal and/or spatial interaction between petroleum activity and the operator of another petroleum title.

Category of persons or organisations	Considerations for identifying a relevant person
Tourism and recreation operators	Tourism and recreation operators: • CAPL's operating experience in the NWS and pre-existing knowledge of local tour and recreational operators • a record of recent active tour operator fishing effort (based on DPIRD FishCube data) occurring within the Hydrocarbon EMBA • where an AMP is present within the Hydrocarbon EMBA, a review of the 'authorisations issued' from Parks Australia (Ref. 166) • potential for temporal and/or spatial interaction between petroleum activity and the tourism/recreational operator. Peak industry bodies: • where a tourism or recreational operator has been determined as relevant, the representative body is also considered relevant.
WA World Heritage advisory committees	• World Heritage area intersects the Hydrocarbon EMBA, and an Australian World Heritage advisory committee exists

The persons or organisations that were identified as a relevant person for consultation during the preparation of this EP are presented in Table 7-3.

7.5.5 Relevant persons under regulation 25(1)(e)

In accordance with the OPGGS(E)R, relevant persons may include any other person or organisation that CAPL considers relevant.

Where a person or organisation on this list does not already become a relevant person under regulation 25(1)(d) (using the process as described in Section 7.5.4), CAPL may voluntarily opt to include them in the consultation for the petroleum activity as part of wider and ongoing engagement with their broad stakeholder base.

7.5.6 Self-identification

As part of the consultation process (Figure 7-1), CAPL publicly advertises upcoming petroleum activities (refer to Section 7.6), to allow for any authorities, persons, or organisations that have not already been identified through the identification process to review information about the petroleum activity, self-identify as a relevant person, and register as a relevant person with CAPL.

This self-identification pathway was included in the consultation process to facilitate a sufficiently broad capture of ascertainable persons and allow for feedback that CAPL may not have otherwise received.

Where an authority, person, or organisation does self-identify, CAPL conducts an assessment to validate that they are a relevant person for an EP (aligned with the considerations described in Section 7.5); and if they are, an assessment of the merits of objections or claims and a response was progressed (as per the process in Section 7.10).

No new relevant persons self-identified during the consultation period.

7.5.7 Conclusion on relevant persons identified

As a result of application of the methodology and identification, the relevant persons identified for the purposes of regulation 25 of the OPGGS(E)R are listed in Table 7-3. CAPL is confident that it has used multiple lines of evidence to identify all relevant persons.

Table 7-3: Relevant persons identified for consultation during preparation of the EP

Category of persons or organisations	Considerations for identifying a relevant person
Commonwealth department or agencies (regulation 25[1][a])	
Australian Communications and Media Authority (ACMA)	ACMA is a relevant agency for consultation where an activity has the potential to impact economic or social benefits communications infrastructure for Australia. As identified in Section 5.4.6, the Hydrocarbon EMBA overlaps existing submarine cables. Therefore, the activities under the EP may be relevant to ACMA.
Australian Fisheries Management Authority (AFMA)	As identified in NOPSEMA's consultation guideline (Ref. 169), AFMA is a relevant agency for consultation where an activity can impact or has the potential to impact on fisheries resources in AFMA managed fisheries. Commonwealth fishery management areas have been identified as overlapping with the Hydrocarbon EMBA (Section 5.4.1.1). Therefore, the activities under the EP may be relevant to the AFMA.
Australian Hydrographic Office (AHO)	As identified in NOPSEMA's consultation guideline (Ref. 169), AHO is a relevant agency for consultation when nautical products or other maritime safety information is required to be updated. Vessel operations are required for the activities within scope of this EP (Section 4.4.2), a SNA will be requested around the MODU (Section 4.4.2). Therefore, the activities under the EP may be relevant to the AHO.
Australian Maritime Safety Authority (AMSA)	As identified in NOPSEMA's consultation guideline (Ref. 169), AMSA is a relevant agency for consultation where a proposed activity may impact on the safe navigation of commercial shipping in Australian waters. The Hydrocarbon EMBA intersects shipping routes (Section 5.4.4). Therefore, the activities under the EP may be relevant to the AMSA.
Clean Energy Regulator	As identified in NOPSEMA's consultation guideline (Ref. 169), the Clean Energy Regulator is a relevant agency for consultation where: • a change to an existing NGER-reporting facility or activity that triggers an EP revision • a revision for an existing Safeguard-covered facility or activity. • construction, installation or operation of a new facility or activity that is expected to trigger the Safeguard Mechanism. • a greenhouse gas appraisal or storage activity. While the activities under this EP relate to drilling, this EP may be relevant to the Clean Energy Regulator.
Department of Agriculture, Fisheries and Forestry (DAFF)	As identified in NOPSEMA's consultation guideline (Ref. 169), DAFF is a relevant agency for consultation where an activity has the potential to impact on fishing operations and/or fishing habitats in Commonwealth waters. Commonwealth and State managed fisheries have been identified as overlapping with the Hydrocarbon EMBA (Section 5.4.1). Therefore, the activities under the EP may be relevant to DAFF.
Director of National Parks (DNP)	As identified in NOPSEMA's consultation guideline (Ref. 169), DNP is a relevant agency for consultation where: • the activity or part of activity is within the boundaries of a proclaimed AMP • activities proposed to occur outside a reserve may impact on the values within an AMP

Category of persons or organisations	Considerations for identifying a relevant person
	• an environmental incident occurs in Commonwealth waters surrounding an AMP and may impact on the values within the park. The Hydrocarbon EMBA intersects AMPs (Section 5.5.1). Therefore, the activities under the EP may be relevant to the DNP.
Department of Climate Change, Energy, Environment and Water (DCCEEW)	As identified in NOPSEMA's consultation guideline (Ref. 169), DCCEEW is a relevant agency for consultation where an activity has the potential to directly or indirectly adversely impact on protected UCH. The Hydrocarbon EMBA overlaps with UCH (shipwrecks) (Section 5.6). Therefore, the activities under the EP may be relevant to the DCCEEW.
Department of Defence (DoD)	As identified in NOPSEMA's consultation guideline (Ref. 169), DoD is a relevant agency for consultation where: • a proposed activity may impact DoD training and operational requirements • a proposed activity encroaches on known training areas and/or restricted airspace • there is a risk of unexploded ordnance in the area where the activity is taking place. DoD areas and/or facilities intersect the Hydrocarbon EMBA (Section 5.4.6). Therefore, the activities under the EP may be relevant to the DoD.
State department or agencies (regulation 25[1][a])	
Department of Biodiversity, Conservation and Attractions (DBCA)	DBCA promotes biodiversity and conservation through sustainable management of WA's species, ecosystems, lands and the attractions in their care. The Hydrocarbon EMBA intersects State terrestrial and marine protected areas (Sections 5.5.2 and 5.5.3). Therefore, the activities under the EP may be relevant to DBCA.
Department of Primary Industries and Regional Development (DPIRD)	DPIRD's responsibility is to conserve, sustainably develop and share the use of WA's aquatic resources and their ecosystems. As identified in their consultation guideline (Ref. 175), DPIRD considers that it is a relevant person where a petroleum activity may potentially affect commercially and recreationally important fish species, their prey and habitats, and the business activities of the fishers who harvest these resources in State or Commonwealth waters. State managed fisheries and recreational fisheries have been identified as overlapping with the Hydrocarbon EMBA (Sections 5.4.1.2 and 5.4.2). Therefore, the activities under the EP may be relevant to DPIRD.
Department of Transport and Major Infrastructure (DTMI) - Maritime Environmental Emergency Response (MEER) - Marine Pollution	DTMI (MEER) is the hazard management agency for marine oil pollution and maritime transport emergencies in Western Australian waters. The MEER's role is to develop marine oil spill response capabilities, provide resources and support during response operations, training programs, assist in the development of oil spill contingency plans and raise community awareness about the impact of oil spills. MEER considers that it is a relevant person if activities have the potential to cause a marine oil pollution incident in State waters (Ref. 176). The unplanned hydrocarbon release scenario predicted some areas of State waters may be exposed (Sections 8.15 and 8.16). Therefore, the activities under the EP may be relevant to DTMI.

Category of persons or organisations	Considerations for identifying a relevant person
Department of Energy and Economic Diversification (DEED)	DEED lead Western Australia's energy transition and economic development, facilitate international trade and investment, and promote the international education, science and innovation sectors. Therefore, the activities under this EP may be relevant to DEED.
Department of Water and Environment (DWER)	DWER supports WA's community, economy and environment by managing and regulating the state's environment and water resources on behalf of the Minister for the Environment. Therefore, the activities under this EP may be relevant to DWER.
Pilbara Ports Authority	The Pilbara Ports Authority assumes oversight of Barrow Island, Onslow, Port of Ashburton and more and operates as a corporatized entity that reports to the State Government of WA's Minister of Ports. The activity occurs within Commonwealth waters, requires vessels and ports for use. Therefore, the activities under the EP may be relevant to the Pilbara Ports Authority.
Environmental Protection Authority (EPA)	The WA EPA is established under the *Environmental Protection Act 1986* (Cth), with the objective to protect the environment and to prevent, control and abate pollution and environmental harm. The EPA provides strategic advice to the Minister of the Environment. Therefore, the activities under this EP may be relevant to the EPA.
Department of the responsible State Minister (regulation 25[1][b])	
Department of Mines, Petroleum and Exploration (DMPE)	DMPE is the department of the responsible State Minister. Therefore, they are considered a relevant person as per regulation 25(1)(c) of the OPGGS(E)R.
Person or organisation whose functions, interests, or activities may be affected by the petroleum activity (regulation 25[1][d])	
First Nations people and/or representative bodies	
Buurabalayji Thalanyji Aboriginal Corporation (BTAC) Thalanyji people	The BTAC was registered in 2008 to represent, protect, and support the interests of the Thalanyji people. Thalanyji Country spreads out across the Ashburton River coastal plain south to Tubridji Point, then across to Yannarie River and upstream to Emu Creek, across the range hills of southwest Pilbara to Henry River and Cane River in the north. The Hydrocarbon EMBA intersects this area of coast, and also extends into the offshore waters of the Pilbara. No Native Title determination currently exists within the Hydrocarbon EMBA and this group have not been identified in an AMP Management Plan. However, given that the Hydrocarbon EMBA occurs offshore from the Pilbara coast, and engagement with BTAC identified that Sea Country is of recognised value to the Thalanyji people, the activities under the EP may therefore be relevant to this RNTBC and the Thalanyji people. Note: CAPL has also consulted NTGAC who also represents the Thalanyji people for Native Title rights and interests.
MCH (individual representative) MCH (family organisation)	An individual contacted CAPL via phone in August 2023 and identified themselves as a Traditional Custodian for the Mardathoonera people. The Mardathoonera people are a Pilbara language group, and engagement with the individual identified that Barrow Island was culturally significant.

Category of persons or organisations	Considerations for identifying a relevant person
	Given that the waters off Barrow Island overlap the Hydrocarbon EMBA for this EP, CAPL considers that the individual and the family organisation has functions, interests or activities that may be affected by the petroleum activity to be carried out under the EP. Therefore, they are considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC) Baiyungu people Thalanyji people Yinggarda people	The NTGAC was registered in 2019 to represent, protect and support the interests of the Baiyungu, Thalanyji and Yinggarda people. The RNTBC represents an area that extends approximately from Exmouth Gulf to Lake Macleod. The Hydrocarbon EMBA does not intersect this area of coast, however the Hydrocarbon EMBA is within the offshore waters of the Pilbara and Gascoyne. Native Title determination WCD2019/016 intersects the outer extent of the Hydrocarbon EMBA (Section 5.6). Therefore, the activities under the EP may be relevant to this RNTBC and the Baiyungu, Thalanyji and Yinggarda people. Note: Baiyungu Aboriginal Corporation (BAC) have advised CAPL to undertake EP engagement with them via NTGAC.
Nhuwala Claimant Group (NCG)	The NCG filed a Native Title Determination Application (WC2024/008) on 18 December 2024. The claim area is located in the Pilbara region and extends offshore. No Native Title determination currently exists within the Hydrocarbon EMBA. However, given that the Hydrocarbon EMBA occurs offshore from the Pilbara coast, the activities under the EP may therefore be relevant to the Nhuwala Claimants.
Wirrawandi Aboriginal Corporation (WAC) RNTBC Mardathoonera people Yaburara people	The WAC was registered in 2018 to hold and manage the native title rights and interests for the Mardathoonera and Yaburara people. Mardathoonera and Yaburara Country is in the Pilbara region (approximately between Maitland and Robe rivers). The Hydrocarbon EMBA does not directly intersect with this area of coast, however it does extend into the offshore waters of the Pilbara. Native Title determination (WCD2018/006) does not intersect the Hydrocarbon EMBA. However, given that the Hydrocarbon EMBA occurs offshore from the Pilbara coast, the activities under the EP may be relevant to this RNTBC and the Mardathoonera and Yaburara people.
Commercial fishery licence holders and/or representative bodies	
Australian Council of Prawn Fisheries Aquaculture Council of Western Australia Australian Southern Bluefin Tuna Industry Association (ASBTIA) Commonwealth Fisheries Association	These organisations are peak bodies representing the commercial fishers within Commonwealth or State-managed commercial fisheries. Commonwealth and State managed fisheries have been identified within the Hydrocarbon EMBA (Section 5.4.1). As such, these organisations have functions, interests, or activities, that may be affected by the activities to be carried out under the EP.

Category of persons or organisations	Considerations for identifying a relevant person
Tuna Australia	
Western Australian Fishing Industry Council (WAFIC)	
Tourism and recreation operators	
Recfishwest	This organisation is the peak body representing the State-managed recreational fisheries. Recreational fishing has been identified within coastal and nearshore areas of the Hydrocarbon EMBA (Section 5.4.2). As such, this organisation has functions, interests, or activities, that may be affected by the activities to be carried out under the EP.
Ningaloo Visitor Centre	Ningaloo Visitor Centre is located in Exmouth and provides advice and services to both locals and tourists. The Hydrocarbon EMBA intersects Commonwealth and State waters offshore, and some offshore islands, within the Pilbara and Gascoyne regions (Section 5.1). As such, this organisation has functions, interests, or activities, that may be affected by the activities to be carried out under the EP.
Boating Industry Association Western Australia (BIAWA)	BIAWA is the voice of the West Australian recreational boating industry, with the main purpose to promote and encourage safe boating and other aquatic sports and pastimes within WA. The Hydrocarbon EMBA intersects Commonwealth and State waters offshore, and some offshore islands, within the Pilbara and Gascoyne regions. As such, this organisation has functions, interests, or activities, that may be affected by the activities to be carried out under the EP.
Marine Tourism Association of Western Australia (MTWA)	MTWA is the recognised charter industry association in WA with peak body status representing the charter sector. Charter vessels may operate within the Hydrocarbon EMBA (Section 5.4.5). As such, this organisation has functions, interests, or activities, that may be affected by the activities to be carried out under the EP.
Ashburton Anglers	Recreational fisheries, tourism and recreational activities have been identified as occurring within or adjacent to the Hydrocarbon EMBA (Section 5.4.2). As such, these businesses may have functions, interests, or activities, that may be affected by the activities to be carried out under the EP.
Apache Fishing Charters	
Aquatic Adventure Exmouth	
Archipelago Adventures	
Blue Juice Charters	
Blue Horizon Charters	
Blue Lightning Fishing Charters	
Bluesun 2 Boat Charters	
Cape Immersion Tours	

Category of persons or organisations	Considerations for identifying a relevant person
Exmouth Dive and Whalesharks Ningaloo	
Exmouth Dive Centre	
Exmouth Game Fishing Club	
Image Dive and Charters	
Innkeeper Sport Fishing Charter	
Kings Ningaloo Reef Tours	
Live Ningaloo	
Mackerel Islands and Onslow Beach Resort	
Mahi Mahi Charters	
Montebello Island Safaris	
Ningaloo Blue Dive	
Ningaloo Coral Bay Boats	
Ningaloo Discovery	
Ningaloo Fly Fishing	
Ningaloo Glass Bottom Boat	
Ningaloo Marine Interaction	
Ningaloo Reef Dive	
Ningaloo Reef to Range Tours	
Ningaloo Safari Tours	
Ningaloo Sportfishing Charters	
Ningaloo Whaleshark n Dive	
Ningaloo Whaleshark Swim	

Category of persons or organisations	Considerations for identifying a relevant person
Ocean Eco Adventures	
On Strike Charters	
Peak Sportfishing Charters	
Sail Ningaloo	
Three Islands Whale Shark Tours	
Top Gun Charters	
Ultimate WaterSports	
View Ningaloo	
Wilderness Island	
Yardi Creek Boat Tours	
Local government departments or agencies	
Shire of Ashburton	The Hydrocarbon EMBA intersects State waters offshore, and some offshore islands, within the Pilbara and Gascoyne regions. Therefore, local governments may be considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Shire of Carnarvon	
Shire of Exmouth	
WA World Heritage advisory committees	
Ningaloo Coast World Heritage Advisory Committee	The Ningaloo Coast World Heritage Advisory Committee provides advice to the Commonwealth and State Environment Ministers on the protection, conservation and management specific to Ningaloo Coast World Heritage Area. The Hydrocarbon EMBA intersects the Ningaloo Coast World and National heritage areas (Section 5.6). Therefore, Ningaloo Coast World Heritage Advisory Committee is considered a relevant person under regulation 25(1)(d) of the OPGGS(E)R.
Other petroleum titleholders	
Carnarvon Energy	Petroleum operations have been identified to occur within the spatial extent of the Hydrocarbon EMBA (Section 5.4.6). Therefore, other petroleum titleholders are considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Eni Australia	
Exxon Mobil	
Jadestone Energy	
Kato Energy / Kato NWS Pty Ltd	

Category of persons or organisations	Considerations for identifying a relevant person
Kufpec	
Santos	
Shell	
Western Gas	
Woodside	
ENGOs	
Australian Marine Conservation Society	ENGOs are organisations concerned about public welfare, people and the environment. Several environmental receptors intersect with the Hydrocarbon EMBA (Section 5). Therefore, ENGOs may be considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Cape Conservation Group	
Protect Ningaloo	
Other	
Australian Institute of Marine Science (AIMS)	AIMS undertake research on marine fauna through the North-west Shoals to Shore Research Program (NWSSRP). The NWSSRP monitors Pygmy blue whales and turtles amongst other marine fauna that is present within the Hydrocarbon EMBA. Therefore, AIMS may be considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Australian Marine Oil Spill Response Centre (AMOSC)	AMOSC are a person or organisation whose functions, interests or activities may be affected by the activities to be carried out under the environment plan. Therefore, they are considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Care for Hedland Environmental Association	Care for Hedland are an independent environmental interest group, pursuing a shared vision of environmental awareness and improvements for the townships of Port and South Hedland, along with the wider Pilbara region. They run a community-based Flatback Turtle monitoring program, and engagement with the representative identified that a genetic link existed between the Flatback Turtles nesting populations at Port Hedland, Barrow Island, and the broader NWS. While there is no predicted interaction with Port Hedland from planned activities or an unplanned event associated with this EP, given the migratory nature of marine turtles and that the Pilbara Coast represents a single genetic stock, CAPL considers that the Care for Hedland Environmental Association has functions, interests or activities that may be affected by the petroleum activity to be carried out under the EP. Therefore, they are considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Exmouth Chamber of Commerce and Industry (ECCI)	The ECCI is a representative organisation that promotes the interests of members and the business community in Exmouth, and Gascoyne region. The Hydrocarbon EMBA for this EP intersects Commonwealth and State waters

Category of persons or organisations	Considerations for identifying a relevant person
	offshore of the Pilbara and Gascoyne regions. Therefore, ECCI may be considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Exmouth Gulf Taskforce	The Exmouth Gulf Taskforce provides high level advice to the Minister for the Environment, on the environmental management of the Exmouth Gulf and its surrounds, to help preserve the region's unique environmental, cultural and social values. Therefore, Exmouth Gulf Taskforce may be considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Carnarvon Chamber of Commerce (CCI)	The CCI is a representative organisation that promotes the interests of members and the business community in Carnarvon and Gascoyne region. The Hydrocarbon EMBA for this EP intersects Commonwealth and State waters offshore of the Pilbara and Gascoyne regions. Therefore, CCI may be considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Onslow Chamber of Commerce and Industry (OCCI)	The OCCI is a representative organisation that promotes the interests of members and the business community in Onslow and the Pilbara Region. The Hydrocarbon EMBA for this EP intersects Commonwealth and State waters offshore of the Pilbara and Gascoyne regions. Therefore, OCCI may be considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Oil Spill Response Limited	Oil Spill Response Limited are a person or organisation whose functions, interests or activities may be affected by the activities to be carried out under the environment plan. Therefore, they are considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Telstra	Telstra are a person or organisation whose functions, interests or activities may be affected by the activities to be carried out under the EP. Therefore, they are considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Vocus Communications	Vocus Communications are a person or organisation whose functions, interests or activities may be affected by the activities to be carried out under the environment plan. Therefore, they are considered relevant persons under regulation 25(1)(d) of the OPGGS(E)R.
Any other person or organisation that the titleholder considers relevant (regulation 25[1][e])	
Commercial fishery licence holders and/or representative bodies	
Pearl Producers Association	Pearl Producers Association are the peak representative body of the Australian South Sea Pearling Industry. Relevant pearling operations occur outside the boundary of Hydrocarbon EMBA, however under regulation 25(1)(e) CAPL selected to include the council in consultation.
Western Rock Lobster Council	Western Rock Lobster Council is the peak industry body representing the interests of the western rock lobster fishery. The Western Rock Lobster fishery operates outside the boundary of Hydrocarbon EMBA, however under regulation 25(1)(e) CAPL selected to include the Western Rock Lobster Council in consultation.

Category of persons or organisations	Considerations for identifying a relevant person
Tourism and recreation operators	
Tourism Western Australia	The Hydrocarbon EMBA intersects Commonwealth and State waters offshore, and some offshore islands, within the Pilbara and Gascoyne regions, and therefore under regulation 25(1)(e), CAPL selected to include this organization in consultation.
Other	
Pilbara Development Commission	The Pilbara Development Commission works across government to support economic growth, stimulate job growth and increase industry innovation among other things. The Hydrocarbon EMBA intersects Commonwealth and State waters offshore, and some offshore islands, within the Pilbara and Gascoyne regions, and therefore under regulation 25(1)(e) CAPL selected to include this organization in consultation.
WA Coastal and Marine Community Network	The Hydrocarbon EMBA intersects Commonwealth and State waters offshore, and some offshore islands, within the Pilbara and Gascoyne regions, and therefore under regulation 25(1)(e) CAPL selected to include this organization in consultation.
WA Marine Science Institute	The Western Australian Marine Science Institution is a collaboration of state and federal government and academic science organisations working together to provide independent marine research for the benefit of the environment, the community and the Blue Economy. The Hydrocarbon EMBA intersects Commonwealth and State waters offshore, and some offshore islands, within the Pilbara and Gascoyne regions, and therefore under regulation 25(1)(e) CAPL selected to include this organization in consultation.
Western Australian Museum	The Western Australian Museum is the State's premier cultural organisation, housing WA's scientific and cultural collection. The Hydrocarbon EMBA intersects Commonwealth and State waters offshore, and some offshore islands, within the Pilbara and Gascoyne regions, and therefore under regulation 25(1)(e) CAPL selected to include this organization in consultation.
Centre for Whale Research Western Australia	The Centre for Whale Research (Western Australia) Inc. is a non-profit research established in 1993 to conduct scientific research into marine mammals. The Hydrocarbon EMBA intersects Commonwealth and State waters offshore, and some offshore islands, within the Pilbara and Gascoyne regions, and therefore under regulation 25(1)(e) CAPL selected to include this organization in consultation.
Wilderness Society	ENGOs are organisations concerned about public welfare, people and the environment. The Hydrocarbon EMBA intersects Commonwealth and State waters offshore of the Pilbara and Gascoyne regions, and therefore under regulation 25(1)(e) CAPL selected to include this organization in consultation.
Whale and Dolphin Conservation Society	
International Fund for Animal Welfare	
Greenpeace	

Category of persons or organisations	Considerations for identifying a relevant person
Conservation Council of Western Australia	
Australian Conservation Foundation	

7.6 Sufficient information

Under regulation 25(2) of the OPGGS(E)R and NOPSEMA's guidelines (Ref. 163; Ref. 164), for the purpose of consultation, the titleholder must provide each relevant person with sufficient information to enable them to make an informed assessment of the possible consequences of the petroleum activity on their functions, interests, or activities.

The base level of information provided to all relevant persons whose functions, interests or activities may be affected by the environmental impacts or risks of the activity includes:

- maps of the proposed petroleum activity location and the associated Hydrocarbon EMBA
- a summary of the petroleum activity, including indicative schedule and duration
- a summary of the potential impacts and risks as identified by CAPL
- a preliminary assessment of how the potential impacts and risks may impact the environmental and socio-cultural values and sensitivities
- a summary of the proposed control measures that CAPL has adopted to reduce the predicted consequence and/or likelihood of the potential impact or risk.

This base level of information is the minimum required for relevant persons to make an informed assessment of the potential consequences to the persons' functions, interest, or activity because it informs the relevant person of:

- the activity (including spatial and timing information that may intersect with their function, interest, or activity)
- the impacts and risks of the petroleum activity (including the spatial extent of the Hydrocarbon EMBA and intersection with BIAs) to allow an assessment of how that may impact or create a risk to the relevant persons' functions, interests, or activities
- the control measures to reduce the impacts or risks of the petroleum activity to environmental and socio-cultural values and sensitivities.

Additional information may be provided to reflect the information requested through co-design of consultation, to better enable them to provide feedback related to potential interactions with their function, interest, or activity, or in response to their objection or claim. This includes verbal information and answers to questions during consultation discussions.

In addition to consultation conducted specifically for this EP, CAPL recognises that previous consultations undertaken (e.g. stakeholder engagement during preparation of the Gorgon Backfill Fields Development OPP, or relevant persons consultation for other exploration or production drilling EPs), have contributed to building familiarity with relevant persons regarding the nature of petroleum exploration and production activities in the region.

While these previous consultations are not relied upon in place of consultation undertaken for this EP, this prior engagement supports relevant persons to better understand the typical characteristics of such activities and to make an informed assessment of the potential consequences of the proposed petroleum activity on their functions, interests, or activities.

The following is a summary of materials released as part of the consultation for this EP:

- CAPL issued the quarterly publication of the “Bulletin” to Traditional Owner representative bodies which included preliminary information on the proposed petroleum activity. The Bulletin provides an overview of proposed activities, including descriptions, location maps, timing, potential impacts and risks, and the schedule for formal consultation
- CAPL issued an information sheet to identified relevant persons on the 27 November 2025; this information sheet included information about the proposed petroleum activity, potential impacts and risks, control measures, and included maps showing Hydrocarbon EMBA
- CAPL published information regarding the proposed activity to the Online Consultation Hub (upcoming activities | chevron australia — Australia.chevron.com) on 26 November 2025 and emailed the link to relevant persons; the Online Consultation Hub contains all the base level of information as described above
- CAPL published notices in The Australian and The West Australian on 8 December 2025; in the Pilbara News, Mid-West Times, and Northwest Telegraph on 10 December 2025, in Business News on 15 December 2025, and National Indigenous Times December 2025 edition
- CAPL offered face-to-face meetings with relevant persons (see Appendix E).

A copy of the consultation material is included in Appendix F. A summary of the consultation strategy and information provided to each category of relevant persons is included in Table 7-4.

Table 7-4: Consultation strategy and information provided to relevant persons

Category of persons or organisations	Consultation strategy and information provided
Commercial fishery licence holders and/or representative bodies	• initial correspondence with WAFIC to provide base level information on the petroleum activity and link to the CAPL Online Consultation Hub • follow up correspondence with WAFIC to confirm the commercial fishery licence holders to be consulted • in consultation with WAFIC, determine the level of consultation required and whether tailored consultation material needs to be developed • provision of consultation material to WAFIC for distribution to relevant commercial fishery licence holders • WAFIC provides any feedback received to CAPL, and CAPL provides information to respond to commercial fishery licence holders; any feedback received is considered in the development of the EP • where a commercial fishery that is not represented by WAFIC has been determined as relevant, the representative body is provided consultation material and feedback is requested • after a reasonable period has been provided to consider the consultation information (as outlined in Section 7.7), CAPL will confirm with WAFIC or the relevant industry body (as required) whether further consultation is required • ongoing consultation with follow up correspondence, phone calls and meetings as required.

Category of persons or organisations	Consultation strategy and information provided
First Nations people and/or representative bodies	• initial correspondence with relevant First Nations representative bodies to request a meeting with the board, Elders, or other relevant persons • provision of base level information on the petroleum activity and link to the CAPL Online Consultation Hub as a precursor to face-to-face meetings • initial face-to-face meeting held using bespoke consultation material, including posters, presentations and verbal discussions – a key objective of the initial meeting is to co-design the consultation strategy going forward and to determine if there are additional relevant persons not present at the meeting who should be informed and consulted with • follow up emails, phone calls and meetings, as required, to ensure the functions, interests and activities of First Nations peoples' have been identified and to gain an understanding of cultural values and sensitivities in the Hydrocarbon EMBA; any feedback received is considered in the development of the EP • site visits on Country with First Nations people may be conducted as required • after a reasonable period has been provided to consider the consultation information (as outlined in Section 7.7), CAPL provides the First Nations people and/or representative bodies a summary of consultation undertaken to date and requests agreement on the summary • ongoing consultation with follow up correspondence, phone calls and meetings as required.
Environmental non–government organisations (ENGOs) Government departments or agencies Other petroleum titleholders / commercial industries Tourism and recreation operators WA World Heritage advisory committees Self-identified and other relevant persons	• provision of base level information on the petroleum activity and link to the CAPL Online Consultation Hub via email with a request for feedback and an offer to meet face-to-face • where consultation guidance material is available (as outlined in Section 7.6), CAPL tailors its consultation to meet the requirements of the guidance material • local community / town meetings may be held using presentations, posters and verbal discussions as required • any feedback received is responded to and considered in the development of the EP. • after a reasonable period has been provided to consider the consultation information (as outlined in Section 7.7), CAPL will determine whether further consultation is required • ongoing consultation with follow up correspondence, phone calls and meetings as required.

7.7 Reasonable period

Under regulation 25(3) of the OPGGS(E)R and NOPSEMA's guidelines (Ref. 163; Ref. 164), relevant persons must be provided with a reasonable period for the consultation to occur, allowing the relevant person to make an informed assessment of the possible consequences of the proposed petroleum activity on their functions, interests, or activities and respond to the titleholder. "Reasonable period" was not defined by the *Full Federal Court in Tipakalippa* (Ref. 166), however, consistent with the Court's analysis in the "NTA authorities" Section of the judgment, CAPL has sought to identify existing guidelines and practices to help inform what a "reasonable period" may constitute for the relevant person.

Guidance on consultation with Commonwealth departments or agencies indicates that agencies will provide an initial response to consultation requests within 10 business days (Ref. 163) or up to eight weeks (Ref. 176).

Available guidance regarding consultation with State departments or agencies indicates a reasonable period for standard activities is no less than 20 business days (Ref. 175), and up to six weeks (Ref. 176).

Guidance taken from the *Aboriginal Cultural Heritage Act 2021—Consultation Guidelines* (Ref. 177) suggests that up to 12 weeks may be a reasonable period of time to allow identification, contact, and response, from First Nations peoples (subject to any alternative timeframe being agreed through co-design of consultation).

Based on consultation undertaken to date feedback from First Nations peoples is that 6–12 weeks is a reasonable period of time depending on the nature and scale of the activity. This is also largely consistent with the 'low impact activities' procedure under the *Native Title Act 1993* (Cth) which allows for between two and four months for notification of a low impact future act and receipt of objections.

Furthermore, CAPL has provided Traditional Owner representative bodies, preliminary information on the activity around six months prior to the formal consultation period to provide sufficient time for Traditional Owners to assess potential consequences on their functions, interests and activities while also enabling a greater understanding of the planned activity.

A 6-week consultation period was determined to be appropriate by CAPL for this EP, given the nature and scale of the EP and on the basis that relevant persons had received preliminary information on the activity prior to the consultation person. An extra 2-week period was included into the consultation period by this EP to account for the Christmas and New Year period, recognising that relevant persons may require additional time during this period to review consultation materials and provide feedback.

CAPL provided all relevant persons an initial period following the issue of consultation materials to respond. Where no response was received, CAPL followed up with each relevant person (via phone, email, or in person) to enquire if there was any clarifications or additional information required to aid their assessment of any interactions with their functions, interests, or activities.

7.8 Consultation co-design

Consultation co-design includes design of type of information, method of engagement, frequency of meetings and relationship-building (and may also include a relevant person determining they do not want to participate in consultation). As outlined above in Section 7.1, the purpose of consultation is to enhance EPs through input from relevant persons through enabling a better understanding of the social, economic and cultural features of the environment. Therefore, those relevant persons whose functions, interests, and activities are likely to be affected by planned activities are the focus for consultation as their input is most critical and relevant to enhancing the EP.

The consultation design is reviewed on a case-by-case basis to incorporate any feedback from relevant persons regarding the type of information or method of engagement that is preferred to ensure that the purpose of the consultation is achieved. The consultation method of engagement may change over time as the nature of the relationship evolves, the relevant person's understanding of petroleum activities matures, and the information provided by the relevant person

is incorporated into enhanced EPs and is carried forward in subsequent submissions.

Face-to-face consultation is CAPL's preferred methodology, however it may be necessary to undertake consultation in writing where this is the relevant person's preferred methodology or where circumstances dictate.

Where it is agreed that it is appropriate by the parties (CAPL and relevant person), CAPL and relevant person will work together to develop an engagement plan that sets out the arrangements for consultation, reflecting the outcomes of the co-design process that has taken place. The engagement plan provides a structured approach to building a relationship with the relevant person and forming a partnership based on consultations, annual planning meetings, time on Country and work in progress meetings.

Where it is agreed as appropriate by the parties, CAPL enters into consultation agreements with relevant persons. These agreements establish a framework for consultation and engagement, including agreed costs and fees associated with consultation engagements. CAPL considers Traditional Owner relevant persons to be Aboriginal cultural heritage subject matter experts and accordingly reimburses them for their time and, where necessary, third-party assistance on technical matters.

Further detail on consultation agreements, engagement plans, capacity building and relationship building is described in Section 10.3.4.3.

7.9 Sensitive information

Regulation 25(4) of the OPGGS(E)R requires that "[t]he titleholder must tell each relevant person the titleholder consults that:

a) the relevant person may request that particular information the relevant person provides in the consultation not be published; and

b) information subject to such a request is not to be published under this Part".

Under regulation 26(8) of the OPGGS(E)R "all sensitive information (if any) in an environment plan, and the full text of any response by a relevant person to consultation under regulation 25 in the course of preparation of the plan, must be contained in the sensitive information part of the plan and not anywhere else in the plan".

In accordance with regulations 26(8) of the OPGGS(E)R, the full text of all responses received from relevant persons, as well as sensitive information, are included in the sensitive information report provided separately to NOPSEMA to preserve the privacy of those persons or organisations consulted. Specifically, the sensitive information includes records and responses considered to contain personal information (as defined by the *Privacy Act 1988* [Cth]) or information given by a relevant person in consultation under regulation 25 of the OPGGS(E)R in the course of preparing this EP that relevant persons requested not to be published.

7.10 Assessment and response

CAPL has assessed the merits of all objections and claims regarding the consequences of the petroleum activity on a relevant persons functions, interests, or activities received during the consultation period that relate to the petroleum activity, consistent with regulation 24(b)(ii) of the OPGGS(E)R. This was done by evaluating appropriate evidence, including evidence provided by the relevant

person submitting the objection or claim, and identifying potential impacts or risks on the totality of the values and sensitivities that could be affected by the petroleum activity. Potentially adverse impacts of the petroleum activity may need to be mitigated through the application of appropriate control measures. Claims or objections not directly related to the petroleum activity (such as statements of fundamental objection to the oil and gas industry) are not considered to have merit under the OPGGS(E)R because they are not relevant to the petroleum activity itself, or the impacts and risks of the petroleum activity. However, the consultation report summarises these statements and explains why they have not been considered in preparing the EP.

A summary of the outcomes of consultation undertaken with relevant persons during the preparation of this EP is provided in Appendix E. The table provides a description of the matters, objections or claims, assessment of the merits of the objection or claim, how CAPL responded to the relevant person, and where or how any changes resulting from the consultation were incorporated into the EP.

A record of all consultation undertaken specifically for this petroleum activity is included in the engagement log, which is provided to NOPSEMA in the sensitive information report.

7.11 Summary information

Regulation 24 of the OPGGS(E)R requires that an EP contain:

- a report on all consultations under regulation 25 of any relevant person by the titleholder, that contains:
  - a summary of each response made by a relevant person
  - an assessment of the merits of any objection or claim about the adverse impact of each activity to which the EP relates
  - a statement of the titleholder's response, or proposed response, if any, to each objection or claim
  - a copy of the full text of any response by a relevant person.

Regulation 34(g)(ii) of the OPGGS(E)R requires that the EP demonstrates that "the measures (if any) that the titleholder has adopted, or proposes to adopt, because of the consultations are appropriate".

A summary of each response, CAPL's assessment of the merits of any objection or claim, and CAPL's response to each objection or claim is provided within Appendix E. The consultation summary also describes what (if any) changes to the EP, including control measures, were made in response to each objection or claim.

7.12 Conclusion on consultation

The objective of consultation, which is referred to above in Section 7.1, but reiterated below, informs whether consultation has been closed:

> *"Regulation 25, like most statutory consultation provisions, imposes an obligation that must be capable of practicable and reasonable discharge by the person upon whom it is imposed. Consultation is a "real world" activity, with specific purposes. Here, its purpose is to ensure that the titleholder has ascertained, understood and addressed all the environmental impacts and risks that might arise from its proposed activity. Consultation facilitates this outcome because it gives the titleholder an opportunity to receive information*

that it might not otherwise have received from others affected by its proposed activity. Consultation enables the titleholder to better understand how others with an objective stake in the environment in which it proposes to pursue the activity perceive those environmental impacts and risks. As the Regulations expressly contemplate, it enables the titleholder to refine or change the measures it proposes to address those impacts and risks by taking into account the information acquired through the consultations. Objectively, the scheme intends that this is likely to improve the minimisation of environmental impacts and risks from the activity."[52]

As stated above in Section 7.1, the purpose of consultation is also to:

- identify the social and cultural features of communities within the ecosystem
- inform the control measures to eliminate, reduce, and mitigate impacts and risks to those socio-cultural values and sensitivities in response to relevant persons concerns
- to inform NOPSEMA of relevant persons' identities, the nature of the consultation, and the control measures adopted[53].

Regulation 25(2) of the OPGGS(E)R requires the titleholder to give the relevant person sufficient information to allow the relevant person to make an informed assessment of the possible consequences of the activity on the functions, interests or activities of the relevant person. Regulation 25(3) of the OPGGS(E)R requires the relevant person to be afforded a reasonable period for the consultation.

Consultation is a process that is not indeterminate and must be reasonably capable of being closed once the process is complete. As Lee J stated in *Santos NA Barossa Pty Ltd v Tipakalippa "[i]t must be taken to be the regulatory intention that the consultation requirement cannot be one that is incapable of being complied with within a reasonable time."*[54]

Regulation 33(1)(a) of the OPGGS(E)R requires that if NOPSEMA is reasonably satisfied that the EP meets the criteria in regulation 34 of the OPGGS(E)R then NOPSEMA must accept the EP. Meeting these requirements is the evaluative judgment to determine reasonable satisfaction of the consultation obligation, and as such, NOPSEMA uses its discretion to determine if these criteria are met. The Full Federal Court determined that this is a state of satisfaction that is a prerequisite to an exercise of a statutory power, and that there must be an evident and intelligible justification that must be objectively ascertained by a reviewing Court[55].

CAPL has undertaken the consultation process as described in Section 7, and in doing so has met the objective of consultation as articulated in the relevant case law, and met the requirements of regulation 25. This, therefore, provides NOPSEMA with evident and intelligible justification for being reasonably satisfied that the EP acceptance criteria for consultation are met.

CAPL has completed all practicable and reasonable steps to discharge its consultation obligations. As detailed in this EP, CAPL has provided sufficient

[52] Paragraph 89 of *Santos NA Barossa Pty Ltd v Tipakalippa [2022] FCAFC 193* (Ref. 166). Note: The regulation number in the above text has been revised to reflect the OPGGS(E)R 2023, from the original Santos NA Barossa Pty Ltd v Tipakalippa [2022] FCAFC judgement transcript.

[53] Paragraphs 55–57 of *Santos NA Barossa Pty Ltd v Tipakalippa [2022] FCAFC 193* (Ref. 166).

[54] Paragraph 136 of *Santos NA Barossa Pty Ltd v Tipakalippa [2022] FCAFC 193* (Ref. 166).

[55] Paragraphs 31 and 32 of *Santos NA Barossa Pty Ltd v Tipakalippa [2022] FCAFC 193* (Ref. 166).

information (Section 7.6) and a reasonable period of time (Section 7.7) to enable relevant persons to make an informed assessment of the possible impacts and risks of the petroleum activity on their functions, interests or activities (meeting the requirements of regulation 25). The consultation process has informed CAPL's understanding of the environment, including (amongst other things) people and communities, the heritage value of places, their social and cultural features which may be affected by the proposed activities. CAPL has provided sufficient time to relevant persons to provide relevant input for CAPL to assess relevant persons claims and objections, and to action the input from relevant persons. CAPL has:

- updated its description of environment (Section 5) to include values and sensitivities raised by relevant persons
- updated its impact and risk assessment (Section 8) to include assessment of input from relevant persons on their values and sensitivities (particularly in relation to marine fauna and songlines), including revision and/or addition of control measures
- through this EP, informed NOPSEMA of relevant persons identities, the nature of the consultation, and the control measures adopted.

For further detail, see Appendix E and the sensitive information report.

CAPL notes it has discharged its obligations under regulation 25 considering:

- CAPL has implemented a thorough process to 'screen in' potential relevant persons and has allowed potential relevant persons opportunities to self-identify
- CAPL provided preliminary information on the proposed activities ahead of formal consultation to Traditional Owner representative bodies, which included an overview of the petroleum activity, location maps, timings of the activities, potential impacts and risks, and the schedule for formal consultation
- consultation on this EP commenced on 26 November 2025, and information on the activity, including information on potential impacts and risks associated with the activity, has been presented on CAPL's website during this time with the option to provide feedback online
- CAPL has maintained a toll-free contact number for persons or organisations to call and participate in consultation
- CAPL published notices in seven newspapers, as outlined in Section 7.6
- CAPL has offered face-to-face meetings with First Nations representative bodies while consulting on this EP (as outlined in Appendix E), and provided tailored and bespoke consultation material for consideration
- eight weeks was provided for consultation (Section 7.7) for this EP, with consultation closing on 20 January 2026.

CAPL has also provided a reasonable opportunity for relevant persons to engage in genuine two-way dialogue on environmental impacts and concerns, and CAPL will undertake its ongoing consultation obligations (Section 10.3.4).

Based on the above, CAPL has discharged its duty under regulation 25. CAPL considers that consultation under regulation 25 is complete.

It is noted that CAPL is not required to obtain consent from a relevant person to engage in the petroleum activity.

To the extent a relevant person says that it has further information to share or claims that consultation under regulation 25 has not completed, Appendix E provides reasons specifically why CAPL considers consultation under regulation 25 has been met in relation to that relevant person. It is noted that further information can be considered during ongoing consultation under regulation 22(15).

8 Environmental impact and risk assessment and management strategy

This section provides an evaluation of the impacts and risks associated with the petroleum activity appropriate to the nature and scale of each impact and risk, details the control measures implemented to reduce the risks to ALARP and to an acceptable level, and identifies the associated EPOs, EPSs, and MC, as required under regulations 21(5), 21(6) and 21(7) of the OPGGS(E)R.

8.1 Physical presence—Vessels, infrastructure and/or equipment

8.1.1 Source of aspect

Activities identified as having a physical presence that may interact with other marine users are the:

- long-term presence of subsea infrastructure (e.g. HXT and wellheads) within the OA
- temporary presence of MODU, vessels, and ROV/AUVs within the OA.

8.1.2 Environmental impact and risk evaluation

Interactions with other marine users may result in a:

- potential change to the functions, interests, and activities.

8.1.2.1 Consequence evaluation

8.1.2.1.1 Risk: Potential change to the functions, interests, and activities

Subsea infrastructure associated with the petroleum activity will be installed on the seabed and remain in place for the life of G&E field, resulting in potential interactions between other marine users and the wellhead or subsea equipment. This infrastructure will be entirely located within the OA. During the petroleum activity, the MODU, vessels and ROVs/AUVs will also be present within the OA. The estimated duration for the drilling campaign is 12–18 months, and contingency IMR activities (i.e. well intervention) may take up to ~50 days. The OA is located in water depths ~1,100 m–1,300 m and comprises an area of ~81 km^2.

Commercial fisheries

The temporal presence of the MODU and the use of vessels during the petroleum activity has the potential to result in a change to the functions, interests, and activities to fishing vessels.

Two fisheries, the NWSTF Commonwealth-managed commercial fishery and the Pilbara Line Fishery state-managed commercial fishery were identified as having fishing effort recorded within the OA (Table 5-20 and Table 5-21). Although these fisheries were identified as present, the level of fishing effort within the OA is typically low. Fishing activity within the Commonwealth NWSTF typically occurs in in water depths of 350–600 m (Section 5.4.1.1; Ref. 117). The entire fishery has a small number of active permits and vessels (e.g. seven permits and three vessels were active during the 2023-2024 season [Section 5.4.1.1]). For the State managed commercial fishery, fishing effort activity within the OA was only recorded in 2015 and 2016, with <3 vessels operating during that period (Section 5.4.1.2; Ref. 129). Any deviation required by fishing vessels around the

MODU (and its SNA) or the support vessels within the OA, is not expected to impact on their functions, interests, or activities.

Potential unplanned interactions between other marine users and the wellhead or subsea equipment are limited to activities where these users interact with the seabed, where the potential risks include physical damage (via entanglement) to fishing gear that contacts the infrastructure. Marine users that have the potential to interact with the subsea equipment are limited to commercial fisheries that use trawling and trapping fishing methods.

Of the commercial fisheries identified as having fishing efforts recorded within the OA (Table 5-20 and Table 5-21), only one, the NWSTF Commonwealth-managed commercial fishery, utilises these methods (trawling). The OA overlaps with ~0.02% of the total fishery management area. As previously identified, the entire fishery has a small number of active permits and vessels and it does not regularly record fishing effort within the OA (e.g. only one year [2015] out of the 10-year period [2015–2024] recorded fishing effort within the 60 nm graticular reporting block that intersected with the OA; Section 5.4.1.1).

Subsea infrastructure associated with the GFP, ~10 km west of the OA, has been in place since 2012, and to date, no incidences of commercial fishing activities interacting with the infrastructure has been communicated to CAPL. Consequently, the long-term presence of additional subsea structures is not expected to result in a significant impact to commercial fishing operations (via loss of catches or damage to fishing equipment). In addition, the temporal physical presence of the MODU and support vessels within the OA during the petroleum activity is also expected to have limited potential impacts on their functions, interests, or activities.

Based on the low fishing effort within the OA, limited spatial overlap, and the temporary nature of the MODU and support vessels presence, any changes to the functions, interests, and activities to commercial fisheries are expected to be limited. As such, CAPL has ranked this risk as Incidental (6).

Commercial shipping

The temporal presence of the MODU and the use of vessels during the petroleum activity has the potential to result in a change to the functions, interests, and activities to shipping vessels.

The OA is located outside major shipping fairways, and commercial vessel traffic is expected to remain within the fairways and, therefore will not typically coincide with the OA (Section 5.4.4). Therefore, the temporary presence of the MODU and support vessels within the OA are not expected to affect commercial shipping operations. Any deviation required by commercial shipping operators is not expected to impact on their functions, interests, or activities. Therefore, CAPL has ranked the potential change to the functions, interests, and activities to commercial shipping activities as Incidental (6).

8.1.2.2 Control measures

Table 8-1 describes the good practice control measures relevant to this aspect.

Table 8-1: Good practice control measures relevant to physical presence—vessels, infrastructure and/or equipment

Control measure	Description
CM-01: Maritime safety information	Maritime safety information, such as AUSCOAST navigational warnings, are issued by the Joint Rescue Coordination Centre (JRCC) Australia, part of AMSA. Under the *Navigation Act 2012* (Cth), the AHO is also responsible for maintaining and disseminating navigational charts and publications, including providing safety-critical information to mariners (including any change to prohibited/restricted areas, obstructions to surface navigation, etc.) via the Notice to Mariners system. Notice to Mariners can be permanent or temporary notifications. Maritime safety information (radio-navigation warnings and/or Notice to Mariners will be issued; thus, enabling other marine users to also safely plan their activities.
CM-02: Marine Order 27	Marine Order 27—Safety of navigation and radio equipment sets out requirements for safe navigation, radio equipment and communications. The AIS is a maritime communications device, and AIS equipped vessels (shipborne AIS) can use it to send and receive identifying information. This identifying information can be displayed on an electronic chart, computer display, chart plotter or compatible navigation radar. As such, this identifying information can: • aid in situational awareness • provide a means to assist in collision avoidance.
CM-03: Marine Order 28	Marine Order 28—Operations standards and procedures sets out requirements and responsibilities for vessel crew, including watchkeeping standards.
CM-04: Marine Order 30	Marine Order 30—Prevention of collisions and section 176 of the *Navigation Act 2012* (Cth) gives effect to the COLREGS, which has lighting and signal requirements for vessels. These requirements include the use of appropriate lights and shapes to reflect the nature of vessel activities (e.g. restricted in the ability to manoeuvre, vessels underway, etc.). These requirements ensure other marine users in the vicinity are aware of the nature of the vessel activities.
CM-05: Control of Work (CoW) process	CAPL's Operations Process: CoW Process (Ref. 179) ensures that workplace safety and health hazards are assessed and managed. The work authorisation system is part of this process and includes SIMOPS and hazard analysis. Where required under the CoW process, a SIMOPS Plan will be developed to identify and manage hazards arising from the petroleum activity and other CAPL planned petroleum activities when occurring within the same area.
CM-06: Relevant persons consultation—Ongoing consultation (notification)	Communicating the activity details, location, requested SNA (i.e. 500 m radius buffer around the MODU), and presence of vessels to other marine users ensures they are informed and aware, thereby reducing the risk of unplanned interactions. In addition to consultation undertaken during the preparation of this EP (as required by regulation 25 of the OPGGS(E)R, and described in Section 7), where requested, as part of ongoing consultation (as required by regulation 22(15) of the OPGGS(E)R, and described in Section 10.3.4) relevant persons that have requested ongoing notifications will also be notified of to the commencement and completion of the petroleum activity (Table 10-7).

Table 8-2: Additional control measures evaluated for physical presence—vessels, infrastructure and/or equipment

Control measure	Benefit	Cost
Vessel Lookahead Report	The provision of vessel lookahead reports for drilling activities under this EP may assist commercial	N/A

Control measure	Benefit	Cost
	fishers and/or fishing industry organisations in understanding the specific locations of the MODU or vessels within the next 48-hour period. This may assist fishers in targeting grounds away from proposed petroleum activities, thereby reducing the potential for interaction and/or damage to fishing equipment. However, similar outcomes would be achieved through existing related controls: • Under **CM-01** marine safety information would be issued, including a request for a 500 m SNA around the MODU • Under **CM-06** specific activity commencement and completion notifications would be issued to those that requested these notifications during relevant persons consultation. Given the small spatial extent of the OA that may overlap with potential trawling fishing areas and the limited fishing effort recorded in the area, the use of vessel lookahead reports is considered to provide negligible environmental benefit and would not significantly reduce the residual risk. This control has not been adopted for use, and no further evaluation has been undertaken.	

8.1.2.3 ALARP justification

Offshore drilling and support vessel operations are commonplace and well-practised both nationally and internationally. The control measures to manage the risks associated with unplanned interactions with other marine users are well defined and understood by the industry, including CAPL.

During relevant persons consultation, claims were raised regarding physical presence, including:

- access rights to fishing areas
- damage or loss of commercial fishing gear
- vessel traffic within the region and notification requirements with AMSA and AHO and anti-collision measures.

CAPL responded to these claims (see summary in ‘external context’ [Section 8.1.3] and within Appendix E).

Based on the environmental risk evaluation and application of relevant assessment tools as commensurate with the predicted level of risk (e.g. lower-order risks), CAPL considers the adopted good practice control measures (Section 8.1.2.2) are appropriate to manage the potential risks from the physical presence of vessels, infrastructure and/or equipment. No further reasonably practicable control measures were identified that would provide a meaningful

reduction in environmental risk without incurring grossly disproportionate costs. Accordingly, CAPL considers the potential environmental risks associated with this aspect to be reduced to ALARP.

8.1.2.4 Likelihood and risk level summary

Due to the nature and scale of the MODU and vessel activities within the scope of this EP and the limited spatial area of activities, the likelihood of interaction with other marine users is considered low. Interaction with the wellhead or subsea equipment is also expected to be limited based upon infrastructure location and CAPL's operational experience. As such, CAPL has assessed the likelihood and risk level as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential change to the functions, interests, and activities			
Commercial fisheries	Incidental (6)	Unlikely (4)	Very Low (9)
Commercial shipping	Incidental (6)	Unlikely (4)	Very Low (9)

8.1.3 Demonstration of acceptability

Table 8-3 describes the demonstration of acceptability relevant to this aspect.

Table 8-3: Demonstration of acceptability relevant to physical presence—vessels, infrastructure and/or equipment

Comparison with acceptable level	
Acceptable level AL-18 is applicable to vessels, infrastructure and/or equipment physical presence for the petroleum activity (refer to Section 6.7). The physical presence associated with vessels, infrastructure and/or equipment has been assessed as having an Incidental (6) consequence (Section 8.1.2.1), and limited interactions with no lasting effects on the functions, interests, or activities of other marine users in the OA. Therefore, the predicted level of impact will be managed to be equivalent or better than the acceptable level.	
Principles of ESD	
Precautionary Principle In accordance with Table 6-2, a consequence level of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required.	
Relevant environmental legislation and other requirements	
Legislation and other requirements considered relevant for this aspect include: • *Navigation Act 2012* (Cth). CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:	
Requirement	**Demonstration**
Navigation Act 2012 (Cth) Notice to Mariners	Requirement to issue a Notice to Mariners has been incorporated into the **maritime safety information** control measure
Navigation Act 2012 (Cth) Use of AIS as per Marine Order 27	The use of shipborne AIS has been incorporated into the **AIS** control measure

Navigation Act 2012 (Cth) Vessel watchkeeping as per Marine Order 28	Vessel watchkeeping requirements has been incorporated into the **watchkeeping** control measure
Navigation Act 2012 (Cth) Use of lights and signals as per COLREGS and Marine Order 30	Requirement to exhibit appropriate lights and signals to reflect the nature of vessel operations has been incorporated into the **vessel lights and signals** control measure

Internal context

These management processes were deemed relevant for this aspect:

- *Control of Work Process* (Ref. 179).

Control measures related to the above management process have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.

External context

During relevant persons consultation, the following claims were raised:

- concerns regarding potential impacts on fishing areas and fishers' access rights to fishing areas. CAPL provided a response that confirmed:
  - no permanent exclusion zones will be sought for the new production wells
  - marine notices will be issued prior to the petroleum activity commencing within the OA. This has been covered by the control measure **maritime safety information, Relevant persons consultation— Ongoing consultation** and notification requirements (refer to Table 10-7).
- concerns regarding the risk of damage or loss of commercial fishing gear as a result of this petroleum activity. CAPL provided a response that confirmed:
  - navigational charts will identify the location of infrastructure once drilling activities have been completed to enable avoidance and risk management by operators in the area
  - marine notices will be issued prior to the petroleum activity commencing within the OA. This has been covered by the control measure **maritime safety information, Relevant persons consultation— Ongoing consultation** and notification requirements (refer to Table 10-7)
  - given the proposed control measures and the very low likelihood interaction with commercial fisheries, no compensation protocols are intended to be established for this petroleum activity.
- concerns regarding vessel traffic within the region, notification requirements with AMSA and AHO and anti-collision measures. CAPL acknowledged the provided information regarding vessel traffic in the region. CAPL also provided a response that confirmed:
  - the information is considered within the EP in Section 5.4.4.
  - notification requirements and vessel collision controls are standard in EPs and are already contained within the EP. This has been covered by the control measures listed in Section 8.1.2.2 and notification requirements (refer to Table 10-7).

No further objections or claims were raised regarding interaction with other marine users arising from the activity.

8.1.4 Environmental performance

Table 8-4 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-4: Environmental performance relevant to physical presence—vessels, infrastructure and/or equipment

EPO	Control measure	EPS	MC
EPO-33: No interference with other lawful marine users from planned activities associated with the petroleum	**CM-01:** Maritime safety information	**EPS-01.1:** MODU and vessels operating within the OA will comply with any Notice to Mariners requirements under	**MC-01.1:** Records of lodgement of notification to relevant agency.

EPO	Control measure	EPS	MC
activity to a greater extent than is necessary for the reasonable exercise of the rights and performance of duties.		the *Navigation Act 2012* (Cth).	
		EPS-01.2: CAPL will comply with any Notice to Mariners requirements under the *Navigation Act 2012* (Cth) regarding notifications of installed subsea infrastructure.	**MC-01.2:** Records of lodgement of notification to relevant agency.
	CM-02: Marine Order 27	**EPS-02:** MODU and vessels will use shipborne AIS during the petroleum activity.	**MC-02:** Records indicate that shipborne AIS was used by the MODU and vessel/s during the petroleum activity.
	CM-03: Marine Order 28	**EPS-03:** MODU and vessels will implement watchkeeping standards in accordance with Marine Order 28.	**MC-03:** Records indicate that watchkeeping was undertaken in accordance with the requirements of Marine Order 28 during the petroleum activity.
	CM-04: Marine Order 30	**EPS-04:** In accordance with regulatory requirements, MODU and vessels will implement light and signals appropriate to the nature of their operations.	**MC-04:** Records indicate that vessel lights and signals were consistent with the requirements of COLREGS and the *Navigation Act 2012* (Cth) during the petroleum activity.
	CM-05: CoW process	**EPS-05:** Where required under the CoW process, CAPL will develop and implement SIMOPS Plan(s) to manage the petroleum activity and other planned CAPL petroleum activities that may occur concurrently within the vicinity of the OA.	**MC-05:** Records indicate that if other concurrent CAPL activities within the OA are identified, a SIMOPS Plan will be developed and in place prior to the petroleum activity commencing.
	CM-06: Relevant persons consultation—Ongoing consultation (notification)	**EPS-06:** Relevant persons that have requested notifications will be advised of the commencement and expected completion dates.	**MC-06:** Relevant persons consultation Records.

8.2 Physical presence—Seabed disturbance

8.2.1 Source of aspect

Activities identified as having the potential to result in seabed disturbance are:

- installation of subsea equipment and contingency activities during drilling campaign
- IMR (contingency)–as required by maintenance and repair activities (e.g. well intervention)
- MODU positioning due to the temporary presence of transponders and clump weight (if used) on the seabed
- temporary ROVs/AUVs wet parking and vessel anchoring during emergencies.

8.2.2 Environmental impact and risk evaluation

Seabed disturbance may result in a:

- localised and temporary change in water quality
- localised alteration of BCH
- potential adverse effect to unknown UCH sites and/or artefacts.

8.2.2.1 Consequence evaluation

8.2.2.1.1 Impact: Localised and temporary change in water quality

A change in water quality is expected to occur when seabed sediments are disturbed and become suspended in the water column during placement of subsea equipment, or during MODU positioning (as identified in Section 8.2.1). These impacts are expected to be localised to around the area of seabed disturbance. After the activities are completed, sediments will gradually settle back to the seabed and water quality will return to background levels.

The area of seabed disturbance within the OA is limited, and is related to discrete, intermittent activities (i.e. not occurring continually for the duration of the petroleum activity). Given the hydrodynamics in open ocean areas, the area of decreased water quality is expected to be localised and temporary, as sediments would settle out of the water column relatively quickly (Ref. 212). As such, CAPL has ranked the consequence as Incidental (6).

8.2.2.1.2 Impact: Localised alteration of BCH

BCH may be altered via physical disturbance or indirectly by the temporary increase in suspended sediment near the seabed, resulting from seabed disturbance.

The disturbance footprint of the top-hole at each well is <0.01 km^2, with a total disturbance of <0.06 km^2. The temporary presence of transponders and ROV/AUV wet parking (if required) may generate a small additional disturbance footprint, ~0.8 m^2 (assuming four transponders per well) and <15 m^2, respectively.

Although vessel anchoring is not a routine activity, it has been carried through as a contingency in the event that anchoring is required within the OA due to a significant weather event. National Energy Resources Australia (Ref. 212) indicates that the disturbance footprint from an anchoring system (including anchors and chains) for a vessel in water depths >70 m is estimated to be up to

~0.013 km^2. Assuming two vessels are required to anchor, the indicative seabed disturbance area would be <0.03 km^2.

Consequently, the total disturbance footprint (for both planned and contingency activities) is expected to be ~0.1 km^2. The OA has an area of ~81 km^2, indicating that seabed disturbance would represent <0.13% of the OA.

As described in Section 5.3.1.1, the OA is primarily comprised of smooth seabed with bioturbation and scattered patches of bedforms with bare substrate. Ground truthing confirmed the absence of complex seafloor structures and did not identify any epifaunal communities or benthic infauna around the proposed DC (Ref. 33). In addition, the OA does not overlap any KEFs and no site-attached species are expected due to the absence of suitable habitat in the OA (Section 5.3.3.3; Ref. 78).

Dernie et al. (Ref. 213) reported that full recovery of soft sediment assemblages, characterised by sandy sediments, from anthropogenic physical disturbance could take 64–208 days, depending on the intensity of the disturbance.

Given the nature of the activities and the characteristics of the receiving environment within the OA, seabed disturbance is expected to be highly localised and is not expected to affect ecosystem function or habitat connectivity. Disturbance to BCH is anticipated to recover within days to months following the short-term disturbance associated with the temporary presence of equipment (e.g. transponders) or wet parking; therefore, it was evaluated as Incidental (6). While the disturbance footprint of the subsea infrastructure (e.g. wellheads) is relatively small (<0.06 km^2), as this presence will be long term the localised alteration to BCH was evaluated as Moderate (4).

8.2.2.1.3 Risk: Potential adverse effects to unknown UCH sites and/or artefacts

During the petroleum activity, discovery of, and unintended disturbance to, unknown UCH may occur.

Given known sea level history, areas in water depths of <125 m would have been emergent land during the extended history of First Nations occupation of Australia. The OA occurs in water depths >1,100 m. Consequently, the OA would not have been emergent land during the history of First Nations occupation and the potential for unknown First Nations UCH is not considered credible and no further assessment has been undertaken.

As identified in Section 5.6.2, there are no known UCH sites and/or artefacts within the OA, and the probability of encountering any historic UCH is low. The OA has an area of ~81 km^2 and the seabed disturbance is expected to be <0.13% of the OA (Section 8.2.2.1.2).

Given the highly localised nature of seabed disturbance and the low probability of encountering historic UCH, the discovery of, and unintended disturbance to, unknown UCH is not expected. However, should such an event occur, any potential disturbance is expected to be limited. Therefore, CAPL has ranked potential adverse effect to unknown UCH as Incidental (6).

8.2.2.2 Control measures

Table 8-5 and Table 8-6 describe the control measures relevant to this aspect.

Table 8-5: Good practice control measures relevant to physical presence—seabed disturbance

Control measure	Description
CM-07: Visual inspection	A visual inspection (via ROV or AUV) of the seabed will be undertaken prior to well spudding activities commencing
CM-08: Disturbance limit	The Gorgon Backfill Fields Development OPP (Ref. 3) estimated areas of long-term and short-term disturbance for the Backfill Fields Development; the total estimated area of disturbance was 19.84 km^2. This petroleum activity is part of the Backfill Fields Development, and will have areas of seabed disturbance. With respect to the petroleum activity within scope of this EP: • the long-term disturbance area comprises a 250 m radius buffer around the G&E DC; this area allows for the long-term presence of infrastructure (e.g. wellheads and subsea trees) • the short-term disturbance area allows for the temporary placement of equipment (e.g. transponders) that may be required outside the long-term disturbance area • an additional 50% contingency (as per the approach in the OPP) allowance for both the long-term and short-term disturbance area. Note: Where temporary equipment contacts the seabed within the long-term disturbance area, it is implicitly accounted for in the long-term disturbance area (i.e. the two areas are discrete, not overlapping).
CM-09: Subsea inventory	Develop and maintain an inventory of subsea assets.
CM-10: UCH Procedure	The *Inadvertent Underwater Cultural Heritage Discovery Procedures* (Ref. 214) has been developed in alignment with the *Guidelines for Assessing and Managing Impacts to Underwater Cultural Heritage in Australian Water* (Ref. 9). The UCH Procedure (Ref. 214) will be implemented where there are activities interacting with the seabed with the risk of disturbing unlocated UCH. The UCH Procedure (Ref. 214) ensures that inadvertent discoveries of UCH (including First Nations UCH) are identified on site and responded to with adequate conservation and management actions. The Procedure will identify actions to be taken should potential UCH be identified within the OA.

Table 8-6: Additional control measures evaluated for physical presence—seabed disturbance

Control measure	Benefit	Cost
CM-11: No anchoring of vessels within the OA during planned activities	Elimination of vessel anchoring would reduce the potential for seabed disturbance from this activity and any associated potential environmental impacts and risks. However, allowing anchoring only in unplanned or emergency situations maintains the ability to protect personnel, vessels, and infrastructure should unforeseen circumstances arise. Restricting anchoring to these situations therefore significantly reduces the potential for seabed disturbance while maintaining the ability to respond to unplanned events.	Negligible. The activity has been designed to be undertaken without planned anchoring and implementation of this control does not result in a material increase in cost or operational complexity. The costs associated with implementing this control measure are not considered grossly disproportionate to the environmental benefit gained. Therefore, it has been adopted for use.

8.2.2.3 ALARP justification

Seabed disturbance from petroleum activities is commonplace; the activities causing this aspect are practised nationally and internationally. The control

measures to manage the impacts associated with seabed disturbance are well understood and implemented by the industry, including CAPL.

During relevant persons consultation, no objections or claims were raised regarding seabed disturbance arising from the petroleum activity.

Based on the environmental impact and risk evaluation and application of relevant assessment tools as commensurate with the predicted level of impact and risk (e.g. lower-order impacts and risks), CAPL considers the adopted good practice and additional control measures (Section 8.2.2.2) are appropriate to manage the potential impacts and risks from seabed disturbance. No further reasonably practicable control measures were identified that would provide a meaningful reduction in environmental impact or risk without incurring grossly disproportionate costs. Accordingly, CAPL considers the potential environmental impacts and risks associated with this aspect to be reduced to ALARP.

8.2.2.4 Likelihood and risk level summary

Due to the limited area of seabed disturbance, and with the control measures in place, CAPL has assessed the likelihood and risk level as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential adverse effects to unknown UCH sites and/or artefacts			
UCH sites and/or artefacts	Incidental (6)	Rare (6)	Very Low (10)

8.2.3 Demonstration of acceptability

Table 8-7 describes the demonstration of acceptability relevant to this aspect.

Table 8-7: Demonstration of acceptability relevant to physical presence—seabed disturbance

Comparison with acceptable level
Acceptable levels AL-01, AL-02 and AL-04 are applicable to seabed disturbance associated with the petroleum activity (refer to Section 6.7). Potential impacts from seabed disturbance were predicted to range from a short-term, direct reduction in water quality within a localised area, to localised impacts to BCHs (Section 8.2.2.1). Therefore, it is not expected to affect biological diversity and ecosystem integrity. Consequently, the predicted level of impact will be managed to be equivalent or better than the acceptable levels AL-01 and AL-02. In addition, no impacts to known tangible seabed-based cultural heritage are expected. An UCH assessment will be undertaken prior to the final field layout design to identify and report any suspected UCH and to ensure these areas are avoided. Therefore, the predicted level of impact will be managed to be equivalent or better than the acceptable level AL-04.
Principles of ESD
Precautionary Principle In accordance with Table 6-2, consequence levels ranging from Incidental (6) to Moderate (4) do not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, consequence levels ranging from Incidental (6) to Moderate (4) do not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required. *Biodiversity Principle* The impacts and risks associated with this aspect include localised seabed disturbance, which is not expected to represent a threat of serious or irreversible environmental damage. As such, this

aspect is not considered as having the potential to affect biological diversity and ecological integrity.
Relevant environmental legislation and other requirements
No legislation or other requirements were considered relevant to this aspect.

Requirement	Demonstration
N/A	N/A

Internal context
No CAPL management processes or procedures were deemed relevant for this aspect.
External context
During relevant persons consultation, no objections or claims were raised regarding seabed disturbance arising from the petroleum activity.

8.2.4 Environmental performance

Table 8-8 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-8: Environmental performance relevant to physical presence—seabed disturbance

EPO	Control measure	EPS	MC
EPO-01: Planned seabed disturbance within the OA will not cause lasting changes to water quality (total suspended solids). Water quality will return to ambient state within seven days following the cessation of the disturbance. **EPO-04:** Long-term direct disturbance from the Gorgon Backfill Fields Development is limited to 18.85 km^2 within the Development Area[56]. **EPO-05:** Short-term direct disturbance from the Gorgon Backfill Fields Development is limited to 0.98 km^2 within the Development Area[56].	**CM-07**: Visual inspection	**EPS-07:** A visual inspection of the seabed will be undertaken prior to well spudding activities commencing.	**MC-07:** Records verify that a visual seabed inspection was undertaken prior to well spudding.
	CM-08: Disturbance limit	**EPS-08:** Planned seabed disturbance from the petroleum activity will be within the spatial extents of either the 'long-term disturbance area' or the 'short-term disturbance area' as defined in the Gorgon Backfill Fields Development OPP (Ref. 3).	**MC-08:** Records verify that planned seabed disturbance was within the spatial extents defined in the OPP.
	CM-09: Subsea inventory	**EPS-09:** Maintain an inventory of subsea assets within CAPL-operated petroleum titles.	**MC-09:** Records verify that new assets have been added to the subsea assets inventory.
	CM-11: No anchoring of vessels within the OA during planned activities	**EPS-11:** No anchoring of vessels within the OA during planned activities.	**MC-11:** Records show vessel position maintained through DP or other station-keeping methods during planned activities.

[56] Where an EPO refers to the 'Development Area', this is Development Area for the Backfill Fields Development as defined within Section 4.1.3 of the OPP (Ref. 3).

EPO	Control measure	EPS	MC
EPO-08: No adverse impacts to declared UCH without a permit[57] from planned activities associated with the petroleum activity.	**CM-10**: UCH Procedure	**EPS-10.1:** Implement CAPL's *Inadvertent Underwater Cultural Heritage Discovery Procedures* (Ref. 214), including processes for notification and response to suspected discoveries.	**MC-10.1.1:** Induction materials include relevant UCH requirements.
			MC-10.1.2: Records show if UCH (or potential UCH) were identified within the OA, conservation and management actions were implemented.
		EPS-10.2: Discovery of suspected UCH is reported to the Minister within 21 days of discovery as per section 40 of the UCH Act 2018 (Cth).	**MC-10.2:** Record of lodgement of notification to relevant agency, if suspected UCH was discovered.
		EPS-10.3: If First Nations UCH (or potential UCH) is identified during the petroleum activity, the finding will be shared with the relevant First Nations representative bodies.	**MC-10.3:** Relevant persons consultation records confirm that information has been shared with First Nations representative bodies.

8.3 Planned emissions—Atmospheric

8.3.1 Source of aspect

Activities identified as having the potential to generate atmospheric emissions are:

- contingency cold venting during drilling and completion activities
- cold venting during contingency well abandonment or well suspension activities
- cold venting and flaring during contingency well intervention activities
- combustion of fuel from planned MODU, vessels, and helicopter activities.

8.3.2 Environmental impact and risk evaluation

Atmospheric emissions may result in:

- a localised and temporary reduction in air quality.

8.3.2.1 Consequence evaluation

Section 8.2.2 of the NOPSEMA-accepted Gorgon Backfill Fields Development OPP provides an evaluation of potential impacts from atmospheric emission. As this petroleum activity forms part of the Backfill Fields Development (the offshore project), the planned emissions are of a similar (or smaller) nature and scale, and the relevant receptors are the same as those previously assessed, the

[57] Where a permit refers to a permit granted under section 23 of the UCH Act.

consequence evaluation for this EP is considered covered by consequence evaluation within Section 8.2.2 of the OPP. In accordance with regulation 56(1) of the OPGGS(E)R, as this information has been previously supplied and is publicly available[58] it is not repeated here.

The consequence evaluation for a localised and temporary reduction in air quality has been assessed as Incidental (6).

8.3.2.2 Control measures

Table 8-9 describes the good practice control measures relevant to this aspect.

Table 8-9: Good practice control measures relevant to planned emissions—atmospheric

Control measure	Description
CM-12: Marine Order 97	Marine Order 97— Marine pollution prevention—air pollution (2022) sets out requirements for the prevention of air pollution by vessels. Prior to commencement of the petroleum activity, Chevron's Offshore Vessel Information System (OVIS) requirements within the *Chevron Shipping's Marine Standard Non Tankers: Corporate OE Standard* (Ref. 180) are used to verify that vessels comply with relevant Marine Order 97—Marine pollution prevention— air pollution (2022) requirements, including: • relevant vessels (as defined in regulation 6 of MARPOL 73/78 Annex VI) will hold a valid International Air Pollution Prevention (IAPP) certificate and/or international energy efficiency (IEE) certificate • marine diesel engines with >13 kW power output installed on a vessel will comply with nitrous oxides (NOx) emission levels as per regulation 13 of MARPOL 73/78 Annex VI • marine diesel engines >130 kW power output on relevant Australian vessels will have an Engine International Air Pollution Prevention (EIAPP) certificate as per Division 7 of Marine Order 97 (2022) • relevant vessels (as defined in Chapter 4 of MARPOL 73/78 Annex VI) will have: – an Energy Efficiency Design Index (EEDI) or Energy Efficiency Existing Ship Index (EEXI) and comply with relevant reduction factors – a Ship Energy Efficiency Management Plan (SEEMP) – a Carbon Intensity Indicator (CII) and comply with relevant reduction factors. • sulphur content of fuel is within prescribed limits.

8.3.2.3 ALARP justification

MODU, vessel and helicopter operations are routinely undertaken across the offshore petroleum industry, both nationally and internationally. The potential impacts associated with atmospheric emissions from these types of activities are managed through established control measures prescribed by applicable legislation and recognised as standard industry practice. These requirements are well understood and implemented by the petroleum industry, including by CAPL.

During relevant persons consultation, no objections or claims were raised regarding atmospheric emissions arising from the petroleum activity

[58] The NOPSEMA-accepted Gorgon Backfill Fields Development OPP is available online at: https://docs.nopsema.gov.au/A1265361. Section 8.2.2 of the Gorgon Backfill Fields Development OPP provides the consequence evaluation of the potential impacts from atmospheric emissions.

Based on the environmental impact evaluation and application of relevant assessment tools as commensurate with the predicted level of impact (e.g. lower-order impacts), CAPL considers the adopted good practice control measures (Section 8.3.2.2) are appropriate to manage the potential impacts from atmospheric emissions. No reasonably practicable additional control measures were identified that would provide a meaningful reduction in environmental impact. Accordingly, CAPL considers the potential environmental impacts associated with this aspect to be reduced to ALARP.

8.3.3 Demonstration of acceptability

Table 8-10 describes the demonstration of acceptability relevant to this aspect.

Table 8-10: Demonstration of acceptability relevant to planned emissions—atmospheric

Comparison with acceptable level	
Acceptable level AL-01 is applicable to atmospheric emissions associated with the petroleum activity (refer to Section 6.7). Atmospheric emissions from the petroleum activity are predicted to result in a localised and temporary reduction in air quality (Section 8.3.2.1). Therefore, the predicted level of impact can be managed to be equivalent or better than the acceptable level.	
Principles of ESD	
Precautionary Principle In accordance with Table 6-2, a consequence level of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required. *Biodiversity Principle* The impact associated with this aspect is a localised and temporary reduction in air quality, which are not considered to have the potential to affect biological diversity and ecological integrity	
Relevant environmental legislation and other requirements	
Legislation and other requirements considered relevant for this aspect include: • *Marine Order 97 2022* • *Navigation Act 2012 (Cth)*. CAPL considers that impact management is consistent with these requirements, as demonstrated below:	
Requirement	**Demonstration**
Marine Order 97 2022 Gives effect to Annex VI of MARPOL 73/78.	IAPP and IEE certificate (as per Division 3), nitrogen oxides emission requirements (as per Division 7), and energy efficiency requirements (as per Division 9) have been incorporated into the **Marine Order 97** control measure.
Navigation Act 2012 (Cth) – Chapter 4 (Prevention of Pollution) Aims to protect the marine environment from discharges associated with ships within Australian waters that may result in pollution to the marine environment and gives effect to Annex VI of MARPOL 73/78.	
Internal context	
This management processes or procedures was deemed relevant for this aspect: • *Chevron Shipping's Marine Standard Non Tankers: Corporate OE Standard* (Ref. 180)	

Control measures related to the above management process or procedure have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.
External context
During relevant persons consultation, no objections or claims were raised regarding atmospheric emissions arising from the petroleum activity.

8.3.4 Environmental performance

Table 8-11 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-11: Environmental performance relevant to planned emissions—atmospheric

EPO	Control measure	EPS	MC
EPO-10: Planned air emissions within the OA will not cause lasting changes to air quality. Air quality will return to ambient state within seven days following the cessation of the emission.	**CM-12:** Marine Order 97	**EPS-12:** Prior to commencement of vessel-based activities within the OA, the following will be verified: • relevant vessels (as appropriate to class) will hold a valid IAPP and/or IEE certificate • relevant marine diesel engines on vessels will comply with NOx emission levels and/or have an EIAPP certificate • relevant vessels (as appropriate to class) will have a SEEMP, EEDI/EEXI, and/or CII • sulphur content of fuel is within prescribed limits.	**MC-12:** OVIS report, ABU Marine OE Inspection Checklist, or equivalent record confirms vessels hold appropriate certificates and/or plans, marine diesel engines comply with NOx emission levels, and sulphur content of fuel is within prescribed limits.

8.4 Planned emissions—GHG

8.4.1 Source of aspect

Activities identified as having the potential to result in GHG emissions are:

- contingency cold venting during drilling and completion activities
- cold venting during contingency well abandonment or well suspension activities
- cold venting and flaring during contingency well intervention activities
- combustion of fuel from planned MODU, vessels, and helicopter activities.

8.4.2 Emissions inventory

The GHG Protocol identifies ‘relevance’ as one of the principles of GHG accounting and reporting, of which an integral aspect is defining an appropriate

GHG emissions inventory boundary that serves the decision-making needs of the users (Ref. 215).

The purpose of this GHG emissions inventory is to inform the environmental impact assessment within this EP. Therefore, this GHG emissions inventory is bound by the scope of the petroleum activity as described in Section 4. Unplanned events (e.g. major repairs or responding to an emergency event) are considered out of scope of the inventory.

Within this EP, GHG emissions that are a direct consequence of planned works that comprise the petroleum activity (as described in Section 4) from sources within the OA in Commonwealth waters are termed **petroleum activity GHG emissions**.

NOPSEMA has requested titleholders, in having regard of the *EPBC Act Policy Statement—'Indirect consequences' of an action: Section 527E of the EPBC Act* (hereafter referred to as the EPBC Indirect Consequences Policy; Ref. 216), assess GHG emissions that constitute 'direct consequences' as well as GHG emissions that may constitute 'indirect consequences' of the petroleum activity be included in the GHG emissions inventory.

There are no GHG emissions identified as an indirect consequence of the petroleum activity within scope of this EP because:

- there is no recovery of hydrocarbons associated with the production drilling activities, nor are the wells connected to a hydrocarbon recovery system
- there are other subsequent petroleum activities that must be authorised under the OPGGS(E)R before hydrocarbon recovery could occur.

Therefore, production drilling is not considered to be a substantial cause or facilitate to a major extent any future GHG emissions that may be associated with the gas processing, transport, or third-party end use of hydrocarbons.

GHG emissions have been calculated based on the methods described in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008* (Cth) for the combustion of liquid fuels and flaring, and on methods described in the A*PI Compendium of Greenhouse Gas Emissions Methodologies* (Ref. 217) for cold venting. Table 8-12 provides a summary of the assumptions regarding sources (e.g. numbers and/or types of vessels) and durations that were used when developing this GHG emissions inventory.

Based on the described GHG inventory boundary and calculation methods, the estimate of total **petroleum activity GHG emissions** is ~0.13 Mt CO_2-e.

Table 8-12: Data inputs and assumptions for GHG inventory calculations

Inputs and assumptions
Drilling (planned and contingency)
Production well drilling: • duration of drilling activities is expected to take ~12–18 months (Section 4.1.2)   – for calculation purposes conservatively assumed a MODU plus two PSVs present within the OA for 18 months duration • an MSV may be used to install the HXTs (Section 4.2.7); for calculation purposes assumed an MSV may be present within the OA for ~40 days • helicopter flight frequency is estimated to be ~5 flights per week for the duration of the drilling campaign (Section 4.4.3)

Inputs and assumptions
• estimated fuel consumption for DP drillship, PSVs, MSVs, and helicopter based on reported data from previous CAPL activities. **Contingency flaring and venting (during drilling campaign)**: • flaring and/or cold venting is not planned but may be required during drilling and completion activities (Section 4.2.11.4) • for calculation purposes conservatively assumed an allowance of ~1.5 MMscf of natural gas per production well – as flaring infrastructure is not intended to be installed during GS3 drilling and completion activities, venting has been assumed for calculation purposes – an approximate gas composition of 90% CH_4 and 2% CO_2 (based on rounded-up molar proportions of Geryon and Eurytion gas constituents as per Table 4-2) – the assumed volume represents a single non-additive inventory-based release (i.e. typical well bore and land string volume). **Contingency venting (during well suspension or well abandonment)**: • well suspension or abandonment are not planned, but if required this may also include cold venting of small volumes of natural gas (Sections 4.2.11.1 and 4.2.11.5) • for calculation purposes conservatively assumed ~1.5 MMscf of natural gas per well (based on a typical volume within the landing string) – with an approximate gas composition of 90% CH_4 and 2% CO_2 (based on rounded-up molar proportions of Geryon and Eurytion gas constituents as per Table 4-2) • given both well suspension and well abandonment are contingency activities within this EP, GHG emissions have only been estimated once as part of this inventory.
Subsea inspection (contingency)
IMR—subsea inspections: • subsea inspections are a contingency activity; for the purpose of the EP an allowance for a single 7-day inspection has been included (Sections 4.1.2 and 4.3) • one IMR vessel present within the OA for full duration of inspection activities • fuel consumption for an IMR vessel based on reported data from previous CAPL activities.
Well intervention (contingency)
IMR—well intervention: • well interventions are a contingency activity; for the purpose of the EP an allowance for a single 50-day intervention campaign has been included (Sections 4.1.2 and 4.3) • for calculation purposes conservatively assumed a well intervention vessel plus two PSVs present within the OA for the full duration • helicopter flight frequency is estimated to be ~5 flights per week • estimated fuel consumption for well intervention vessel, PSVs, and helicopter based on reported data from previous CAPL activities • flaring during well intervention is typically planned and requires dedicated equipment to be installed – for calculation purposes conservatively assumed~60 MMscf (~1,260 tonnes[59]) of natural gas flared • cold venting may occur during well intervention activities; for calculation purposes conservatively assumed ~1.5MMscf of natural gas is cold vented.

8.4.3 Relevant GHG legislative and policy framework

The following subsections are specifically relevant to the GHG emissions legislative framework and are intended to be read in combination with the information in Section 3.2.

[59] Estimated volume of natural gas is based on an approximate conversion factor of 1 MMscf = 21 tonnes (Ref. 218).

8.4.3.1 Paris agreement

Australia is party to, and has ratified, the Paris Agreement. The Paris Agreement is an international treaty on climate change that entered into force in November 2016 (Ref. 219). Article 2 of the Paris Agreement states that it "aims to strengthen the global response to the threat of climate change, in the context of sustainable development and the efforts to eradicate poverty, including by … holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change" (Article 2; Ref. 220).

Australia submitted its first Nationally Determined Contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015 and submitted an update in July 2022. This revised NDC commits Australia to reducing GHG emissions by 43% below 2005 levels by 2030 (Ref. 221). This 2030 commitment is both a single-year 'point' target to reduce emissions 43% below 2005 levels by 2030, and a multi-year 'emissions budget' from 2021–2030 (based on a 43% reduction by 2030, the indicative emissions budget for this period is 4,353 Mt CO_2-e)[60]. In September 2025 Australia submitted its second NDC to the UNFCCC. Australia's 2035 commitment is a "[r]eduction in net national greenhouse gas emissions of 62–70% below 2005 levels by 2035, implemented as an emissions budget covering the period 2031–35" (Ref. 222).

8.4.3.2 Climate Change Act 2022

The *Climate Change Act 2022* (Cth) sets out Australia's GHG emissions reduction targets in a manner consistent with the Paris Agreement and Australia's 2030 NDC under that agreement[61] .

Australia's GHG emissions reduction targets are:

- reduce net GHG emissions to 43% below 2005 levels by 2030, which is implemented as a point target and an emissions budget covering the period 2021–2030
- reduce Australia's net GHG emissions to zero by 2050.

Australia's national GHG emissions for FY2025 are estimated to be 437.5 Mt CO_2-e (Ref. 223). Emissions for FY2025 were 28.5% below emissions for FY2005[62] (Ref. 223).

8.4.3.3 NGER and Safeguard Mechanism schemes

The NGER scheme is the Australian Government's national framework for reporting facility information about GHG emissions, energy production, and energy consumption. The scheme is administered through the NGER Act (Cth) and associated regulations.

The Safeguard Mechanism is the Australian Government's scheme that requires relevant industrial facilities to reduce their emissions in line with Australia's GHG emission reduction targets of 43% below 2005 levels by 2030, and net zero by 2050. The Safeguard Mechanism applies to industrial facilities that emit more than

[60] Note: Following revisions to Australia's historical GHG emissions estimates, Australia's implied GHG emissions budget is 4,394 Mt CO_2-e (Ref. 223).

[61] In September 2025 the Australian Government submitted its second NDC; refer to Section 8.4.3.1.

[62] Where FY2005 is the baseline year for Australia's 43% reduction by 2030 target under the Paris Agreement and the *Climate Change Act 2022* (Cth).

100,000 tonnes of carbon dioxide equivalent (CO_2-e) in a year. The Safeguard Mechanism commenced in 2016 and was reformed in 2023. The Safeguard Mechanism is enacted through the NGER Act, as amended by the Safeguard Mechanism (Crediting) Amendment Bill 2023 (Cth); and with additional scheme details as set out in the Safeguard Rule.

Safeguard Mechanism facilities have an annual net GHG emission limit known as a 'baseline'. As part of the 2023 reforms, a decline rate is now applied to a facilities baseline so that it is reduced over time on a trajectory consistent with achieving Australia's emission reduction targets of 43% below 2005 levels by 2030 and net zero by 2050 (Ref. 224). In general, baselines will decline by 4.9% each financial year from FY2024 through to FY2030. The subsequent decline rate will be set in 5-year blocks consistent with updates to Australia's NDC under the Paris Agreement (Ref. 224).

'Gorgon Operations' is a registered facility with the Clean Energy Regulator (CER) under both the NGER and Safeguard Mechanism schemes. The reporting boundary[63] of the Gorgon Operations Facility includes relevant Scope 1[64] GHG emissions from the GTP and associated facilities on Barrow Island, as well as relevant Scope 1 emissions from activities or facilities in Commonwealth waters. The Gorgon Operations Facility has a 'production-adjusted baseline' established under the reformed Safeguard Mechanism. This production-adjusted baseline for FY2025 was 8.54 Mt CO_2-e, inclusive of the decline rate.

All Safeguard facilities' net emissions must be at or below baselines by the annual deadline. Responsible emitters of facilities that exceed or expect to exceed their baselines must manage their excess emissions. Responsible emitters can:

- surrender Australian carbon credit units (ACCUs) or Safeguard Mechanism credit units (SMCs)
- apply for the use of a flexibility measure under the scheme (e.g. borrowing baseline from the following year, or extending the facility's baseline under a multi-year monitoring period).

Each ACCU or SMC represents one tonne of CO_2-e that has been stored or avoided. These credit units are surrendered to the Australian National Registry of Emissions Units, and are then permanently cancelled, thereby removing them from circulation and preventing their reuse.

8.4.4 Primary environmental approval

The *Gorgon Gas Development: Backfill Fields Offshore Project Proposal (*Ref. 3) was accepted by NOPSEMA in October 2025. Section 8.3 of the OPP set out the environmental impact assessment of GHG emissions associated with the Backfill Fields Development. The assessment in the OPP was for the purpose of the whole of the Backfill Fields Development, or which GS3 is just the first stage.

8.4.5 Australian values and sensitivities

The following provides an overview of some of the environmental values and sensitivities within the Australian jurisdiction that may be vulnerable to climate change related effects. It is acknowledged that this is not a comprehensive list as

[63] The reporting boundary (and the relevant activities and associated emissions) are determined in accordance with applicable legislative requirements and regulatory guidance in-force and as amended from time to time.

[64] Note: Scope 2 emissions are also reportable under the NGER scheme. There are currently no Scope 2 emissions associated with the Gorgon Operations Facility.

it is not practical to identify and describe all environmental values and sensitivities in Australia that may be impacted by climate change.

This overview is presented for contextual purposes only. The physical effects of climate change to Australian environmental values and sensitivities cannot reasonably be attributed to a single development's GHG emissions. Anthropogenic GHG emissions from the petroleum activity do not individually cause the physical effects of climate change, rather it is their cumulative effect, in combination with GHG emissions from all other anthropogenic and natural sources since the mid-1700's, that contribute to increased global temperature and global weather trends in the aggregate that may cause or contribute to physical effects on Australian environmental values and sensitivities. It is not reasonably practicable to measure the potential contribution of GHG emissions from the petroleum activity to anthropogenic impacts to climate systems. Furthermore, the petroleum activity's GHG emissions could not be characterised as a *substantial cause* of the physical effects of climate change on environmental values and sensitivities due to their remoteness to the consequence, the inherent uncertainty in the prediction of future environmental risks and impacts, intervening events and impacts, and the fact that the GHG emissions from the petroleum activity constitute a *de minimis* potential reduction to the Intergovernmental Panel on Climate Change's (IPCC's) remaining global carbon budget.

The following overview is distinct to that provided in Section 5, which is focused on the values and sensitivities that may be present within the OA and Hydrocarbon EMBA, and is used to inform the environmental impact and risk assessments for other aspects associated with the petroleum activity.

In the Statement of Reasons for the acceptance of the Gorgon Backfill Fields Development OPP (Ref. 225) NOPSEMA expressly accepted that "the physical effects of climate change on Australian environmental values and sensitivities cannot reasonably be attributed to any single development's greenhouse gas emissions, and that the effects of climate change are cumulative from all emissions source"[65].

8.4.5.1 Matters of national environmental significance

Division 1 of Part 3 of the EPBC Act protects MNES—being a declared World Heritage property, National Heritage place, wetland of international importance (declared Ramsar wetland), listed threatened species or ecological communities, listed migratory species, Commonwealth marine area, Great Barrier Reef Marine Park, nuclear actions, and water resources (as related to unconventional gas or large coal mining developments).

Division 2 of Part 3 of the EPBC Act also protects the environment when actions are taken:

- on Commonwealth land or impact upon Commonwealth land
- that impact Commonwealth Heritage places outside Australian jurisdiction
- by an Australian Government agency.

8.4.5.2 Heritage values

The Convention Concerning the Protection of the World Cultural and Natural Heritage (the World Heritage Convention) is the instrument used to establish a list

[65] Statement of Reasons [44] (Ref. 225).

(the World Heritage List) of properties that have outstanding universal value regarding natural or cultural heritage (Ref. 226). The World Heritage List currently includes 1,248 properties—of which 972 are cultural properties, 235 are natural properties and 41 are properties that meet both cultural and natural criteria (Ref. 227). Twenty-one of these listed properties are within Australia. Australia also has a further eight sites on the Tentative List for possible future World Heritage nomination (Ref. 228).

The National Heritage List comprises places of outstanding natural, historic, and Indigenous heritage values to the Australian nation (Ref. 229). There are currently 126 places on the National Heritage List of which 20 are classed as Indigenous, 70 as historical, and 36 as natural places (Ref. 230). The heritage values of each listed place are described within the Australian Heritage Database (Ref. 230) in relation to each of the National Heritage criteria against with the values of the place were assessed.

8.4.5.3 Wetlands

Wetlands include a variety of habitat types including swamps, marshes, billabongs, lakes, salt marshes, mudflats, mangroves, coral reefs, fens, peat bogs, or bodies of water, and may be natural or artificial, permanent or temporary (Ref. 231). Water within these areas can be static or flowing; fresh, brackish or saline; and can include inland rivers and coastal or marine waters (Ref. 231).

The Convention on Wetlands of International Importance (the Ramsar Convention) encourages the designation of sites containing representative, rare or unique wetlands, or wetlands that are important for conserving biological diversity. Once designated, these sites are added to the List of Wetlands of International Importance and become known as Ramsar sites (Ref. 231). There are currently over 2,500 Ramsar sites around the world; of these Australia currently has 67 Ramsar sites covering a surface area of ~8.4 million ha (Ref. 232; Ref. 233). The ecological character of Australian Ramsar wetlands are described within the reports available on the DCCEEW website (Ref. 234).

8.4.5.4 Listed species and ecological communities

Australia has between ~600,000–700,000 species, of which ~84% of plants, 83% of mammals, and 45% of birds are endemic to Australia (Ref. 235). Ecological communities are unique and naturally occurring groups of fauna and flora; these communities can be determined by factors such as soil type, position in the landscape, climate and water availability (Ref. 235).

The EPBC Act protects Australia's native species and ecological communities by providing for the identification and listing of species and ecological communities as threatened, and the development of management plans (e.g. conservation advices, recovery plans, threat abatement plans, etc.) for these listed species and ecological communities.

Australia currently has:

- 694 listed threatened fauna species (67 extinct, one extinct in the wild, 147 critically endangered, 250 endangered, 222 vulnerable, and seven conservation dependent) (Ref. 236)
- 1,514 listed threatened flora species (35 extinct, 306 critically endangered, 610 endangered, and 563 vulnerable) (Ref. 237)

- 111 listed threatened ecological communities (49 critically endangered, 60 endangered, and two vulnerable) (Ref. 238).

Migratory species listed under international agreements to which Australia is a party are protected under the EPBC Act. These international agreements include bilaterial migration bird agreements (e.g. Japan-Australia Migratory Bird Agreement, China-Australia Migratory Bird Agreement, Republic of Korea-Australia Migratory Bird Agreement), Bonn Convention, Ramsar Convention and the Agreement on the Conservation of Albatrosses and Petrels. Australia currently has 154 listed migratory species (Ref. 239).

Descriptions of threatened or migratory fauna and flora, and threatened ecological communities, including listing advice and management plans (where applicable), are available in the Species Profile and Threats Database (Ref. 240).

8.4.5.5 Commonwealth marine areas

Commonwealth marine areas are defined within section 24 of the EPBC Act. In general, these include the waters, seabed and airspace over waters between the EEZ and coastal waters. Australia has one of the largest marine jurisdictions in the world, with Australian waters covering ~14.7 million km^2 (including the waters around external territories) of which ~7.4 million km^2 are Commonwealth waters surrounding Australia (Ref. 26).

Marine bioregional plans (made under section 176 of the EPBC Act) have been developed for the South-west, North-west, North, and Temperate East marine regions (Ref. 26; Ref. 241; Ref. 242; Ref. 243); these plans identify and describe conservation values within each area. Conservation values are defined as:

- KEFs
- species listed under Part 13 of the EPBC Act
- protected places, including marine reserves, heritage places, and underwater cultural heritage.

While no bioregional plan is in place, a bioregional profile has been developed for the south-east marine region and does identify and describe conservation values in the area (Ref. 244).

Australia has currently established 60 AMPs which are located within Commonwealth waters (Ref. 245). These AMPs are managed via a suite of management plans (Ref. 145; Ref. 246; Ref. 247; Ref. 248; Ref. 249; Ref. 250; Ref. 251; Ref. 252), which identify and describe natural, cultural, heritage, and socioeconomic values associated with each of the AMPs.

8.4.5.6 Great barrier reef marine park

The Great Barrier Reef is a network of almost 3,000 coral reefs and a diverse array of non-reef habitats stretching ~2,300 km along the east coast of Queensland (Ref. 253). The Great Barrier Reef Marine Park extends into both Commonwealth waters and State coastal waters, and is protected under the EPBC Act and the *Great Barrier Reef Marine Park Act 1975* (Cth). The park is jointly managed by the Australian and Queensland Government's.

The Great Barrier Reef is listed as both a World Heritage property and National Heritage place for its outstanding natural values. There are Sea Country values for Aboriginal and Torres Strait Island Peoples associated with the area, as well

as ongoing social and socioeconomic values for communities and industries (Ref. 253).

8.4.5.7 Ecosystems and biodiversity

Australia supports a variety of ecosystem types. Ecosystems provide habitat, promote food chains and webs, and control ecological cycles and processes (Ref. 254). Biodiversity (biological diversity) is the variety of all species—it is the different plants, animals and micro-organisms, their genes, and the terrestrial, marine and freshwater ecosystems of which they are a part (Ref. 255; Ref. 256). Biodiversity provides variety of services including ecological, cultural, and socioeconomic.

The Australian Government recognises the importance of biodiversity and is party to the United Nations Convention of Biological Diversity. The Australian Government has developed *Australia's Strategy for Nature 2024–2030* (Ref. 257) to meet the requirements of a national biodiversity strategy and action plan. Under this strategy, Australia has established national biodiversity targets which include to protect and conserve 30% of Australia's landmass and 30% of Australia's marine areas by 2030 (Ref. 256; Ref. 257).

For terrestrial ecosystems, the Interim Biogeographic Regionalisation for Australia framework recognises 89 geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information (Ref. 256; Ref. 258). Types of terrestrial and aquatic ecosystems present in Australia include native vegetation (e.g. alpine, woodlands, grasses, etc.), rivers and streams, wetlands, and groundwater dependent systems (Ref. 256; Ref. 259; Ref. 260). Terrestrial protected areas cover ~24.9% (as of November 2025) of Australia's landmass (Ref. 261).

For marine ecosystems, the IMCRA framework recognises 41 provincial bioregions based on a benthic bioregionalisation (biogeography of fish supplemented with a geophysical classification) (Ref. 37). These provincial bioregions are further broken down into meso-scale regions (based on biological and physical characteristics) and geomorphic units (based on common geomorphic features). Types of marine and coastal ecosystems present in Australia include mangroves, saltmarshes, dune systems, seagrasses, coral reefs, rocky reefs and kelp beds, canyons and seamounts (Ref. 262; Ref. 263). Marine protected areas cover ~52% of Australian waters (Ref. 261).

8.4.6 Environmental impact and risk evaluation

GHG emissions may result in:

- a potential[66] reduction to IPCC's estimated 'remaining carbon budget' to limit global warming to 1.5–2.0°C.

[66] Use of 'potential' reflects that: (a) the impact assessment assumes that GHG emissions are entirely additive to global atmospheric GHG emissions and does not take into account any reduction in global atmospheric GHG emissions (*Doctors for the Environment (Australia) Incorporated v National Offshore Petroleum Safety and Environmental Management Authority (No 2)* [2025] FCA 989, [109]); (b) there is inherent uncertainty in the impact assessment due to lack of causation and remoteness between GHG emissions and environmental impacts in the specific country where the petroleum activity is regulated; and (c) the OPGGS(E)R necessarily accept a level of inherent uncertainty in predicting future environmental risks and impacts (Ibid [108]).

8.4.6.1 Consequence evaluation

8.4.6.1.1 Impact: A potential reduction to IPCC's estimated 'remaining carbon budget' to limit global warming to 1.5–2.0°C

Remaining carbon budgets

GHGs are natural and anthropogenic gaseous constituents of the atmosphere that absorb and emit radiant energy within the thermal infrared range, causing the greenhouse effect. This effect traps heat in the atmosphere. Therefore, an increase in GHG concentrations in the atmosphere increases this greenhouse effect.

The Summary for Policymakers from the Working Group I contribution to the Sixth Assessment Report (WGI AR6) of the IPCC states that "[h]istorical cumulative CO_2 emissions determine to a large degree warming to date, while future emissions cause future additional warming" (Ref. 264). Future emissions are relevant to remaining carbon budgets, which vary based on emissions scenarios, and "indicate[] how much CO_2 could still be emitted while keeping warming below a specific temperature level" (Ref. 264).

The IPCC defines the term "carbon budget" as "refer[ring] to the maximum amount of cumulative net global anthropogenic CO_2 emissions that would result in limiting global warming to a given level with a given probability, taking into account the effect of other anthropogenic climate forcers. This is referred to as the total carbon budget when expressed starting from the pre-industrial period, and as the remaining carbon budget when expressed from a recent specified date. Historical cumulative CO_2 emissions determine to a large degree warming to date, while future emissions cause future additional warming. The remaining carbon budget indicates how much CO_2 could still be emitted while keeping warming below a specific temperature level."[67]

WGI AR6 outlined that the remaining carbon budget for a 50% likelihood to limit global warming to 1.5°C, 1.7°C, and 2°C is 500 Gt CO_2-e, 850 Gt CO_2-e, and 1,350 Gt CO_2-e from the beginning of 2020, respectively[68]. The IPCC's scientific assessment reports are published every 5–7 years; the Seventh Assessment Report (AR7) cycle began in July 2023 and is expected to conclude in late-2029. As such revisions to the remaining carbon budget estimates are not expected from IPCC until the AR7 Working Group reports are ready for release. However, interim remaining carbon budgets have been published annually and the interim Global Carbon Budget 2025 (Ref. 265) indicates the remaining carbon budget for a 50% likelihood to limit global warming to 1.5°C, 1.7°C, and 2°C is 170 Gt CO2-e, 525 Gt CO_2-e and 1,055 Gt CO_2-e from the beginning of 2026. Note: This 2025 remaining carbon budget is not endorsed by the IPCC and may be subject to change.

The estimated petroleum activity GHG emissions (0.13 Mt CO_2-e) represent a potential ~0.00001–0.00003% reduction in the IPCC's remaining carbon budget (estimated to remain at the beginning of 2020), and a potential ~0.00001–0.00007% reduction in the interim remaining carbon budget (estimated to remain at the beginning of 2026).

In the context of Australian GHG emissions commitments, there is both a point target and an emissions budget over the period 2021–2030 (Sections 8.4.3.1 and

[67] IPCC, AR6, WG1, at SPM-48 footnote 43 (Ref. 264).
[68] IPCC, AR6, WG1, at SPM-29 Table SPM.2 (Ref. 264).

8.4.3.2). To FY2025, the estimated remaining carbon budget to reach the 2030 target is 2,178 Mt CO_2-e (Ref. 223). The estimated petroleum activity GHG emissions (0.13 Mt CO_2-e) represent a potential ~0.006% reduction in the Australian carbon budget to meet their 2030 NDC.

GHG emissions and global anthropogenic influence on climate systems

IPCC states in the AR6 Synthesis Report: Summary for Policymakers (Ref. 266) that "[o]bserved increases in well-mixed GHG concentrations since around 1750 are unequivocally caused by GHG emissions from human activities over this period"[69]. The Synthesis Report also recognises the "interdependence of climate, ecosystems and biodiversity, and human societies"[70] and WGI AR6 of the IPCC acknowledges that "[c]limate change is a global phenomenon, but manifests differently in different regions" (Ref. 267).

Anthropogenic changes to the global climate system cannot be directly attributed to any one development or emission source or product, as they are the result of the net accumulation of global GHGs (emissions minus sinks) in the atmosphere since the industrial revolution (i.e. it is atmospheric GHG concentrations in the aggregate that contribute to global temperature or climate trends).

Based on ice core records, historical atmospheric CO_2 concentrations through glacial ice age cycles extending 650,000–800,000 years before present, ranged between ~172–300 ppm (Ref. 266). Further, measurements of air extracted from Antarctic ice cores and firn show that all three major greenhouse gases (CO_2, CH_4 and N_2O) were relatively stable for most of the past 2,000 years, before beginning to rise in the late 18th century; this timing coincided with industrialisation and the expansion of agriculture (Ref. 268). The IPCC AR6 Synthesis Report states that "[i]n 2019, atmospheric CO_2 concentrations reached 410 parts per million (ppm), CH_4 reached 1866 parts per billion (ppb) and nitrous oxide (N_2O) reached 332 ppb"[71] and that "[s]ince 1750, increases in CO_2 (47%) and CH_4 (156%) concentrations far exceed – and increases in N_2O (23%) are similar to – the natural multi-millennial changes between glacial and interglacial periods over at least the past 800,000 years (*very high confidence*)."[71] This is consistent with Australian Bureau of Meteorology (BoM) and CSIRO reporting that shows the estimated increases in globally averaged atmospheric concentrations of the three major GHGs since the industrial revolution began in the mid-1700's are:

- CO_2 concentration in 2023 was ~419 ppm compared to ~277 ppm in 1750 (~51% increase)
- CH_4 concentration in 2023 was ~1,919 ppb compared to ~731 ppb in 1750 (162% increase)
- N_2O concentration in 2023 was ~337 ppb compared to ~273 ppb in 1750 (23% increase) (Ref. 268).

Anthropogenic sources of GHG emissions are also the results of multiple sectors and land-use practices. The IPCC indicates that in 2019, "approximately 79% of global GHG emissions came from the sectors of energy, industry, transport, and buildings together and 22% from agriculture, forestry and other land use"[72].

[69] IPCC AR6, Synthesis Report, SPM-4 (Ref. 266).
[70] IPCC AR6, Synthesis Report, SPM-1 (Ref. 266).
[71] IPCC AR6, Synthesis Report, 42 (Ref. 266).
[72] IPCC AR6, Synthesis Report, SPM-4–5 (Ref. 266).

With respect to the energy sector, the potential accumulation of GHG emissions in the atmosphere is, in turn, influenced by global energy demand and the composition of the global energy mix. Growing populations, rising incomes, and urbanisation are the principal forces behind energy-demand growth, as they typically lead to greater use of transportation, heating, cooling, lighting, and refrigeration (Ref. 269).

Further, the changing regulatory and international initiatives on climate change (e.g. which may result in changing reduction targets and timeframes), projections in energy supply and demand, and changes in other industrial sectors or land-use practices will also influence the total global GHG emissions into the future – making a future prediction of changes to climate systems, inaccurate.

Anthropogenic GHG emissions from the petroleum activity do not individually cause the physical effects of climate change, rather it is their cumulative effect, in combination with GHG emissions from all other anthropogenic and natural sources since the mid-1700's, that contribute to increased global temperature and global weather trends in the aggregate that may cause or contribute to physical effects on Australian environmental values and sensitivities. It is not reasonably practicable to measure the potential contribution of GHG emissions from the petroleum activity to the cumulative anthropogenic impacts to climate systems. Furthermore, the petroleum activity's GHG emissions could not be characterised as a *substantial cause* of the physical effects of climate change on environmental values and sensitivities, because of their remoteness to the consequence, the inherent uncertainty in the prediction of future environmental risks and impacts, intervening events and impacts, and the fact GHG emissions from the petroleum activity constitute a *de minimis* potential reduction in the remaining global carbon budget.

As a contribution to the anthropogenic influence on the global climate system cannot be directly attributed to any one activity, the following sections provides an overview of some of the potential impacts to climate systems and environmental values and sensitivities for contextual purposes only.

Changes to climate systems

WGI AR6 of the IPCC acknowledges "[c]limate change is a global phenomenon, but manifests differently in different regions" (Ref. 267).

According to the IPCC AR6, the physical risks of climate change are varied and widespread. Chevron Corporation acknowledges that the company's operations are subject to disruption from natural or human causes beyond its control, including physical risks from hurricanes, severe storms, floods, heat waves, other forms of severe weather, wildfires, ambient temperature increases, sea level rise, fires, and earthquakes, some of which may be impacted by climate change and any of which could result in suspension of operations or harm to people or the natural environment (Ref. 270).

According to the IPCC, among other things, global changes to the climate system can include the following: increase in global surface temperatures, changes to frequency and intensity of precipitation, sea level rise, retreat of glaciers and arctic sea ice, changes to the intensity and frequency of certain extreme weather events

and droughts (Ref. 264). Specifically, the IPCC projections[73] for the Australia include:

- **droughts**: Additional regional changes in Australasia … include a significant decrease in April to October rainfall in south-west of the State of Western Australia, observed from 1910 to 2019 and attributable to human influence (*high confidence*), which is *very likely* to continue in future. Agricultural and ecological and hydrological droughts have increased over Southern Australia (*medium confidence*), and meteorological droughts have decreased over Northern and Central Australia (*medium confidence*). … Agricultural and ecological droughts are projected to increase in Southern and Eastern Australia (*medium confidence*) for a 2°C GWL."[74]
- **fire weather conditions**: "The number of evident attribution studies on compound events is limited. There is *medium confidence* that weather conditions that promote wildfires have become more probable in southern Europe, northern Eurasia, the USA, and Australia over the last century. In Australia a number of event attribution studies show that there is *medium confidence* of increase in fire weather conditions due to human influence."[75] Fire weather is projected to increase throughout Australia (*high confidence*).[76]
- **precipitation**: "In the future, heavy precipitation and pluvial flooding are *very likely* to increase over northern Australia and central Australia, and they are *likely* to increase elsewhere in Australasia for global warming levels (GWLs) exceeding 2°C and with *medium confidence* for a 2°C GWL."[77]
- **relative sea level rise**: "Relative sea level has increased over the period 1993–2018 at a rate higher than GMSL around Australasia (*high confidence*). Sandy shorelines have retreated around the region, except in southern Australia, where a shoreline progradation rate of 0.1 myr^{-1} has been observed."[78] "Relative sea-level rise is virtually certain to continue in the oceans around Australasia, contributing to increased coastal flooding in low-lying areas (*high confidence*) and shoreline retreat along most sandy coasts (*high confidence*)."[79]
- **snowfall**: "Snowfall is expected to decrease throughout the region at high altitudes in [] Australia (*high confidence*)."[80] "Observations in Australia show that the snow season length has decreased by 5% in the last five decades. Furthermore, the date of peak snowfall in Australia has advanced by 11 days over the last 5 decades."[81]
- **tropical cyclones**: "In Australia, the number of [tropical cyclones] has generally declined since 1982, and the frequency of intense TCs that make landfall in north eastern Australia has declined significantly since the 19th

[73] "The following terms have been used to indicate the assessed likelihood of an outcome or a result: virtually certain 99–100% probability, very likely 90–100%, likely 66–100%, about as likely as not 33–66%, unlikely 0–33%, very unlikely 0–10%, exceptionally unlikely 0–1%. Additional terms (extremely likely 95–100%, more likely than not >50–100%, and extremely unlikely 0–5%) may also be used when appropriate." IPCC AR6, SPM-4.

[74] IPCC AR6, WG1, TS-93.

[75] IPCC AR6, WG1, TS-74.

[76] IPCC AR6, WG1, TS-93.

[77] IPCC AR6, WG1, TS-93.

[78] IPCC AR6, WG1, TS-93.

[79] IPCC AR6, WG1, 12-57.

[80] IPCC AR6, WG1, TS-93.

[81] IPCC AR6, WG1, TS-93-94.

century (*medium confidence*). There is *high confidence* that cyclones making landfall along north eastern and north Australian coastlines will decrease in number and *low confidence* of an increase in their intensities for a 2°C global warming level as well as for the mid-century period with scenarios RCP4.5 and above, with the amplitude of changes increasing from RCP4.5 to RCP8.5. Decreases in frequency are projected for 'east coast lows.'"[82]

The 2024 *State of the Climate* report by BoM and CSIRO (Ref. 268) indicates trends similar to the IPCC projections including:

- "In the south-west of Australia there has been a decrease of around 16% in April to October rainfall since 1970. Across the same region, May to July rainfall has seen the largest reduction, by around 20% since 1970. … In the south-east of Australia, there has been a decrease of around 9% in April to October rainfall since 1994."[83]
- "There has been an increase in rainfall and streamflow across parts of northern Australia since the 1970s."[83]
- "There has been an increase in extreme fire weather, and a longer fire season, across large parts of the country since the 1950s."[83]
- "Sea levels are rising around Australia, including more frequent extreme high levels that increase the risk of inundation and damage to coastal infrastructure and communities."[83]
- "Snow depth, snow cover and number of snow days have decreased in alpine regions since the late 1950s."[83]
- "There has been a decrease in the number of tropical cyclones observed in the Australian region since at least 1982."[83]

The analyses indicated that "Australia's climate has warmed by an average of 1.51±0.23°C since national records began in 1910" and "[s]ea surface temperatures have increased by an average of 1.08°C since 1900" (Ref. 268).

Australian values and sensitivities vulnerable to climate change

The Working Group II contributions to the IPCC's Sixth Assessment Report (WGII AR6) provides a summary of the observed impacts, vulnerability and exposure, and adaptive responses observed to date (Ref. 271). The WGII AR6 report notes that "[c]limate trends and extreme events have combined with exposure and vulnerabilities to cause major impacts for many natural systems, with some experiencing or at risk of irreversible change in Australia (*very high confidence*)"[84] and that "[c]limate trends and extreme events have combined with exposure and vulnerabilities to cause major impacts for some human systems (*high confidence*)"[84]. The WGII AR6 report identifies nine key climate risks for the Australasian region:

- "Loss and degradation of coral reefs and associated biodiversity and ecosystem service values in Australia due to ocean warming and marine heatwaves (*very high confidence*)
- Loss of alpine biodiversity in Australia due to less snow (*high confidence*)

[82] IPCC AR6, WG1, 12-54, 55.

[83] BoM and CSIRO, Key Points, 2 (Ref. 268).

[84] IPCC AR6, WGII, Australasia FS (Ref. 272).

- Transition or collapse of alpine ash, snowgum woodland, pencil pine and northern jarrah forests in southern Australia due to hotter and drier conditions with more fires (*high confidence*)
- Loss of kelp forests in southern Australia and southeast New Zealand due to ocean warming, marine heatwaves and overgrazing by climate-driven range extensions of herbivore fish and urchins (*high confidence*)
- Loss of natural and human systems in low-lying coastal areas due to sea-level rise (*high confidence*)
- Disruption and decline in agricultural production and increased stress in rural communities in south-western, southern and eastern mainland Australia due to hotter and drier conditions (*high confidence*)
- Increase in heat-related mortality and morbidity for people and wildlife in Australia due to heatwaves (*high confidence*)
- Cascading, compounding and aggregate impacts on cities, settlements, infrastructure, supply-chains and services due to wildfires, floods, droughts, heatwaves, storms and sea-level rise (*high confidence*)
- Inability of institutions and governance systems to manage climate risks (*high confidence*)." [84]

A previous (2009) report by Australia's Biodiversity and Climate Change Advisory Group (Ref. 273) indicates that "[b]iodiversity is one of the most vulnerable sectors to climate change". The report also notes that "Australia's biodiversity is not distributed evenly over the continent but is clustered in a small number of hotspots with exceptionally rich biodiversity", and that these "include the Great Barrier Reef, south-west Western Australia, the Australian Alps, the Queensland Wet Tropics and the Kakadu wetlands" (Ref. 273). The report identifies "a few examples of recently observed changes in Australia's biota that are consistent with the emerging climate change 'signal'", as genetic constitution, geographic ranges, life cycles, populations, ecotonal boundaries, ecosystems, and disturbance regimes (Table 1 within Ref. 273). Further, it is noted that "many of the most important impacts of climate change on biodiversity will be the indirect ones at the community and ecosystem levels, together with the interactive effects with existing stressors" (Ref. 273).

Climate change is identified as a pressure within the Australian *2021 State of the Environment*[85] (Ref. 254; Ref. 274). Observed and/or predicted impacts on terrestrial ecosystems and biodiversity include (Ref. 256):

- "Data from the Australian Long Term Ecological Research Network have been used to examine ecosystem responses to changes in climate and disturbance regimes from plots in tropical savanna, alpine systems, temperate heathlands and temperate woodlands. A range of biodiversity responses to climate were recorded, including decreases in some species and increases in others."
- "Alpine ecosystems and biodiversity in Australia are particularly vulnerable to climate change that affects snow depth and the spatial and temporal extent of snow … Long-term monitoring of alpine vegetation in Australia has shown shifts in plant species composition and diversity, changes in the timing of flowering, and declines in endangered fauna such as the mountain pygmy possum."

[85] The EPBC Act legislates a review of the state of the Australian environment every five years.

- "The ranges of the majority of Australia's eucalypt species are predicted to shrink in size over the next 60 years … Approximately 90% of the current areas with concentrations of palaeo-endemism (i.e. places with eucalypt species that were once widespread and are now restricted to small ranges) are predicted to disappear or shift their location, and this is likely to have significant flow-on effects for ecosystem structure and function".

Observed and/or predicted impacts on aquatic ecosystems and biodiversity include (Ref. 256):

- "Aquatic ecosystems and biodiversity are recognised as being among the most vulnerable to climate change. They experience both local changes and the cumulative effects of changes in the surrounding landscape, as well as exposure to a wide range of extreme climatic events such as floods and droughts."
  - e.g. between late-2015 and early-2016 mangroves in the Gulf of Carpentaria "suffered significant mortality. This happened during an underwater heatwave (which was also responsible for bleaching on the Great Barrier Reef) in combination with a severe drought and a temporary drop in sea level due to a strong El Niño event."
- "Aquatic ecosystems in coastal areas are also affected by sea level rise and storm surge associated with intense storms. Along with structural changes and damage, these will bring changes in water salinity that can have long-term effects on wetland flora and fauna"
- "Altered water quality, as well as quantity, will be a major trigger for climate change effects on freshwater biodiversity. For example, the combination of hot conditions, low flows and significant algal blooms during the recent major drought (2018–20) resulted in mass fish kills in the Murray–Darling Basin."
- "Much of Australia has limited water resources, and there is limited scope for freshwater species to move to more favourable conditions as the climate changes. Species losses under future climates are likely to be high, particularly for inland regions of Australia."

Predicted impacts on coastal and marine ecosystems and biodiversity include (Ref. 262; Ref. 263):

- ocean warming "is associated with poleward range shifts as species move towards cooler waters" which can "cause changes in marine communities" and "can also affect the lifecycle and populations of marine species"
- "Marine heatwaves can significantly impact the supply of nutrients to the upper ocean, and change phytoplankton biomass and primary production, which can have both beneficial and detrimental effects on ecosystems."
- "Prolonged, extremely warm waters cause acute widespread ecosystem damage, with species mortality and community structure shifts, and threaten marine biodiversity and ecosystem services. Such events can have persistent impacts, with kelp forests collapsing, coral recovery taking years and important fishery species recovering slowly."
- "Climate change is affecting ocean salinity, with the effects varying across regions. … However, extreme salinity events through flooding are suggested to be a pressure to more Australian marine environments than climate change trends in salinity"

- “Ocean acidification is predicted to lead to shifts in ecosystems and biodiversity, and increase the risk to regional economies that rely on healthy and sustainable marine ecosystems, such as tourism and aquaculture.”
- “One of the most significant impacts of sea level rise on Australia’s coast is erosion and movement of beaches, and permanent inundation of low-lying areas.”
- “Extreme rainfall events can generate local coastal flooding, either directly or via run-off from slopes or river transports. These floodwaters may carry pollution from agriculture such as soils, pesticides and fertilisers, and can cause turbid coastal plumes. This impacts marine and coastal ecosystems such as coral reefs, seagrass and kelp environments, and the species these habitats support” and conversely that “[e]xtreme dry periods can raise coastal salinity levels through evaporation, affecting marine and coastal habitats and species.”
- “Extreme wind and cyclones can generate high to extreme waves, sea level and storm-surge conditions, which can cause coastal erosion and damage to coastal structures within and around coastlines and embayments.”

It was also noted that Australian boundary currents (e.g. East Australian Current, Indonesian Throughflow, and Leeuwin Current) have a major influence on the marine ecosystem. While it is known that El Niño-Southern Oscillation cycles influence these boundary currents, there is a knowledge gap in predicting future state of boundary currents and an ability to assess impacts on the marine ecosystem (Ref. 263).

The National Climate Risk Assessment (delivered by the Australian Climate Service) provides an analysis of the potential risks and impacts from a changing climate. The national assessment focusses on physical climate risks, is domestically focussed (i.e. within Australian jurisdictional borders), and was completed in two stages. The first pass assessment (released in 2024; Ref. 275) identified 56 nationally significant climate risks within seven key systems. The second pass assessment (released in September 2025; Ref. 275) identified an additional seven nationally significant climate risks (i.e. 63 in total for the full National Climate Risk Assessment).

Nationally significant climate risks were identified for the natural environment (where the natural environment system refers to Australia’s ecosystems and biodiversity) (Ref. 275; Ref. 276):

- **risks to aquatic and terrestrial ecosystem condition and function or landscape** function and collapse including species loss and extinction
- **risks to vulnerable environments and interconnected ecosystems**, such as mangroves, reefs and green spaces, that buffer against other disturbances and provide critical ecosystem services
- **risks to natural resources, including water security**, that increase scarcity and may result in competition and potential conflict
- **risks to species**, through loss and extinction that affect ecosystems, ecological and human communities, and intrinsic, cultural and economic values
- **risks to access, use and management of natural places** from fire season and hot days, as well as damage to roads, built infrastructure and coastal developments

- **risks to rural and Aboriginal and Torres Strait Island peoples' livelihoods** and community resilience from long-term climate-related changes and hazards
- **risks to human health, wellbeing and livelihood** from landscape change that results in disruption, migration and increased pressure on resources, especially in rural and remote communities
- **risks to iconic and unique natural places** and associated cultural, social and Aboriginal and Torres Strait Island peoples' values from a loss of natural environments, amenity value and land and marine use.

The Australian Climate Service has rated risks[86] to Australia's key systems, both now and in the future (Ref. 275). The current risk to the natural environment system has been classified as between High and Very High; and the prediction for 2050 is for this risk to be Severe (Ref. 275).

Key findings from the second pass assessment also talk to nature of changing hazards:

- "Australia's climate is changing and will continue to change into the future. The country is likely to experience more intense and extreme climate hazards, and in some cases in areas where people and places haven't experienced these hazards before.
- Climate science indicates that our future extreme weather is likely to differ significantly from the past. Changes in the timing, duration, intensity and spatial patterns of hazards are likely, with many events occurring more frequently, in combination or affecting new locations.
- The change in distribution, timing and severity of extreme weather events means that historical observations on their own are not likely to be a good indicator of future risk.
- Australia currently experiences compounding and cascading hazards, and this is going to increase. Concurrent events, and reduced time between severe events will become more common" (Ref. 275).

The IUCN World Heritage Outlook for the Ningaloo Coast (Ref. 277) has downgraded the status of the Ningaloo Coast World Heritage Area from "good with some concerns" to "significant concern." The downgrade has been influenced by escalating marine heatwaves and associated coral bleaching. Over the past ~15 years Ningaloo has been exposed to four significant marine heat stress events, and may currently be undergoing its most significant heat stress event to date (Ref. 277). Coral bleaching has been observed along the length of reef system; however, the full extent and severity of this current event are not yet known (Ref. 277).

The 'loss of climatic habitat caused by anthropogenic emissions of greenhouse gases' has been listed as a key threatening process under the EPBC Act (Ref. 278; Ref. 279). The threatening process consists of reductions in the bioclimatic range within which a given species or ecological community exists due to emissions induced by human activities of GHGs (Ref. 279). The process is considered to have a continental distribution, including both terrestrial and marine areas. Ecosystems in which the process occurs include: alpine habitats, coral

[86] The risk ratings categorise impacts into five levels (Low, Moderate, High, Very High and Severe) based on specific criteria. These ratings consider the percentage of the population affected, the extent of geographical impact, and the severity of consequences for vulnerable communities, public health, natural systems and national security (Ref. 275).

reefs, wetlands and coastal ecosystems, polar communities, tropical forests, temperate forests, and arid and semi-arid environments (Ref. 279). Further, DCCEEW have identified climate change as a threat to threatened species, specifically that "[t]he changing climate is affecting Australia's biodiversity currently and will continue to threaten our species and ecological communities. Individual species may see altered distribution, phenology and behaviour, in turn resulting in changes to the composition and function of ecosystems and ecological communities. Climatic shifts can exacerbate the impacts of existing pressures, such as habitat fragmentation and invasive species, on threatened species and places" (Ref. 280). Actions identified within this *Threatened Species Action Plan* include updating conservation plans to mitigate climate change risk for susceptible species (Ref. 280). Of the 20 priority places identified within the *Threatened Species Action* (including the Australian Alps, Eastern Forests of Far North Queensland, and Giant Kelp Ecological Community) all identified climate change as either a major or moderate threat (Ref. 280; Ref. 281).

Climate change has been identified as a threat to some protected species, including marine turtles, whales, seabird and shorebirds:

- The *Conservation Management Plan for the Blue Whale* states: [c]limate change is expected to cause changes in migratory timing and destinations, population range, breeding schedule, reproductive success and survival of baleen whales, including blue whale species and subspecies" (Ref. 52).
- The *Recovery Plan for Marine Turtles in Australia* states that "[c]limate change is of particular concern to marine turtles because it is likely to have impacts across their entire range and at all life stages. Climate change is expected to cause changes in dispersal patterns, food webs, species range, primary sex ratios, habitat availability, reproductive success and survivorship" (Ref. 291).
- The *Wildlife Conservation Plan for Seabirds* (Ref. 80) states that "[c]onsequences to seabirds could include negative impacts from an increase in extreme weather events, reduced or changed prey abundance and distribution, and decrease in nesting habitat".
- The *Wildlife Conservation Plan for Migratory Shorebirds* (Ref. 303) states that '[s]uch changes have the potential to affect migratory shorebirds and their habitats by reducing the extent of coastal and inland wetlands or through a poleward shift in the range of many species".

The management plans for the Australian Marine Parks identify climate change as a pressure that may impact marine park values (Ref. 145; Ref. 246; Ref. 247; Ref. 248; Ref. 249; Ref. 250; Ref. 251; Ref. 252). The *North-west Marine Parks Network Management Plan 2018* (Ref. 145) states that "[t]he impacts of climate change on the marine environment are complex and may include changes in sea temperature, sea level, ocean acidification, sea currents, increased storm frequency and intensity, species range extensions or local extinctions, all of which have the potential to impact on marine park values".

Within the Marine Bioregional Plan for the NWMR (Ref. 26), pressures related to climate change are assessed as 'of potential concern' for species of marine turtle, inshore dolphins, sawfish, sea snakes, whale shark, dugong, and seabird and shorebird, as well as the KEFs and shipwrecks known to occur in the NWMR. Similarly within the other marine bioregional plans, pressures related to climate change were assessed as 'of concern' or 'of potential concern' to values within each bioregion (Ref. 241; Ref. 242; Ref. 243).

Evaluation summary

In summary, given that:

- atmospheric GHG concentrations are the aggregate consequence of GHG emissions from all sectors and land-uses, and have been increasing since the mid-1700s
- climate change is a global and cumulative phenomenon, it is not reasonably practicable to measure any one development's contribution to anthropogenic impacts to climate systems
- Australia has GHG emission reduction targets that align with intent of the Paris Agreement
- Gorgon Operations, which includes emissions from activities within Commonwealth waters, is a registered facility under the Commonwealth NGER and Safeguard Mechanism schemes

the potential impact of the contribution of **petroleum activity GHG emissions** to the potential reduction of IPCC's estimated remaining carbon budget for a 50% likelihood to limit global warming to 1.5–2.0°C has been evaluated as having the potential to result in an **Incidental (6)** consequence.

8.4.6.2 Control measures

Table 8-13 describes the good practice control measures relevant to this aspect.

Table 8-13: Good practice control measures relevant to planned emissions—GHG

Control measure	Description
CM-13: NGER and Safeguard Mechanism	As described in Section 8.4.3.3, Gorgon Operations is registered with the CER as a facility under both the NGER and Safeguard Mechanism schemes. The Gorgon Operations Facility is managed via a production-adjusted baseline. All Safeguard Mechanism facilities' net emissions must be at or below baselines by the annual deadline. Responsible emitters of facilities that exceed or expect to exceed their baselines must manage their excess emissions (e.g. by surrendering offset credits). CAPL will comply with all NGER and Safeguard Mechanism requirements for the Gorgon Operations facility.
CM-12: Marine Order 97	Marine Order 97— Marine pollution prevention—air pollution (2022) sets out requirements for the prevention of air pollution by vessels. Prior to commencement of the petroleum activity, Chevron's OVIS requirements within the *Chevron Shipping's Marine Standard Non Tankers: Corporate OE Standard* (Ref. 180) are used to verify that vessels comply with relevant Marine Order 97—Marine pollution prevention— air pollution (2022) requirements, including: • relevant vessels (as defined in regulation 6 of MARPOL 73/78 Annex VI) will hold a valid IAPP certificate and/or IEE certificate • marine diesel engines with >13 kW power output installed on a vessel will comply with nitrous oxides (NOx) emission levels as per regulation 13 of MARPOL 73/78 Annex VI • marine diesel engines >130 kW power output on relevant Australian vessels will have an Engine International Air Pollution Prevention (EIAPP) certificate as per Division 7 of Marine Order 97 (2022) • relevant vessels (as defined in Chapter 4 of MARPOL 73/78 Annex VI) will have: – an EEDI or EEXI and comply with relevant reduction factors – a SEEMP

Control measure	Description
	– a CII and comply with relevant reduction factors. • sulphur content of fuel is within prescribed limits.
CM-14: Fuel consumption	MODU and vessel fuel usage will be recorded during the petroleum activity.

8.4.6.3 ALARP justification

Offshore production drilling operations are common both nationally and internationally. GHG emissions occurring within Australia are managed under Australian regulatory mechanisms. The Gorgon Gas Development is subject to requirements established under the Commonwealth NGER and Safeguard Mechanism schemes, and these regulatory requirements are incorporated into the good practice control measures below.

During relevant persons consultation, no objections or claims were raised regarding GHG arising from the petroleum activity.

Given the petroleum activity GHG emissions constitute a minor potential reduction to IPCC's estimated remaining carbon budget for a 50% likelihood to limit global warming to 1.5–2.0°C, and based on the environmental impact evaluation and application of relevant assessment tools as commensurate with the predicted level of impact (e.g. lower-order impacts), CAPL considers the adopted good practice control measures (Section 8.4.6.2) are appropriate to manage the potential impacts from GHG emissions. No reasonably practicable additional control measures were identified that would provide a meaningful reduction in environmental impact. Accordingly, CAPL considers the potential environmental impacts associated with this aspect to be reduced to ALARP.

8.4.7 Demonstration of acceptability

Table 8-14 describes the demonstration of acceptability relevant to this aspect.

Table 8-14: Demonstration of acceptability relevant to planned emissions—GHG

Comparison with acceptable level
Acceptable level AL-08 is applicable to GHG emissions associated for the petroleum activity (refer to Section 6.7). The petroleum activity GHG emissions has been estimated at ~0.13 Mt CO_2-e. This represents a *de minimis* potential reduction to IPCC's remaining carbon budget for a 50% likelihood to limit global warming to 1.5–2.0°C. The Gorgon Operations facility must comply with legislative requirements under the Commonwealth NGER and Safeguard Mechanism schemes, and therefore petroleum activity GHG emissions will be managed to be equivalent or better than the acceptable level.
Principles of ESD
CAPL refers to the recent Federal Court decision for *Doctors for the Environment (Australia) Incorporated v National Offshore Petroleum Safety and Environmental Management Authority (No 2)* [2025] FCA 989 that found: • the OPGGS(E)R do not require a level of certainty, prescription or exactness in cases where that is not possible or reasonable. The inherent uncertainties in the relationship between the activity, climate change trends and predicted consequential environmental impacts do not prevent NOPSEMA from being satisfied an EP meets acceptance criteria [157] • the OPGGS(E)R do not require that acceptable levels or an EPO be quantified or be a metric, they may be qualitative in nature especially where a risk or impact is uncertain [158]. The impact identified for GHG emissions was the potential reduction to IPCC's remaining carbon budget for a 50% likelihood to limit global warming to 1.5–2.0°C. The consequence associated with this aspect was evaluated as Incidental (6).

Precautionary Principle

In accordance with Table 6-2, a consequence level of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. Notwithstanding, CAPL acknowledges the residual uncertainty associated with evaluation of environmental impacts from GHG emissions, and presents the following consideration of the Precautionary Principle in relation to this aspect.

Uncertainty arises from limitations in climate science (including climate modelling), revised projections for domestic and global energy trends, and changes in regulatory and policy requirements. These areas are expected to evolve, and new information to become available over time. CAPL have adopted control measures to address residual uncertainty.

Gorgon Operations is a registered facility under the Commonwealth NGER and Safeguard Mechanism schemes, and as such is not inconsistent with Australia's national efforts to reach net zero by 2050 (as per targets within *Climate Change Act 2022* (Cth)).

Intergenerational Principle

GHG emissions associated with the petroleum activity constitute a *de minimis* potential reduction to IPCC's estimated remaining global carbon budget for a 50% likelihood to limit global warming to 1.5–2.0°C, and through complying with Commonwealth NGER and Safeguard Mechanism schemes, the risks of adverse impacts to the health, diversity, or productivity of the environment is expected to be negligible. The principle of inter-generational equity is considered to be met for the petroleum activity.

Biodiversity Principle

Anthropogenic GHG emissions from the petroleum activity do not individually cause the physical effects of climate change, rather it is their cumulative effect, in combination with GHG emissions from all other anthropogenic and natural sources since the mid-1700's, that contribute to increased global temperature and global weather trends in the aggregate that may cause or contribute to physical effects on Australian environmental values and sensitivities, including biological diversity and ecological integrity.

It is not reasonably practicable to measure the contribution of GHG emissions from the petroleum activity to the cumulative anthropogenic impacts to climate systems and they could not be characterised as a *substantial cause* of the physical effects of climate change on environmental values and sensitivities, because of their remoteness to the consequence, intervening impacts and the fact GHG emissions from the petroleum activity constitute a relatively minor reduction in IPCC's remaining global carbon budgets for a 50% likelihood to limit global warming to 1.5–2.0°C.

Relevant environmental legislation and other requirements

Legislation and other requirements considered relevant for this aspect include:

- *National Greenhouse and Energy Reporting Act 2007* (Cth)
- National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Cth)
- Marine Order 97 (2022)
- *Conservation Management Plan for the Blue Whale 2015–2025 (*Ref. 52)
- *Conservation Advice Balaenoptera physalus fin whale* (Ref. 282)
- *Conservation Advice Balaenoptera borealis sei whale* (Ref. 283)
- *Conservation Advice for Sousa sahulensis Australian humpback dolphin* (Ref. 284)
- *Conservation Advice for Orcaella heinsohni Australian snubfin dolphin* (Ref. 285)
- *National Recovery Plan for the Southern Right Whale (Eubalaena australis) (*Ref. 111*)*
- *Recovery Plan for Marine Turtles in Australia* (Ref. 291)
- *Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake)* (Ref. 450)
- *Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake)* (Ref. 451)
- *Conservation advice for the whale shark* (Ref. 292)
- *Sawfish and River Sharks Multispecies Recovery Plan (*Ref. 409*)*
- *Conservation Advice on Pristis clavate (Dwarf Sawfish)* (Ref. 486)
- *Recovery Plan for the Grey Nurse Shark (Carcharias taurus)* (Ref. 487)
- *Recovery Plan for the White Shark (Carcharodon carcharias) (*Ref. 488)
- *Conservation Advice for largetooth sawfish Pristis pristis* (Ref. 490)
- *Wildlife Conservation Plan for Seabirds* (Ref. 80)
- *Wildlife Conservation Plan for Migratory Shorebirds* (Ref. 303)

- *National Recovery Plan for albatrosses and petrels* (Ref. 304)
- *Conservation Advice for Abbott's Booby Papasula abbotti* (Ref. 491)
- *Conservation Advice for Limnodromus semipalmatus (Asian dowitcher)* (Ref. 492)
- *National Recovery Plan for the Australian Painted Snipe Rostratula australis (*Ref. 493)
- *National Recovery Plan for (Sternula nereis nereis) (Australian Fairy Tern)* (Ref. 496)
- *Conservation Advice for Australian painted snipe Rostratula australis* (Ref. 494)
- *Conservation Advice for Tringa nebularia (Common Greenshank)* (Ref. 497)
- Conservation Advice for Calidris ferruginea (Curlew Sandpiper) (Ref. 498)
- *Conservation Advice for Numenius madagascariensis (Far Eastern Curlew)* (Ref. 499)
- *Conservation Advice for golden bosun (Phaethon lepturus fulvus)* (Ref. 500)
- *Conservation Advice for Charadrius leschenaultia (Greater Sand Plover)* (Ref. 501)
- *Conservation Advice for Limosa lapponica menzbieri (Yakutian bartailed Godwit)* (Ref. 503)
- *Conservation Advice for little tern Sternula albifrons* (Ref. 502)
- *Conservation Advice for Calidris canutus (Red Knot)* (Ref. 504)
- *Conservation Advice for Calidris acuminata (Sharp-tailed Sandpiper)* (Ref. 506)
- *Conservation Advice for red-tailed tropicbird (Indian Ocean) Phaethon rubricauda westralis* (Ref. 505)
- *North-west Marine Parks Network Management Plan* (Ref. 145)
- *Marine bioregional plan for the North-west Marine Region* (Ref. 26).

CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:

Requirement	Demonstration
NGER Act and Safeguard Mechanism Gorgon Operations is registered with the CER as a facility under both the NGER and Safeguard Mechanism schemes. As such, there is annual emissions reporting requirements for the facility.	The requirements relating to GHG emissions reporting have been incorporated into the **NGER and Safeguard Mechanism** control measure.
Marine Order 97 2022 Gives effect to Annex VI of MARPOL 73/78	IAPP and IEE certificate (as per Division 3), nitrogen oxides emission requirements (as per Division 7), and energy efficiency requirements (as per Division 9) have been incorporated into the **Marine Order 97** control measure.
Conservation Management Plan for the Blue Whale 2015–2025 Action A.3.1: Continue to meet Australia's international commitments to reduce GHG emissions and regulate the krill fishery in Antarctica	As described in the above impact evaluation, the estimated additional GHG emissions associated with the petroleum activity are considered de minimis (~0.13 Mt CO_2-e) and are not considered to be inconsistent with Australia meeting its international agreements (i.e. NDCs under the Paris Agreement).
Conservation Advice Balaenoptera physalus fin whale Conservation action: Continue to meet Australia's international commitments to reduce greenhouse gas emissions and regulate the krill fishery in Antarctica.	As described in the above impact evaluation, the estimated additional GHG emissions associated with the petroleum activity are considered de minimis (~0.13 Mt CO_2-e) and are not considered to be inconsistent with Australia meeting its international agreements (i.e. NDCs under the Paris Agreement).
Conservation Advice Balaenoptera borealis sei whale Conservation action: Continue to meet Australia's international commitments to reduce greenhouse gas emissions and regulate the krill fishery in Antarctica.	As described in the above impact evaluation, the estimated additional GHG emissions associated with the petroleum activity are considered de minimis (~0.13 Mt CO_2-e) and are not considered to be inconsistent with Australia meeting its international agreements (i.e. NDCs under the Paris Agreement).
Conservation Advice for Sousa sahulensis Australian humpback dolphin	N/A

No specific conservation action identified	
Conservation Advice for Orcaella heinsohni Australian snubfin dolphin No specific conservation action identified	N/A
National Recovery Plan for the Southern Right Whale (Eubalaena australis) Action A3.1: Continue to meet Australia's international commitments to address causes of climate change, including greenhouse gas emissions	As described in the above impact evaluation, the estimated additional GHG emissions associated with the petroleum activity are considered de minimis (~0.13 Mt CO_2-e) and are not considered to be inconsistent with Australia meeting its international agreements (i.e. NDCs under the Paris Agreement).
Recovery Plan for Marine Turtles in Australia Action A2.1: Continue to meet Australia's international commitments to address the causes of climate change	As described in the above impact evaluation, the estimated additional GHG emissions associated with the petroleum activity are considered de minimis (~0.13 Mt CO_2-e) and are not considered to be inconsistent with Australia meeting its international agreements (i.e. NDCs under the Paris Agreement).
Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake) No specific conservation action identified	N/A
Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake) No specific conservation action identified	N/A
Conservation advice for the whale shark No specific conservation action identified	N/A
Sawfish and River Sharks Multispecies Recovery Plan Action 5c*:* Identify risks to important sawfish and river shark habitat and measures needed to reduce those risks.	Section 8.4.6 provides an impact assessment from GHG associated to the petroleum activity and consideration of control measures has been identified. Therefore, this activity is not considered to be inconsistent with the *Sawfish and River Sharks Multispecies Recovery Plan*
Conservation Advice on Pristis clavate (Dwarf Sawfish) No specific conservation action identified	N/A
Recovery Plan for the Grey Nurse Shark (Carcharias taurus) No specific management action identified	N/A
Conservation Advice for largetooth sawfish *Pristis pristis* No specific conservation action identified	N/A
Recovery Plan for the White Shark (Carcharodon carcharias) No specific management action identified	N/A
Wildlife Conservation Plan for Seabirds *Action 2d:* Ensure all areas of important habitat for seabirds are considered appropriately and consistently in the development assessment process	Section 8.4.6 provides an impact and risk assessment from GHG emissions associated with the petroleum activity and consideration of control measures has been identified. Therefore, this activity is not considered to be inconsistent with the *Wildlife Conservation Plan for Seabirds*
Wildlife Conservation Plan for Migratory Shorebirds Action 3f: Ensure all areas important to migratory shorebirds in Australia continue	Section 8.4.6 provides an impact and risk assessment from GHG emissions associated with the petroleum activity and consideration of control measures has been identified. Therefore, this activity

to be considered in development assessment processes	is not considered to be inconsistent with the *Wildlife Conservation Plan for Migratory Shorebirds*
National Recovery Plan for the Australian Painted Snipe Rostratula australis No specific management action identified	N/A
Conservation Advice for Australian painted snipe Rostratula australis No specific conservation action identified	N/A
National Recovery Plan for albatrosses and petrels No specific management action identified	N/A
Conservation Advice for Abbott's Booby *Papasula abbotti* No specific conservation action identified	N/A
Conservation Advice for Limnodromus semipalmatus (Asian dowitcher) No specific conservation action identified	N/A
National Recovery Plan for (Sternula nereis nereis) (Australian Fairy Tern) No specific management action identified	N/A
Conservation Advice for Tringa nebularia (Common Greenshank) No specific conservation action identified	N/A
Conservation Advice for Calidris ferruginea (Curlew Sandpiper) No specific conservation action identified	N/A
Conservation Advice for Numenius madagascariensis (Far Eastern Curlew) No specific conservation action identified	N/A
Conservation Advice for golden bosun (*Phaethon lepturus fulvus)* No specific conservation action identified	N/A
Conservation Advice for Charadrius leschenaultia (Greater Sand Plover) No specific conservation action identified	N/A
Conservation Advice for little tern Sternula albifrons No specific conservation action identified	N/A
Conservation Advice for Limosa lapponica menzbieri (Yakutian bartailed Godwit) No specific conservation action identified	N/A
Conservation Advice for Calidris canutus (Red Knot) No specific conservation action identified	N/A
Conservation Advice for red-tailed tropicbird (Indian Ocean) *Phaethon rubricauda westralis* No specific conservation action identified	N/A

Conservation Advice for Calidris acuminata (Sharp-tailed Sandpiper) No specific conservation action identified	N/A
North-west Marine Parks Network Management Plan No specific conservation action identified	N/A
Internal context	
These management processes or procedures were deemed relevant for this aspect: • Chevron Shipping's *Marine Standard Non Tankers: Corporate OE Standard* (Ref. 180) Control measures related to the above management process or procedures have been identified for this aspect. As such, CAPL considers that the environmental impact and risk management is consistent with company policy, culture, and standards.	
External context	
During relevant persons consultation for this EP, no objections or claims were raised regarding GHG emissions arising from the petroleum activity.	

8.4.8 Environmental performance

Table 8-15 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-15: Environmental performance relevant to planned emissions—GHG

EPO	Control meausre	EPS	MC
EPO-11: GHG emissions are managed in accordance with requirements under the Commonwealth NGER and Safeguard Mechanism Schemes.	**CM-13**: NGER and Safeguard Mechanism	**EPS-13:** CAPL will implement GHG emissions management, reductions, and reporting aligned with requirements under the Commonwealth Safeguard Mechanism, to the extent such requirements remain in-force and as amended from time to time.	**MC-13:** Records confirm GHG emissions management, reductions, and reporting are aligned with applicable requirements under the Commonwealth Safeguard Mechanism.
	CM-12: Marine Order 97	**EPS-12:** Prior to commencement of vessel-based activities within the OA, the following will be verified: • relevant vessels (as appropriate to class) will hold a valid IAPP and/or IEE certificate • relevant marine diesel engines on vessels will comply with NOx emission levels and/or have an EIAPP certificate • relevant vessels (as appropriate to	**MC-12:** OVIS report, ABU Marine OE Inspection Checklist, or equivalent record confirms vessels hold appropriate certificates and/or plans, marine diesel engines comply with NOx emission levels, and sulphur content of fuel is within prescribed limits.

EPO	Control meausre	EPS	MC
		class) will have a SEEMP, EEDI/EEXI, and/or CII • sulphur content of fuel is within prescribed limits.	
	CM-14: Fuel consumption	**EPS-14:** MODU and vessels fuel usage will be recorded during the petroleum activity.	**MC-14:** Records confirm MODU and vessel fuel usage during the petroleum activity.

8.5 Planned emissions—Artificial light

8.5.1 Source of aspect

Activities identified as having the potential to generate artificial light emissions are:

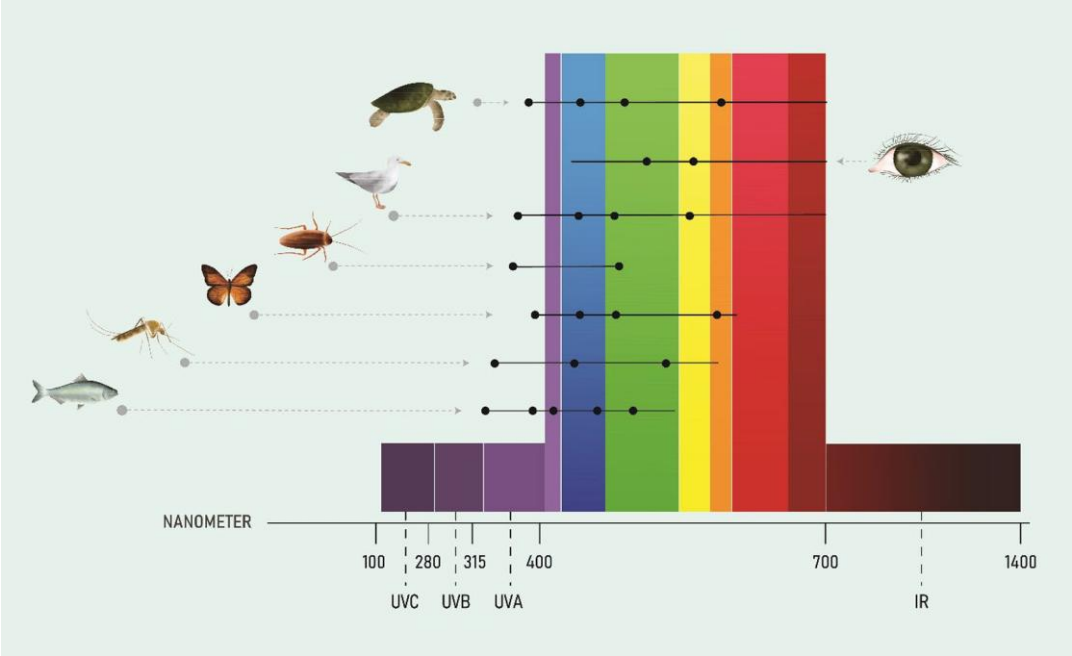
- navigational and operational lighting from MODU and vessels
- flaring during contingency well intervention activities.

8.5.2 Artificial light modelling

Light is a form of energy that is emitted over a particular band of frequencies and wavelengths of the electromagnetic spectrum. Fauna perceive light differently to humans. Depending on the species, the visible spectrum for fauna can vary between the ultraviolet and infrared spectra (i.e. wavelengths between ~300 and >700 nanometres) (Ref. 17). For fauna, being sensitive to light within a specific range of wavelengths means that they can perceive light at that wavelength, and it is likely they will respond to that light source (Ref. 17).

Factors affecting how wildlife perceive light include the type of cells used to detect light (photopic versus scotopic vision); whether the light is viewed directly from the source or as reflected light; how the light interacts with the environment; and the distance from the light source (Ref. 17).

Figure 8-1 shows the sensitivity of different species to different wavelengths, with most species sensitive to short wavelength light (i.e. in the ultraviolet [UV], violet, blue spectra).



(Source: Ref. 17) Ability to perceive different wavelengths of light in humans and wildlife is shown by horizontal lines. Black dots represent reported peak sensitivities

Figure 8-1: Ability to perceive light and peak sensitivities to light for humans and wildlife

8.5.2.1 MODU and vessels

Artificial light emissions are generated by navigation and operational lighting on the MODU and vessels. The MODU, and up to two vessels, may be present at any time within the OA during the G&E drilling campaign for ~12–18 months (Sections 4.1.2, 4.4.1 and 4.4.2). IMR is not a planned activity under this EP, but has been carried as a contingency; a vessel may be within the OA for ~7 days for subsea inspections and a MODU/intervention vessel and vessels may be within the OA for ~50 days during well intervention (Sections 4.1.2 and 4.4.2).

Nocterra undertook artificial light modelling to inform the impact and risk assessment associated with artificial light emissions associated from the petroleum activity (Ref. 294).

The Nocterra modelling software integrates with the publicly available ILLUMINA model originally developed by Aubè et at. (Ref. 295) to predict the visibility and intensity of a particular light source at specific viewpoints. The ILLUMINA model is designed to simulate the effect of various atmospheric factors on night-time light emissions from a precise inventory of lighting fixtures (Ref. 295 cited in Ref. 294). Lighting inventories were developed by Nocterra for the MODU and PSVs and input into the model. Model outputs can be split into direct, reflected, and scattered (glow) light components; for completeness all three were considered together in this modelling Ref. 294).

The methodology used for this artificial light modelling (Ref. 294) is consistent with the *National Light Pollution Guidelines* (Ref. 17).

Scenarios

Two scenarios were modelled—the MODU by itself, and the MODU with the two PSVs (Table 8-16). These two scenarios are considered appropriate to cover all

activities under this EP; an individual vessel undertaking IMR was not modelled as the light emissions would occur within a smaller spatial area.

Table 8-16: Artificial light modelling scenarios

Scenario	Details
A	MODU under drilling operations.
B	MODU under drilling operations with two PSVs located 500 m either side.

Exposure criteria

In the absence of any published or generally accepted effect criteria for measuring the impact of artificial light on marine fauna, moonlight was selected as a proxy. Modelling results were converted from the native unit of measurement (radiance) into orientation field-of-view full moon equivalents (OFOV FME) (Table 8-17; Ref. 294).

Table 8-17: OFOV FME categories and descriptions

OFOV FME	Description	Potential relevance to marine fauna
<0.01	Brightness visible within 180° x 30° field-of-view is less than 1% of a full moon.	Light or light glow is considered ambient and no impact expected. Equivalent to the light output from a new moon.
0.01–0.1	Brightness visible within 180° x 30° field-of-view is between 1 % and 10 % of a full moon.	Light or light glow visible but behavioural impact unlikely (i.e. not biologically relevant). Equivalent to the light output from the first quarter moon to new moon.
0.1–1.0	Brightness visible within 180° x 30° field-of-view is between 10 % and 100 % of a full moon.	Light or light glow visible and behavioural impact possible, depending on ambient moon phase at the time of exposure, which will influence the visibility of the artificial light sources, equivalent to the light output. Artificial lights will be more visible under a first quarter moon than under a full moon.
>1.0	Brightness visible within 180° x 30° field-of-view is greater than 100 % of a full moon.	Light or light glow visible and impact likely. Represents a bright light, equivalent to greater than one full moon. This light radiance will override the moderating influence of the ambient full moon at the time of exposure.

Modelling results

Table 8-18 details the distances at which specific OFOV FME values were predicted to be reached. The results indicate that at distances >18.59 km from the MODU, or >19.60 km from the MODU if both PSVs are also present, that the radiance has reduced to ambient conditions. However, it is at distances of up to ~8.32–8.76 km from the MODU that the artificial light emissions from the MODU and vessels may be at biologically relevant levels. Therefore, this distance (~8.76 km) has been used to define the predicted artificial light exposure area from the MODU and vessels for use in the impact and risk assessment.

The artificial light emissions from the MODU and vessels do not intersect with land (offshore islands or mainland) and are restricted to offshore regions (Ref. 294).

Table 8-18: OFOV FME contour modelling results

OFOV FME	Distance from source to Impact Category (km)	
	Scenario A	Scenario B
<0.01	>18.59	>19.60
0.1	8.32	8.76
1.0	2.99	3.26
>1.0	<2.99	<3.26

8.5.2.2 Flaring

Well intervention is not a planned activity under this EP, but has been carried as a contingency. Flaring may occur during well intervention (Section 4.3.2.1). For the G&E drilling campaign, flaring infrastructure is not intended to be installed on the MODU (Section 4.2.11.4).

Modelling

Given that a single well intervention event (i.e. single flaring event) is being carried as a contingency activity under this EP, a line-of-sight analysis was selected for the purpose of informing the risk assessment. The analysis is based on the method described by Young (Ref. 293):

$$d_l = \sqrt{2\mathrm{Rh}}$$

Where:

d_l = total line of sight

R = radius of earth (~6,371 km)

h = height of object

Based on previous MODUs or intervention vessels used by CAPL, a flare height of ~16 m above operating sea level has been used (i.e. h = 0.016 km). This gives an estimated total line of sight (d_l) distance as ~14.3 km. This distance represents the point at which the visibility of the flare drops below the horizon, and has been conservatively used to define the predicted artificial light exposure area from flaring for the risk assessment.

It is noted that the visibility of artificial light does not necessarily imply a measurable change in ambient light and therefore a potential impact; as such, the use of a line-of-sight estimate for flaring is considered a conservative estimate of the radius of the area of effect.

Note: Flaring would occur concurrently with operational and navigation light use from the MODU (or intervention vessel) and vessels. However, given that the conservative line-of-sight spatial exposure distance adopted for artificial light emissions from flaring fully encompasses the predicted biologically relevant artificial light exposure area associated with operational and navigation lighting from the MODU and vessels (Section 8.5.2.1), the use of the ~14.3 km is considered appropriate to reflect the light emissions from all sources (i.e. operational/navigation lighting and flaring) for the purposes of the impact and risk assessment.

8.5.3 Concurrent petroleum activities

Section 5.4.6 identifies other petroleum activities that may occur within the vicinity (≤20 km) of the OA during the indicative schedule for the G&E drilling campaign.

No fixed sources light emissions (e.g. platforms or the J-IC FCS) are within 20 km of the OA. Other CAPL or third-party petroleum activities that may result in artificial light emissions include:

- vessel-based IMR activities occurring along the Jansz trunkline (CAPL)
- vessel-based IMR activities occurring on Julimar subsea production system structures (CAPL)
- vessel-based activities during installation of the Jansz umbilical (CAPL)
- vessel-based activities during G&E pipelay, subsea infrastructure installation and pre-commissioning (CAPL)
- vessel-based activities during Backfill Fields site investigation surveys at C&D (CAPL)
- vessel-based IMR activities along the Scarborough trunkline (Woodside)
- MODU and vessel-based activities during Julimar-Brunello P&A (Woodside)
- vessel-based activities during the proposed Pluto 4D MSS (Woodside).

Most of these activities are spatially separate (~20 m to ~18.5 km) from the OA. As such, if the activities were to occur at the same time as the G&E drilling campaign, they are generally not close enough to result in overlapping light emissions, except potentially for the proposed Pluto seismic survey and G&E pipelay, subsea infrastructure installation and pre-commissioning activities. The Pluto OA is only ~20 m from the G&E OA; however, the active source and acquisition areas (i.e. where most vessel-based activity will occur) are >11 km from the G&E OA. The G&E pipelay, subsea infrastructure installation and pre-commissioning activities are part of the GS3 project. The wells covered under this EP will be tied into the proposed infrastructure; therefore, both OAs spatially overlap. Based on current deterministic and probabilistic schedules, the maximum potential overlap between the petroleum activities is estimated to be up to ~2 months. Consequently, concurrent artificial light emissions may occur.

Modelling of artificial light emissions from a multi vessel scenario, which includes a MODU with two vessels in addition to five vessels (i.e. a pipelay, construction, supply and two pipe supply vessels), predicted that biologically relevant light levels may extend up to ~11.58 km from the source (Ref. 528). The conservative exposure distance assumed for artificial light emissions associated with contingency flaring activities (~14.2 km; Section 8.5.2.2), fully encompasses the extent of artificial light predicted for the concurrent activities. Therefore, the risk assessment for flaring is considered conservative and no further assessment of this concurrent activity has been undertaken.

Light intensity is inversely proportional to distance, any additive effect of overlapping light emissions substantially reduces the greater the distance between the vessels. Any additional artificial light emissions within the broader NWS area from other petroleum activities would be intermittent and temporary (e.g. weeks to months depending on the campaign).

Given the spatial separation of artificial light sources from other CAPL or other operator petroleum activities to G&E, these are considered a minor contribution to

the ambient light conditions around G&E and as such are not considered further within this impact and risk assessment.

8.5.4 Environmental impact and risk evaluation

Artificial light emission may result in a:

- localised and temporary change in ambient light.

A localised and temporary change in ambient light may result in a:

- potential change in behaviour of marine fauna.

8.5.4.1 Consequence evaluation

8.5.4.1.1 Impact: Localised and temporary change in ambient light

Artificial light emissions from MODU and vessel operations are temporary sources of light. The estimated duration of the G&E drilling campaign is 12–18 months, and contingency IMR activities are ~7 days for vessel-based inspections or ~50 days for single well intervention. As activities under this EP can be undertaken 24 hours a day, lighting is required at night for navigation and to ensure safe operations on the MODU/vessels. Light emissions associated with flaring during contingency well intervention activities may also occur.

As identified in Section 8.5.2, artificial light exposure areas are estimated to be radial distances of ~8.8 km from the MODU during drilling (or well intervention) activities, and ~14.3 km from the MODU during flaring. Light would return to ambient levels following the cessation of the petroleum activity.

Given the temporary nature of the artificial light (i.e. no permanent above-surface facilities are within scope of this EP), the distance from the OA to the nearest land (~75 km to Montebello Island), and the predicted artificial light exposure distances, CAPL has assessed the localised and temporary change in ambient light as Incidental (6).

8.5.4.1.2 Risk: Potential change in behaviour of marine fauna

As identified in Section 8.5.2, artificial light exposure areas are estimated to be radial distances of ~8.8 km from the MODU during drilling (or well intervention) activities, and ~14.3 km from the MODU during flaring. Light-sensitive fauna (including birds, reptiles and fish) are the species most at risk from this aspect.

The *National Light Pollution Guidelines* (Ref. 17) indicate a precautionary buffer of 20 km around nesting habitats; however, given the distance from the OA to the nearest land (~75 km to Montebello Island) and the estimated radial exposure areas of artificial light, the precautionary buffer has not been applied during the following risk assessment.

Seabirds and shorebirds

As identified in Section 5.3.3, several marine species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. The wedge-tailed shearwater breeding BIA is the only BIA identified within the artificial light exposure area.

Activities that result in a change in ambient light conditions, may lead to potential changes in the behaviour of seabirds and shorebirds such as disruption to foraging, breeding or migration behaviours. Studies conducted between 1992 and

2002 in the North Sea confirmed that artificial light was the reason that birds were attracted to and accumulated around illuminated offshore infrastructure (Ref. 300).

Anthropogenic disturbance (including artificial lighting) is identified as a threat within the *Wildlife Conservation Plan for Migratory Shorebirds* (Ref. 303), the *National Recovery Plan for albatrosses and petrels* (Ref. 304), and light pollution is identified as a threat within the *Wildlife Conservation Plan for Seabirds* (Ref. 80). Fledglings are considered more vulnerable due to underdeveloped eye ganglions, disturbance to sea-finding cues, and potential connection between light and food (Ref. 80).

At its closest, the OA is located ~75 km from the nearest coast (Montebello Island), with no emergent land suitable for roosting or nesting identified within the OA. Given that artificial light exposure area is expected to extend ~8.8 km from the MODU during drilling (or well intervention) activities, and ~14.3 km from the MODU during flaring, exposure of nesting adult birds or fledglings to artificial light emissions from the activity will not occur at breeding colonies, and therefore have not been evaluated further.

It is possible that nocturnally active seabirds and/or migratory shorebirds may be affected by light-spill and make alterations to their normal behaviours. It is suggested that procellariforms (shearwaters, petrels and albatross) species that forage at night are instinctively attracted to light because they exploit bioluminescent prey (Ref. 301; Ref. 305). This attraction may be stronger outside of bright moonlit nights, when artificial light temporarily enhances foraging conditions (Ref. 306).

In all seabirds, their photopic vision (light-adapted) is most sensitive in the long wavelength range (590–740 nm, orange to red) while their scotopic (dark-adapted) vision is more sensitive to short wavelengths (380–485 nm, violet to blue) (Ref. 17). Peak spectral emissions from MODU and flares artificial lights are not expected to occur within these lower and more sensitive wavelength bands of blue, violet and UV light (i.e. not within the sensitive ranges for scotopic vision). However, the intensity of light may be a more important cue than colour for seabirds; very bright light will attract them, regardless of colour (Ref. 17).

As previously mentioned, a breeding BIA for wedge-tailed shearwater overlaps the artificial light exposure area. These BIAs are buffers around islands that the species is known to nest on as they forage in surrounding waters during nesting seasons. Their presence in the Pilbara is seasonal, typically occurring between August to April/May (Section 5.3.3.4.1). The departure and arrival typically occurs in April/May and August, respectively (Ref. 85; Ref. 86), with breeding colonies on islands off Barrow Island (Double and Boodie islands), and the Lowendal and Montebello Islands.

Shearwaters typically forage relatively close to breeding islands or over a large area, depending on prey availability (Ref. 84). Given the offshore location of the petroleum activity, any potential changes in behaviour due to artificial light are expected to be limited to transient individuals during nocturnal foraging.

Birds are also known to use ships as stopovers during migration, especially when they encounter unfavourable conditions, such as wind, rain or fog (Ref. 307, Ref. 308). These stopovers may alter their migratory routes (Ref. 309) increasing energy costs to migratory travel. While the mechanism of light attraction is not fully proven, it is hypothesised that artificial lighting may interfere with the internal magnetic compass of migratory shorebirds and nocturnal seabirds (Ref. 310). Marquenie (Ref. 300) estimated that a change in migratory behaviour of birds was

limited to <5 km from the source. Therefore, potential changes in behaviour due to artificial light are expected to be spatially restricted affecting only individual seabirds crossing the OA during their migratory season.

Because light emissions have the potential to cause localised, short-term impact to transient migratory seabirds or nocturnal foraging individuals, and given the temporary nature of artificial light exposure (i.e. no permanent above-surface facilities), the consequence associated with potential changes in behaviour due to artificial light has been assessed as Minor (5).

Marine reptiles

As identified in Section 5.3.3.2, several marine reptile species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. No BIAs or HCTS of marine turtles were identified within the predicted artificial light exposure areas.

Artificial light emissions have the potential to change behaviour of marine turtles, such as inhibiting nesting by adult females and disrupting the orientation and sea finding behaviour of hatchlings (Ref. 17; Ref. 291).

The *Recovery Plan for Marine Turtles in Australia* (Ref. 291) identifies light pollution as a key threat because it can disrupt critical behaviours, such as nesting, hatchling orientation, sea finding, and hatchling dispersal behaviour. Light pollution is classified as “of less concern” to turtles during offshore-based activities in open waters (Ref. 446).

According to the *Recovery Plan* (Ref. 291), nesting HCTS of each species is defined at a stock level. The closest nesting HCTS of a species to the OA include Barrow, Montebello, and Lowendal islands, which have been identified as nesting habitat for flatbacks, greens, and/or hawksbill turtles (Ref. 291). Upon entering to the water, hatchlings primarily use wave direction to orient toward deeper waters (Ref. 291). In the absence of wave cues, swimming hatchlings may orient towards light (Ref. 312, Ref. 313) and in some cases, light cues may override or interfere with wave cues or other dispersal cues over short distances in nearshore waters (Ref. 313; Ref. 314).

The OA is located ~75 km from the nearest coast (Montebello Island). Given that artificial light exposure areas are estimated to extend ~8.8 km from the MODU during drilling (or well intervention) activities, and ~14.3 km from the MODU during flaring light spill onto coastal or nearshore areas will not occur. Therefore, adult nesting turtles and hatchlings will not be exposed to artificial light emissions from the petroleum activity at nesting locations and have not been evaluated further.

The *Recovery Plan for Marine Turtles in Australia* (Ref. 291) also defines internesting HCTS of a species as a distance seaward from nesting HCTS of a species of 60 km for flatbacks and 20 km for green and hawksbill turtles. Studies (Ref. 315; Ref. 316) have indicated that internesting behaviour of flatback turtles on the NWS appears more spatially restricted than that suggested by the *Recovery Plan* (Ref. 291). Whittock et al. (Ref. 315) reported that flatback turtles prefer habitats within proximity of the coast and at relatively shallow depths during their internesting periods. Unsuitable flatback turtle internesting habitat was defined as waters >25 m deep and >27 km from the coast (Ref. 315). Green and hawksbill turtles have also demonstrated spatially restricted behaviour during internesting, and have been recorded as staying with within 5 km of Barrow Island and within shallow coastal waters (Ref. 317). No BIAs or HCTS for marine turtles overlap with the predicted artificial light exposure areas. No light spill into internesting HCTS or preferred internesting habitat is predicted; therefore,

internesting adult turtles are not expected to be exposed to artificial light emissions from the petroleum activity and have not been evaluated further.

Consequently, based on observed behaviours, habitat preferences and the offshore location of the petroleum activity, only adult transient marine turtles may be expected to occur within the predicted artificial light exposure areas. As such, the consequence associated with this risk has been evaluated as Incidental (6).

Fishes, including sharks and rays

Artificial light may result in varied ecological changes to fish, including changes to predatory behaviour and abundance (Ref. 318, Ref. 319), altering hatching success (Ref. 320), acting as an attractant for plankton (Ref. 321), or altering circadian behavioural rhythms (Ref. 319).

As identified in Section 5.3.3.3, several fish (including sharks and ray) species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. No BIAs or HCTS for fishes and sharks overlap with the predicted artificial light exposure areas. In addition, light has not been identified as a threat within the Recovery Plans for the grey nurse shark (Ref. 487), white shark (Ref. 488), sawfish and river sharks (Ref. 409) or the Conservation advices for the whale shark (Ref. 292), green sawfish (Ref. 489), largetooth sawfish (Ref. 490) and dwarf sawfish (Ref. 486).

Observations during fish assemblage surveys were predominantly of pelagic fishes (Ref. 33); these types of species are generally considered mobile and/or transient in nature (Ref. 78). Demersal fishes were also observed throughout soft sediment habitats (Ref. 33), however are also generally mobile taxa without any site attachment (Ref. 78). As such, only transient species are expected to occur within the predicted artificial light exposure areas.

Given the transient nature of the fishes, including sharks and rays, the temporary nature of artificial light exposure (i.e. no permanent above-surface facilities) and no known aggregation areas identified, CAPL has ranked the potential change in behaviour of fishes, including sharks and rays as Incidental (6).

8.5.4.2 Control measures

Table 8-19 describes the good practice control measures relevant to this aspect.

Table 8-19: Good practice control measures for planned emissions—artificial light

Control measure	Description
CM-15: Light management for night operations	The petroleum activity is indicatively scheduled to commence from early-2027, with the drilling campaign estimated to take ~12–18 months to complete. The petroleum activity may overlap with the bird breeding, foraging or migratory periods and the nest season for marine turtles. As a conservative management measure, MODU and vessels working at night will be required to reduce external lighting to the minimum required for safe operations (and where practicable have this lighting directed downwards). The MODU and vessels will also make use of window coverings (e.g. blinds) during night operations to shield internal lights from view. The OA is located ~75 km from the nearest coast (Montebello Island) and as such, no measurable change in light from the vessels will occur at coastal or nearshore locations. Table 5, Table 8, and Table 11 within the *National Light Pollution Guidelines for Wildlife* (Ref. 17) provides a toolbox of light management options for marine turtles, seabirds and migratory shorebirds respectively, that may be relevant for consideration depending on the activity. This control measure is consistent with the following light

Control measure	Description
	management options as identified within the *National Light Pollution Guidelines for Wildlife* (Ref. 17) for seabirds and migratory shorebirds: • aim lights downwards • reduce unnecessary outdoor deck lighting at sea by restricting external lighting to the minimum required for safe operations and navigation, and using window blinds to shield internal lights.
CM-16: Seabird management procedure	CAPL's *Seabird Management Procedure* (Ref. 322) will be implemented for MODU and vessel-based petroleum activities. The procedure includes: • an overview of key species • management procedures for any seabird interaction. Implementation of a seabird management procedure is aligned with a proposed management option (Table 8) from the *National Light Pollution Guidelines for Wildlife* (Ref. 17).

Table 8-20: Additional control measures evaluated for planned emissions—artificial light

Control measure	Benefit	Cost
External Vessel Lighting	Table 5, Table 8, and Table 11 of the *National Light Pollution Guidelines for Wildlife* (Ref. 17) provide a toolbox of light mitigation options for marine turtles, seabirds, and migratory shorebirds respectively. Some of the additional mitigation options within these toolboxes include consideration of the use of lighting that is: • flashing or intermittent instead of fixed beam • uses motion sensors to turn on lights only when needed • uses luminaires with a particular spectral signature and/or intensity or • avoids high intensity light of any colour. Replacing existing external lighting on vessels with lighting that uses some or all of the above mitigations may further reduce the potential risks of artificial light on marine fauna. As identified in Section 8.5.2, artificial light exposure areas are estimated to be radial distances of ~8.8 km from the MODU during drilling (or well intervention) activities, and ~14.3 km from the MODU during flaring. Further, the OA is located ~75 km from the nearest coast (Montebello Island), with no emergent land suitable for roosting or nesting identified within the OA. As such, all artificial light emissions from the MODU and vessels will occur in	The cost of retrofitting external lighting of the vessels is considered grossly disproportionate to the limited environmental benefit (and no change in residual risk) it may provide for marine fauna in an offshore open ocean environment. Therefore, this control measure has not been adopted for use.

Control measure	Benefit	Cost
	open ocean away from offshore islands or mainland coasts; i.e. the light emissions occur away from any potential internesting, nesting or breeding sites for seabirds, shorebirds, or marine turtles. The implementation of any or all of these external lighting controls are considered to be of limited environmental benefit, and would not result in a reduction of residual risk.	

8.5.4.3 ALARP justification

Offshore drilling and vessel operations are commonplace and well-practised nationally and internationally. The potential impacts and risks associated with artificial light emissions from these types of activities are managed through control measures aligned with applicable guidelines and recognised as standard industry practice. These requirements are well understood and implemented by the petroleum industry, including by CAPL.

During relevant persons consultation, no objections or claims were raised regarding light emissions arising from the petroleum activity.

Artificial light modelling has been used to inform the spatial extent of biologically relevant light, and this is considered an appropriate basis to inform environmental impact and risk assessments.

Based on the environmental impact and risk evaluation and application of relevant assessment tools as commensurate with the predicted level of impact and risk (e.g. higher-order impacts and risks), CAPL considers the adopted good practice control measures (Section 8.5.4.2) are appropriate to manage the potential impacts and risks from artificial light emissions. No further reasonably practicable control measures were identified that would provide a meaningful reduction in environmental impact or risk without incurring grossly disproportionate costs. Accordingly, CAPL considers the potential environmental impacts and risks associated with this aspect to be reduced to ALARP.

8.5.4.4 Likelihood and risk level summary

Due to the nature and scale of the petroleum activity within scope of this EP, the deep offshore location of the OA, the overlap between predicted artificial light exposure areas with BIAs for some fauna (wedge-tailed shearwater), the mobile and transitory nature of marine fauna within the vicinity of the OA, and the application of the above control measure, CAPL has assessed the likelihood and residual risk as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential change in behaviour of marine fauna:			
Seabirds and shorebirds	Minor (5)	Remote (5)	Very Low (9)
Marine reptiles	Incidental (6)	Rare (6)	Very Low (10)
Fishes, including sharks and rays	Incidental (6)	Rare (6)	Very Low (10)

8.5.5 Demonstration of acceptability

Table 8-21 describes the demonstration of acceptability relevant to this aspect.

Table 8-21: Demonstration of acceptability relevant to planned emissions—artificial light

Comparison with acceptable level	
Acceptable levels AL-12, AL-13, AL-14 and AL-15 are applicable to artificial light emissions associated with the petroleum activity (refer to Section 6.7). As described in the impact and risk evaluation (Section 8.5.4.1), changes to ambient light are predicted to be temporary and spatially limited. The subsequent potential changes to marine fauna behaviour were predicted to be localised and short-term disturbance to a small number of individuals. The predicted impacts would not decrease the availability or quality of important habitat, result in impacts at population level that would prevent long-term recovery or survival or have lasting effects on ecosystem integrity. As such, the predicted level of impact will be managed to be equivalent or better than the acceptable levels AL-12, AL-13, AL-14 and AL-15.	
Principles of ESD	
Precautionary Principle In accordance with Table 6-2, a consequence level between Minor (5) and Incidental (6) do not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level between Minor (5) and Incidental (6) do not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required. *Biodiversity Principle* The impacts and risks associated with this aspect include localised and short-term behavioural responses of transient species, which is not expected to result in effects at a population level that would prevent their long-term recovery or survival. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity.	
Relevant environmental legislation and other requirements	
Legislation and other requirements considered relevant for this aspect include: • *National Light Pollution Guidelines for Wildlife* (Ref. 17) • *Wildlife Conservation Plan for Seabirds* (Ref. 80) • *National Recovery Plan for albatrosses and petrels* (Ref. 304) • *Recovery Plan for Marine Turtles in Australia* (Ref. 291) • *Conservation Advice for whale shark* (Ref. 292) CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:	
Requirement	**Demonstration**
National Light Pollution Guidelines for Wildlife Recommends: • best-practice lighting design to reduce light pollution and minimise the effect on wildlife • undertaking an environmental impact assessment for effects of artificial light on listed species for which artificial light has been demonstrated to affect behaviour, survivorship, or reproduction.	Section 8.5.4 provides an impact and risk assessment for artificial light emissions from the petroleum activity (including where concurrent activities may result in cumulative effects) and consideration of control measures as identified within the mitigation toolboxes for marine turtles, seabirds, and migratory shorebirds.
Wildlife Conservation Plan for Seabirds *Action 2d*: Ensure all areas of important habitat for seabirds are considered appropriately and consistently in the development assessment process.	Exposure areas from artificial light emissions from the petroleum activity (including any potential cumulative effects from concurrent activities), and any associated impacts or risks, have been described in the above consequence evaluation.

Wildlife Conservation Plan for Migratory Shorebirds Action 3f: Ensure all areas important to migratory shorebirds in Australia continue to be considered in development assessment processes.	The control measures identified above are considered appropriate to manage risks to seabirds and migratory shorebirds to ALARP. Given that potential impacts from artificial light emissions are predicted to be localised and short-term, affecting only transient migratory seabirds or nocturnal foraging individuals, that changes to ambient light exposure are not expected to occur at breeding colonies, and that appropriate control measures are in place, the activity is not considered inconsistent with the *Wildlife Conservation Plan for Seabirds* and *Wildlife Conservation Plan for Migratory Shorebirds.*
National Recovery Plan for albatrosses and petrels No specific management action identified.	N/A.
Recovery Plan for Marine Turtles in Australia Management action A8.1: Artificial light within or adjacent to HCTS of marine turtles will be managed such that marine turtles are not displaced from these habitats (as per section 3.3 Table 6 of Ref. 291). Note: This is also a specific action identified for the G-NWS individual stock. Management action A8.3: Identify the cumulative impact on turtles from multiple sources of onshore and offshore light pollution. In addition to the above actions, the following specific actions have been identified for individual turtle stocks: • flatback turtle Pilbara (F-Pil): Manage artificial light from onshore and offshore sources to ensure biologically important behaviours of nesting adults and emerging / dispersing hatchlings can continue • hawksbill turtle WA (H-WA): Manage artificial light from onshore and offshore sources to ensure biologically important behaviours of nesting adults and dispersing hatchlings can continue.	Exposure areas from artificial light emissions from the petroleum activity (including any potential cumulative effects from concurrent activities), and any associated impacts or risks, have been described in the above consequence evaluation. Given the unsuitability of the OA as internesting habitat, no marine turtle BIAs or HCTS overlap the predicted artificial light exposure areas, and no light spill into internesting or nesting habitat is expected, potential impacts at internesting or nesting locations are not predicted. As such, the activity is not considered to be inconsistent with the *Recovery Plan for Marine Turtles in Australia.*
Conservation Advice for whale shark Conservation action: Assess the impacts of offshore installations and associated environmental changes (light spill, chronic noise, changed water temperature, localised nutrient levels) on whale sharks and mitigation options for these impacts.	Section 8.5.4 provides a risk assessment and consideration of control measures for MODU and vessel light spill. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for whale shark.*
Internal context	
These management processes were deemed relevant for this aspect: • *Seabird Management Procedure* (Ref. 322).	

Control measures related to the above management procedure have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.
External context
During relevant persons consultation, no objections or claims were raised regarding light emissions arising from the petroleum activity.

8.5.6 Environmental performance

Table 8-22 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-22: Environmental performance for planned emissions—artificial light

EPO	Control measure	EPS	MC
EPO-13: Artificial light emissions from planned petroleum activities do not prevent light sensitive marine fauna[87] from undertaking biological important behaviours[88].	**CM-15:** Light management for night operations	**EPS-15:** MODU and vessels working at night will be required to: • reduce external lighting to the minimum required for safe operations and navigation • where practicable, operational lighting directed downwards to the working deck area to avoid light spill to water • use window coverings to shield internal lights from view (unless windows are required to be uncovered for safe operations).	**MC-15:** Inspection records confirm that during night operations only the minimum lighting for safe operations and navigation is used, and where practicable, operational lighting is directed downwards to working deck area, and internal window coverings are used (unless required for safe operations).
	CM-16: Seabird management procedure	**EPS-16:** CAPL's Seabird Management Procedure will be implemented to manage interactions with seabirds and MODU/vessels.	**MC-16:** Records confirm the seabird management procedure was implemented as required.

[87] Where light sensitive marine fauna includes marine turtles, seabirds and migratory shorebirds.

[88] Where biologically important behaviours are defined as behaviour associated with critical life functions (e.g. reproduction, foraging, migration, and resting) (Ref. 323).

8.6 Planned emissions—Underwater sound (non-impulsive)

8.6.1 Source of aspect

Activities identified as having the potential to generate non-impulsive[89] underwater sound emissions are:

- drilling operations
- MODU and vessel operations (e.g. from propeller cavitation, thrusters, etc.), ROV/AUV operations (e.g. from propulsion system), and helicopter operations
- acoustic survey equipment (SSS and MBES) during contingency IMR activities.

8.6.2 Underwater sound modelling

8.6.2.1 Drilling, MODU, and vessel operations

JASCO Applied Sciences (JASCO) undertook acoustic and animat modelling studies (Ref. 327; Ref. 328) to inform the impact and risk assessment associated with non-impulsive underwater sound emissions from the petroleum activity.

Scenarios

Five scenarios were modelled— four related to drilling operations (including associated MODU and vessel sound sources), and one for contingency IMR activities (Table 8-23).

Underwater sound that radiates from vessels is produced mainly by propeller and thruster cavitation, with a smaller proportion produced by sound transmitted through the hull, such as by engines, gearing, and other mechanical systems (Ref. 327). 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 (Ref. 327).

Table 8-23: Description of modelled scenarios and sound source levels

Scenario	Description	Model water depth	Broadband source levels[90]
1	Drillship under DP and drilling	1,285 m	Drillship: 188.0 dB re 1 µPa^{2}s
2	Drillship under DP and drilling, with a resupply PSV alongside for 8 hours	1,285 m	Drillship: 188.0 dB re 1 µPa^{2}s PSVs: 176.7 dB re 1 µPa^{2}s
3	Drillship under DP and drilling, with two PSVs on standby ~500 m away	1,282–1,287 m	
4	Drillship under DP and drilling, MSV under DP ~500 m away, and one PSV on standby	1,284–1,286 m	Drillship: 188.0 dB re 1 µPa^{2}s MSV: 182.8 dB re 1 µPa^{2}s PSV: 176.7 dB re 1 µPa^{2}s
5	IMR vessel under DP	1,285 m	IMR vessel: 182.5 dB re 1 µPa^{2}s

[89] Non-impulsive sounds can be broadband, narrowband or tonal, brief or prolonged, continuous or intermittent, and typically do not have a high peak sound pressure with rapid rise or decay times (Ref. 329; Ref. 330).

[90] Broadband source levels for the drillship are given over a 10 Hz to 31 kHz range; the PSVs and IMR vessel are given over a 10 Hz to 25 kHz range (Ref. 327).

Effect criteria

Different species groups perceive and respond to sound differently, and so different effect criteria have been established. The modelling studies used the following effect criteria (Table 8-24) which were based on the most applicable science available at the time of the modelling:

- frequency-weighted accumulated sound exposure level[91] (SEL_{24h}) from the United States (US) National Marine Fisheries Service (NMFS) (Ref. 329) for the onset of auditory injury (AINJ)[92] and temporary threshold shift (TTS)[93] in cetaceans
- frequency-weighted SEL_{24h} from the US Navy (Ref. 331) for the onset of AINJ and TTS in marine turtles
- un-weighted sound pressure level (SPL)[94] from the US National Oceanic and Atmospheric Administration (NOAA) criterion for marine mammal behavioural disruption (Ref. 330)
- sound exposure guidelines for fish, fish eggs and fish larvae, and marine turtles from shipping and continuous sounds in Popper et al. (Ref. 332)[95].

Note: For the purpose of interpreting and applying Action Area A.2 of the Conservation Management Plan for the Blue Whale (Ref. 52), published guidance from the Australian Government has defined 'injury to blue whales' as "both permanent and temporary hearing impairment [PTS and TTS] and any other form of physical harm arising from anthropogenic sources of underwater noise" (Ref. 333).

Acoustic modelling results

Where several modelled scenarios are representative of a single activity type (e.g. drilling), such as where type and number of vessels have been varied in the scenarios, the furthest distance from the source that fauna may be exposed to sound levels above the effect criteria has been selected for evaluation of potential risks.

Distances relevant to the sound source can be presented in two formats:

- R_{max}—this is the maximum range to the given effect criteria sound level
- $R_{95\%}$—this is the range to given effect criteria sound level after the 5% of farthest points were excluded.

In cases where a sound level contour is irregular in shape (e.g. small protrusions or anomalous fringes) or there is separated contours (e.g. isolated smaller

[91] Where sound exposure level (SEL) is the level of the sound exposure in a stated frequency band and time window (Ref. 327). Within the acoustic modelling studies, the duration period for SEL accumulation is defined as a 24-hour period (SEL_{24h}) (Ref. 327).

[92] A-INJ refers to damage to the inner ear that can result in destruction of tissue, such as the loss of cochlear neuron synapses or auditory neuropathy (Ref. 329). A-INJ may or may not result in permanent threshold shift (PTS). PTS is a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range about a previously established reference level (Ref. 329).

[93] TTS is a temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (Ref. 329). TTS may or may not reduce fitness (Ref. 333).

[94] Where SPL is the time-mean-square sound pressure in a stated frequency band and time window; typically expressed in terms of root-mean-square (rms) (Ref. 327).

[95] Only quantitative effect criteria were modelled; qualitative effect criteria were applied directly in the risk assessment.

ensonified area/s separate to the main area) use of the R_{max} parameter may not be the most appropriate representation of a distance to inform impact and risk evaluation.

Table 8-25 summarises the maximum horizontal distances to the quantitative non-impulsive sound effect criteria for marine mammals, turtles, and fishes with swim bladders involved in hearing.

Note: The SEL_{24h} is a cumulative metric that reflects the dosimetric impact of sound levels integrated over 24 hours. The predicted radius for SEL_{24h} effect criteria does not mean that an animal travelling within this radius of the source will be impacted, but rather that an animal could be experience auditory impairment or injury if the total accumulated sound energy it receives within the ensonified area exceeds the relevant TTS or AINJ criteria within a 24-hour period.

Animat modelling for pygmy blue whales

In addition to the acoustic propagation modelling, JASCO also undertook animal movement modelling (animat modelling) for pygmy blue whales (Ref. 327). Sound exposure distribution estimates are determined by moving large numbers of simulated animals (animats) through a modelled time-evolving sound field, computed using specialised sound source and sound propagation models.

The JASCO Animal Simulation Model Including Noise Exposure (JASMINE) was used to predict the exposure of northward migrating pygmy blue whales to sound from the petroleum activity. JASMINE integrates the predicted sound field with biologically meaningful movement rules that results in an exposure history for each animat in the model (Ref. 327). The parameters used for forecasting realistic behaviours (e.g. diving and foraging depth, swim speed, surface times) are determined and interpreted from marine mammal studies (e.g. tagging studies) where available, or reasonably extrapolated from related or comparable species (Ref. 327). To generate statistically reliable probability density functions, model simulations by JASCO were run with animat sampling densities of 4 animats/km^2 (Ref. 327). This sampling density is not related to real-world density estimates for pygmy blue whales which are likely to be much lower (e.g. see Thums et al. [Ref. 60]). For cumulative metrics, an individual animat's SELs are summed over a 24 hour duration to determine its total received energy and then compared to the relevant effect criteria. For single-exposure metrics, the maximum exposure is evaluated against effect criteria for each 24-hour period.

The modelled 95th percentile exposure ranges ($ER_{95\%}$) to the relevant effect criteria for low frequency cetaceans are shown in Table 8-26. Within the $ER_{95\%}$, there is generally some proportion of animats that do not exceed the effect criteria. This occurs for several reasons, including the spatial and temporal characteristics of the sound field and the way in which the animats sample the sound field over time, both vertically and horizontally (Ref. 327). The probability (P_{exp}) that an animat within the $ER_{95\%}$ was exposed above effect criteria was also computed and is shown in Table 8-26. Further, to facilitate comparison the R_{max} and $R_{95\%}$ predicted from acoustic propagation modelling for the same scenarios is also shown in Table 8-26.

Under animat modelling, the effect criteria for AINJ onset was not reached for drilling or IMR model scenarios, and the effect criteria for TTS onset was also not reached for the IMR scenario. The predicted $ER_{95\%}$ from animat modelling for TTS onset were substantially reduced for drilling operations compared to predicted $R_{max}/R_{95\%}$ from acoustic propagation modelling (Table 8-26). Similarly, the predicted $ER_{95\%}$ to behavioural effect criteria was substantially reduced compared

to the $R_{max}/R_{95\%}$ from acoustic propagation modelling (Table 8-26). Exposure ranges predicted using animat modelling are considered more realistic than acoustic modelling, due to the incorporation of species-specific behaviour and movements based on available scientific literature (Ref. 327).

Note: The JASMINE model does not incorporate potential avoidance behaviour, in which case the animat moving through the ensonified area would potentially dive to water depths or horizontal planes where it is quieter (i.e. outside of the ensonified area). Accordingly results of the animat modelling are still conservative by design as potential avoidance behaviour would result in less sound accumulation and exposure ranges that are significantly shorter than the acoustic ranges to effect criteria for pygmy blue whales. Furthermore, the scenarios and source levels applied within the modelling do not consider that non-impulsive acoustic sources such as DP thrusters are highly dynamic over time in response to changing metocean conditions; therefore, in most cases actual source levels will be significantly lower than the source levels adopted within the model for the purposes of this risk evaluation.

Table 8-24: Effect criteria for non-impulsive sound for different types of impacts and species groups

Receptor	Mortality[96] and potential mortal injury[97]	Recoverable injury[98,97]	AINJ onset	TTS onset[97]	Masking[99,97]	Behaviour[100,97]
Low frequency cetaceans	N/A	N/A	SEL_{24h}: 197 dB re 1 μPa^2s	SEL_{24h}: 177 dB re 1 μPa^2s	N/A	SPL: 120 dB re 1 µPa
High frequency cetaceans	N/A	N/A	SEL_{24h}: 201 dB re 1 μPa^2s	SEL_{24h}: 181 dB re 1 μPa^2s	N/A	
Very high frequency cetaceans	N/A	N/A	SEL_{24h}: 181 dB re 1 μPa^2s	SEL_{24h}: 161 dB re 1 μPa^2s	N/A	
Marine turtles	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	SEL_{24h}: 198 dB re 1 μPa^2s	SEL_{24h}: 178 dB re 1 μPa^2s	(N) High (I) High (F) Moderate	(N) High (I) Moderate (F) Low
Fish—no swim bladder (particle motion detection)[101]	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	N/A	(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/A	(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 hours	N/A	158 dB SPL for 12 hours	(N) High (I) High (F) High	(N) High (I) Moderate (F) Low

[96] Mortality and mortal injury refers to immediate or delayed death (Ref. 333).

[97] Relative risk (high, moderate, low) is given for fauna at three distances from the source (near [N], intermediate [I] and far [F]). Where 'near' is considered to be in the order of tens of meters from the source, 'intermediate' is hundreds of meters, and 'far' in the thousands of meters (Ref. 333).

[98] Recoverable injury includes injuries unlikely to result in mortality, such as hair cell damage and minor haematoma (Ref. 333).

[99] Masking refers to impairment of hearing sensitivity in the presence of noise (Ref. 333).

[100] For fish and turtles: behavioural effects refer to a substantial change (i.e. does not include small changes such as startle responses) in behaviour (Ref. 333). For cetaceans: behavioural effects can range in severity from no observable response to more substantial changes (Ref. 331).

[101] Also appropriate for sharks (Ref. 327).

Receptor	Mortality[96] and potential mortal injury[97]	Recoverable injury[98,97]	AINJ onset	TTS onset[97]	Masking[99,97]	Behaviour[100,97]
Fish eggs and fish larvae	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	N/A	(N) Low (I) Low (F) Low	(N) High (I) Moderate (F) Low	(N) Moderate (I) Moderate (F) Low

Table 8-25: Predicted horizontal distances (R_{max}, $R_{95\%}$)[102] to non-impulsive effect criteria for marine fauna

Receptor	Recoverable injury		AINJ onset		TTS onset		Behaviour	
	R_{max}	$R_{95\%}$	R_{max}	$R_{95\%}$	R_{max}	$R_{95\%}$	R_{max}	$R_{95\%}$
Drilling (Scenario 1)								
Low frequency cetaceans	N/A		SEL_{24h}: 0.10 km	SEL_{24h}: 0.10 km	SEL_{24h}: 1.01 km	SEL_{24h}: 0.98 km	SPL: 5.70 km	SPL: 5.47 km
High frequency cetaceans	N/A		SEL_{24h}: –	SEL_{24h}: –	SEL_{24h}: 0.19 km	SEL_{24h}: 0.18 km		
Very high frequency cetaceans	N/A		SEL_{24h}: 0.09 km	SEL_{24h}: 0.09 km	SEL_{24h}: 1.77 km	SEL_{24h}: 1.73 km		
Marine turtles	N/A		SEL_{24h}: 0.08 km	SEL_{24h}: 0.08 km	SEL_{24h}: 0.81 km	SEL_{24h}: 0.79 km	N/A	
Fish—swim bladder involved in hearing	SPL for 48 hours: –	SPL for 48 hours: –	N/A		SPL for 12 hours: 0.04 km	SPL for 12 hours: 0.04 km	N/A	
Drilling (Scenario 2)								
Low frequency cetaceans	N/A		SEL_{24h}: 0.11 km	SEL_{24h}: 0.11 km	SEL_{24h}: 1.03 km	SEL_{24h}: 0.99 km	SPL: 5.72 km	SPL: 5.51 km
High frequency cetaceans	N/A		SEL_{24h}: –	SEL_{24h}: –	SEL_{24h}: 0.21 km	SEL_{24h}: 0.19 km		
Very high frequency cetaceans	N/A		SEL_{24h}: 0.11 km	SEL_{24h}: 0.10 km	SEL_{24h}: 1.79 km	SEL_{24h}: 1.73 km		

[102] A dash (–) indicates the level was not reached within the limits of the modelled resolution (20 m).

Receptor	Recoverable injury		AINJ onset		TTS onset		Behaviour	
	R_{max}	$R_{95\%}$	R_{max}	$R_{95\%}$	R_{max}	$R_{95\%}$	R_{max}	$R_{95\%}$
Marine turtles	N/A		SEL_{24h}: 0.09 km	SEL_{24h}: 0.09 km	SEL_{24h}: 0.82 km	SEL_{24h}: 0.79 km	N/A	
Fish—swim bladder involved in hearing	SPL for 48 hours: –	SPL for 48 hours: –	N/A		SPL for 12 hours: 0.05 km	SPL for 12 hours: 0.05 km	N/A	
Drilling (Scenario 3)								
Low frequency cetaceans	N/A		SEL_{24h}: 0.11 km	SEL_{24h}: 0.10 km	SEL_{24h}: 1.09 km	SEL_{24h}: 1.04 km	SPL: 5.77 km	SPL: 5.54 km
High frequency cetaceans	N/A		SEL_{24h}: –	SEL_{24h}: –	SEL_{24h}: 0.20 km	SEL_{24h}: 0.20 km		
Very high frequency cetaceans	N/A		SEL_{24h}: 0.09 km	SEL_{24h}: 0.09 km	SEL_{24h}: 1.79 km	SEL_{24h}: 1.75 km		
Marine turtles	N/A		SEL_{24h}: 0.07 km	SEL_{24h}: 0.07 km	SEL_{24h}: 0.82 km	SEL_{24h}: 0.79 km	N/A	
Fish—swim bladder involved in hearing	SPL for 48 hours: –	SPL for 48 hours: –	N/A		SPL for 12 hours: 0.05 km	SPL for 12 hours: 0.05 km	N/A	
Drilling (Scenario 4)								
Low frequency cetaceans	N/A		SEL_{24h}: 0.10 km	SEL_{24h}: 0.10 km	SEL_{24h}: 1.43 km	SEL_{24h}: 1.29 km	SPL: 6.34 km	SPL: 5.93 km
High frequency cetaceans	N/A		SEL_{24h}: –	SEL_{24h}: –	SEL_{24h}: 0.25 km	SEL_{24h}: 0.24 km		
Very high frequency cetaceans	N/A		SEL_{24h}: 0.09 km	SEL_{24h}: 0.09 km	SEL_{24h}: 2.14 km	SEL_{24h}: 1.95 km		
Marine turtles	N/A		SEL_{24h}: 0.08 km	SEL_{24h}: 0.08 km	SEL_{24h}: 1.17 km	SEL_{24h}: 1.06 km	N/A	
Fish—swim bladder involved in hearing	SPL for 48 hours: –	SPL for 48 hours: –	N/A		SPL for 12 hours: 0.05 km	SPL for 12 hours: 0.05 km	N/A	

Receptor	Recoverable injury		AINJ onset		TTS onset		Behaviour	
	R_{max}	$R_{95\%}$	R_{max}	$R_{95\%}$	R_{max}	$R_{95\%}$	R_{max}	$R_{95\%}$
IMR (Scenario 5)								
Low frequency cetaceans	N/A		SEL_{24h}: 0.06 km	SEL_{24h}: 0.06 km	SEL_{24h}: 0.59 km	SEL_{24h}: 0.58 km	SPL: 2.20 km	SPL: 2.11 km
High frequency cetaceans	N/A		SEL_{24h}: –	SEL_{24h}: –	SEL_{24h}: 0.06 km	SEL_{24h}: 0.06 km		
Very high frequency cetaceans	N/A		SEL_{24h}: –	SEL_{24h}: –	SEL_{24h}: 0.19 km	SEL_{24h}: 0.19 km		
Marine turtles	N/A		SEL_{24h}: 0.05 km	SEL_{24h}: 0.05 km	SEL_{24h}: 0.51 km	SEL_{24h}: 0.50 km	N/A	
Fish—swim bladder involved in hearing	SPL for 48 hours: –	SPL for 48 hours: –	N/A		SPL for 12 hours: 0.03 km	SPL for 12 hours: 0.03 km	N/A	

Table 8-26: Animat modelling exposure range ($ER_{95\%}$)[103] to non-impulsive effect criteria for low frequency cetaceans

Receptor	Parameter	AINJ onset	TTS onset	Behaviour
Drilling (Scenario 1)				
Acoustic modelling	R_{max}	SEL_{24h}: 0.10 km	SEL_{24h}: 1.01 km	SPL: 5.70 km
	$R_{95\%}$	SEL_{24h}: 0.10 km	SEL_{24h}: 0.98 km	SPL: 5.47 km
Animat modelling	$ER_{95\%}$ (P_{exp})	SEL_{24h}: –	SEL_{24h}: 0.04 km (62%)	SPL: 1.45 km (>99%)
Drilling (Scenario 2)				
Acoustic modelling	R_{max}	SEL_{24h}: 0.11 km	SEL_{24h}: 1.03 km	SPL: 5.72 km
	$R_{95\%}$	SEL_{24h}: 0.11 km	SEL_{24h}: 0.99 km	SPL: 5.51 km
Animat modelling	$ER_{95\%}$ (P_{exp})	SEL_{24h}: –	SEL_{24h}: 0.04 km (59%)	SPL: 1.45 km (>99%)
Drilling (Scenario 3)				
Acoustic modelling	R_{max}	SEL_{24h}: 0.11 km	SEL_{24h}: 1.09 km	SPL: 5.77 km

[103] A dash (–) indicates the no animats were exposed above the effect criteria.

Receptor	Parameter	AINJ onset	TTS onset	Behaviour
	$R_{95\%}$	SEL_{24h}: 0.10 km	SEL_{24h}: 1.04 km	SPL: 5.54 km
Animat modelling	$ER_{95\%}$ (P_{exp})	SEL_{24h}: –	SEL_{24h}: 0.04 km (24%)	SPL: 1.10 km (>99%)
Drilling (Scenario 4)				
Acoustic modelling	R_{max}	SEL_{24h}: 0.10 km	SEL_{24h}: 1.43 km	SPL: 6.34 km
	$R_{95\%}$	SEL_{24h}: 0.10 km	SEL_{24h}: 1.29 km	SPL: 5.93 km
Animat modelling	$ER_{95\%}$ (P_{exp})	SEL_{24h}: –	SEL_{24h}: 0.03 km (54%)	SPL: 1.38 km (91%)
IMR (Scenario 5)				
Acoustic modelling	R_{max}	SEL_{24h}: 0.06 km	SEL_{24h}: 0.59 km	SPL: 2.20 km
	$R_{95\%}$	SEL_{24h}: 0.06 km	SEL_{24h}: 0.58 km	SPL: 2.11 km
Animat modelling	$ER_{95\%}$ (P_{exp})	SEL_{24h}: –	SEL_{24h}: –	SPL: 0.54 km (92%)

8.6.2.2 Helicopter operations

Helicopter operations may generate underwater sound emissions during take-off and landing on the MODU—when the helicopter ascends/descends to the helideck, the air borne engine sound emissions may ensonify the top of the water column.

Sound emitted from helicopter operations is typically below 500 Hz (Ref. 324). The peak-received level diminishes with increasing helicopter altitude, but the duration of audibility often increases with increasing altitude. Estimates of SPL for helicopters range 149–162 dB re 1 µPa (Ref. 324, Ref. 325). Richardson et al. (Ref. 324) report that helicopter sound was audible in air for four minutes before it passed over underwater hydrophones, but detectable underwater for only 38 seconds at 3 m depth, and 11 seconds at 18 m depth.

Given the nature of helicopter operations (e.g. crew transfers) within the scope of this EP, and based on available literature that the penetration of air-borne sounds into the water column is expected to be negligible, helicopter operations are not considered further within this impact and risk assessment.

8.6.2.3 ROV/AUV operations

The sound emissions from the propulsion systems of work class ROVs are not widely quantified in literature; however, similar to vessels they likely consist of machinery and propulsion sounds which depends upon the size, number, and speed of the propeller blades (Ref. 326). AUVs typically have few moving parts and use low propulsion power, and as such have a very low underwater sound signature (Ref. 334). Measurements of an AUV indicated a broadband (100–5,000 Hz) source level of 124 dB re 1 µPa @ 1 m (Ref. 334).

Advice from JASCO indicates that since ROVs are typically operated close to large vessels (due to the tether), the propulsion sounds are likely to be a comparatively minor contributor to the sound field and not increase effect ranges except in very close proximity to the ROV (Ref. 326). Similarly, the underwater sound radiated by the propulsion system of an AUV is typically low compared to the sounds generated by its payload device (Ref. 326).

As such, ROV and AUV operations are not considered further within this impact and risk assessment.

8.6.2.4 Acoustic survey equipment (SSS and MBES)

Acoustic survey techniques such as SSS and MBES generate non-impulsive sound emissions; however, these are high frequency sound emissions which attenuate rapidly in water. To estimate the distances at which effect criteria may be exceeded by SSS and MBES systems, JASCO utilised a simple spreading loss model to calculate estimates of sound propagation (Ref. 326). A spreading loss model was considered an appropriate modelling approach given the high frequency (and corresponding small wavelength) of the source sound.

An SSS at two different operating frequencies and two different MBES systems were modelled. Both the SSS (operating frequencies of 100 kHz and 400 kHz) and MBES (operating frequencies of 100 kHz and 300 kHz) equipment modelled would not be heard by low frequency cetaceans, fish, and turtles; and therefore no effects were predicted. The spreading loss modelling indicated the following for high and very high frequency cetaceans:

- SSS
  - maximum horizontal distance ~340–705 m for the behavioural response criterion
  - maximum distance to reach SEL_{24h} effect criteria for AINJ onset was up to ~4 m for very high frequency cetaceans; the effect criteria for high frequency cetaceans was not reached
  - maximum distance to reach SEL_{24h} effect criteria for TTS onset was up to ~1 m and ~109 m for high and very high frequency cetaceans respectively (Ref. 326).
- MBES
  - maximum horizontal distance ~565–1,212 m for the behavioural response criterion
  - maximum distance to reach SEL_{24h} effect criteria for AINJ onset was up to ~1 m and ~118 m for high and very high frequency cetaceans respectively
  - maximum distance to reach SEL_{24h} effect criteria for TTS onset was up to ~63 m and ~469 m for high and very high frequency cetaceans respectively (Ref. 326).

8.6.3 Concurrent petroleum activities

Other CAPL petroleum activities

As identified in Sections 4.4.5 and 5.4.6, there may be other CAPL petroleum activities occurring during the GS3 drilling campaign. Based on deterministic and probabilistic schedules, combinations of the following vessel-based activities may occur concurrently:

- GS3 drilling
- GS3 pipelay and/or subsea installation
- J-IC installation and/or pre-commissioning/commissioning
- Jansz umbilical installation
- backfill fields site investigation surveys for the Chrysaor and Dionysus (C&D) or Chandon fields.

JASCO undertook acoustic modelling studies (Ref. 327; Ref. 328; Ref. 335; Ref. 336; Ref. 337) to inform the impact and risk assessment associated with non-impulsive underwater sound emissions from concurrent petroleum activities.

Table 8-27 presents a range of scenarios that have been used to investigate the risks associated with potential concurrent CAPL petroleum activities. The predicted ensonified areas associated with each set of potential concurrent activities has also been presented as an approximate proportion of the width of the pygmy blue migration BIA. Depending on the combination and location of activities, these may ensonify ~19–43% (or ~15–49% based on the narrower and broader sections) of the width of the pygmy blue whale migration BIA at any one time. Note: As per the description in Section 5.3.3.1.1, pygmy blues whales have been observed to migrate through areas broader than just the BIA, particularly during their southern migration.

Based on a similar approach, an approximate worst-case length of the pygmy blue whale BIA ensonified at the SEL_{24h} TTS onset criteria has been also presented in

Table 8-27 to investigate the potential risks associated with concurrent activities and potential accumulated exposure. Given the north-east to south-west orientation of the BIA (and therefore the migrating whales) versus the general north-west to south-east spread of activities, individual whales would not typically swim through multiple ensonified areas. Travel speed for pygmy blue whales during migration was estimated by Thums et al. (Ref. 60), as ~2.4 km/h during northern migration, and ~4.0–5.0 km/h during southern migration. Using these travel speeds, the estimated duration of exposure within SEL_{24h} TTS ensonified areas was estimated at up to ~2.4 hours during northern migration or up to ~1.4 hours during southern migration (i.e. substantially less than the duration that would be required for TTS onset to occur within the SEL_{24h} ensonified area). Further it is noted that these estimates assume no behavioural effect [e.g. avoidance] occurs to reduce exposure duration.

Once installed and operational, CAPL's J-IC subsea compression station (SCSt) will be a long-term subsea source of low frequency non-impulsive sound. Given the location of the SCSt in deep water (~1,345 m), the deep ocean sound channel (centre estimated at ~800–1,000 m water depth at J-IC location) has the most significant effect on propagation of subsea sound emissions from the SCSt. Upward travelling energy away from the SCSt is refracted downward, and energy reflected from the seabed is also refracted back downward, which results in most of the acoustic energy occurring in the lower water column and less acoustic energy propagating into the upper water column (Ref. 338). Acoustic modelling of the predicted ensonified area above the behavioural effect criteria for marine mammals indicates a maximum horizontal distance from the subsea compression station of ~1.1 km, extending vertically ~950 m from the seabed to ~400 m from the sea surface (Ref. 339). Interaction between the J-IC SCSt ensonified area and any ensonified area from G&E drilling activities is not expected; as such, J-IC operations are not considered further within this impact and risk assessment.

Other operator petroleum activities

Section 5.4.6 also identifies other operator petroleum activities that may be occurring within the vicinity of the OA during the indicative schedule for the G&E drilling activities. Third-party activities that may result in non-impulsive underwater sound emissions include:

- vessel-based IMR activities along the Scarborough trunkline (Woodside)
- MODU and vessel-based activities during Julimar P&A (Woodside)
- vessel-based activities during the proposed Pluto 4D marine seismic survey (Woodside).

These activities are all spatially separate (~20 m to ~18.5 km) from the OA. However, if the activities were to occur at the same as the G&E drilling campaign, they are generally not close enough to result in overlapping ensonified areas, except potentially for the proposed seismic survey. The Pluto OA is only ~20 m from the G&E OA; however, the active source and acquisition areas (i.e. where most vessel-based activity will occur) are >11 km from the G&E OA. Any additional ensonified areas within the broader NWS area from these activities would be intermittent and temporary (e.g. weeks to months depending on the Woodside campaign).

Given the spatial separation of the non-impulsive sound sources from other operator petroleum activities to G&E, these are considered a minor contribution to

the sound field around G&E and as such are not considered further within this impact and risk assessment.

Table 8-27: Potential concurrent CAPL petroleum activity scenarios and estimated width of the pygmy blue whale migration BIA exposed to sound above the behavioural effect criteria for marine mammals

Scenario	Potential concurrent activities	Indicative vessel fleet	Indicative duration of concurrent activities	Estimated width of ensonified area(s) within the pygmy blue whale BIA above behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the TTS onset effect criteria for low frequency cetaceans
Notes for interpretating values presented in this table 1. *The 'indicative duration of concurrent activities' refers to a schedule duration (i.e. not a duration that an individual pygmy blue whale would be exposed to these activities given that their presence is seasonal and transitory).* 2. *The proportion of the width of the pygmy blue whale migration BIA[104] ensonified above the behavioural effect criteria is presented; however, as described in Section 5.3.3.1.1 migration occurs over a broader area than just the BIA.* 3. *The estimate of exposure duration based on migrating swim speeds[105] is presented to give a more realistic 'duration' of concurrent activities applicable to a migrating pygmy blue whale compared to the 'schedule duration'; noting that the behavioural effect criteria is not a cumulative exposure criteria, whereas the TTS onset effect criteria is a cumulative exposure criteria.*						
SIM-0	GS3 drilling	As per Scenario 4[106] in Table 8-23	Estimated ~6–12 months for duration of J-IC pre-commissioning/ commissioning activities.	R_{max} for the scenarios were 6.34 km and 3.89 km respectively. Therefore, potential total width of ensonified areas is ~20.5 km, which represents ~19% (15–21%) of the width of the migration BIA. Note: These activities would result in two distinct ensonified areas.	The estimated longest length of ensonified area above the behavioural effect criteria is ~12.7 km; this is based on the GS3 drilling activity as the larger of the ensonified areas. During northern and southern migrations this may result in ~5.3 hours and ~2.5–3.2 hours respectively of exposure to sound above the behavioural effect criteria	The estimated longest length of ensonified area above the TTS onset effect criteria is ~2.9 km; this is based on the GS3 drilling activity as the larger of the ensonified areas. During northern and southern migrations an animal may be within this ensonified area for ~1.2 hours and ~0.6–0.7 hours respectively (i.e. substantially less
	J-IC pre-commissioning/ commissioning	1 x MSV under DP, with a resupply vessel alongside for 8 hours				

[104] Note: The width of the pygmy blue whale migration BIA varies; as such these proportions are presented based on the distance through the centre of the Backfill Fields Development Area, and then the narrow width to the north and broader width to the south (these BIA widths are consistent with those used within the Backfill Fields Development OPP).

[105] Assumed northern migration swim speed is ~2.4 km/hr, and southern migration is ~4-5 km/hr (see Section 5.3.3.1.1).

[106] Note: Scenario 3 is the better representative scenario for the more common combination of vessels that may be in the OA for GS3 drilling activities; however, Scenario 4 has been used for the purposes of this concurrent activities risk assessment as it has a slightly larger ensonified area thereby providing a more conservative approach.

Scenario	Potential concurrent activities	Indicative vessel fleet	Indicative duration of concurrent activities	Estimated width of ensonified area(s) within the pygmy blue whale BIA above behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the TTS onset effect criteria for low frequency cetaceans
					(assuming no avoidance behaviours).	than the 24-hr duration associated with the TTS effect criteria).
SIM-1A	GS3 drilling	As per Scenario 4[106] in Table 8-23	Estimated ~2–3 months for duration of C&D survey activities.	R_{max} for the scenarios were 6.34 km, 3.89 km, and 5.61 km respectively. Therefore, potential total width of ensonified areas is ~31.7 km, which represents ~29% (23–33%) of the width of the migration BIA. Note: These activities could result in up to three distinct ensonified areas.	The estimated longest length of ensonified areas above the behavioural effect criteria is ~23.9 km; this is based on conservatively including both the GS3 drilling and C&D survey areas. During northern and southern migrations this may result in ~10.0 hours and ~4.8–6.0 hours respectively of exposure to sound above the behavioural effect criteria (assuming no avoidance behaviours).	The estimated longest length of ensonified areas above the TTS onset effect criteria is ~5.7 km; this is based on conservatively including both the GS3 drilling and C&D survey areas. During northern and southern migrations an animal may be within this ensonified area for ~2.4 hours and ~1.1–1.4 hours respectively (i.e. substantially less than the 24-hr duration associated with the TTS effect criteria).
	J-IC pre-commissioning/ commissioning	1 x MSV under DP, with a resupply vessel alongside for 8 hours				
	C&D site surveys	1 x survey vessel under DP, with a resupply vessel alongside for 8 hours[107]				
SIM-1B	GS3 drilling	As per Scenario 4[106] in Table 8-23	Estimated ~2–3 months for duration of C&D survey activities.	R_{max} for the scenarios were 6.34 km, 6.72 km, 3.89 km and 5.61 km respectively. Therefore, potential total width of ensonified areas is ~45.1 km, which represents	As above for SIM-1A.	As above for SIM-1A.
	J-IC installation and pre-	1 x heavy lift vessel (HLV) and 2 x heavy transport vessels				

[107] Note: Not all survey activities for C&D occur on the continental shelf or within the pygmy blue whale BIA; however, as a conservative approach to risk assessment the ensonified area associated with a model scenario on the continental shelf (modelled water depth ~120 m) has been used and has been assumed to occur within the BIA.

Scenario	Potential concurrent activities	Indicative vessel fleet	Indicative duration of concurrent activities	Estimated width of ensonified area(s) within the pygmy blue whale BIA above behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the TTS onset effect criteria for low frequency cetaceans
	commissioning/ commissioning	(HTVs), all under DP		~41% (33–47%) of the width of the migration BIA. Note: These activities could result in up to four distinct ensonified areas.		
		1 x MSV under DP, with a resupply vessel alongside for 8 hours				
	Jansz umbilical installation	1 x heavy construction vessel (HCV) under DP, with a resupply vessel alongside for 8 hours				
	C&D site surveys	1 x survey vessel under DP, with a resupply vessel alongside for 8 hours[107]				
SIM-2A	GS3 drilling	As per Scenario 4[106] in Table 8-23	Estimated ~2–3 months for duration of Chandon survey activities.	R_{max} for the scenarios were 6.34 km, 3.89 km, and 3.44 km respectively. Therefore, potential total width of ensonified areas is ~27.3 km, which represents ~25% (20–29%) of the width of the migration BIA. Note: These activities could result in up to three distinct ensonified areas.	As above for SIM-0.	As above for SIM-0.
	J-IC pre-commissioning/ commissioning	1 x MSV under DP, with a resupply vessel alongside for 8 hours				
	Chandon site surveys	1 x survey vessel under DP, with a resupply vessel				

Scenario	Potential concurrent activities	Indicative vessel fleet	Indicative duration of concurrent activities	Estimated width of ensonified area(s) within the pygmy blue whale BIA above behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the TTS onset effect criteria for low frequency cetaceans
		alongside for 8 hours				
SIM-2B	GS3 drilling	As per Scenario 4[106] in Table 8-23	Estimated ~2–3 months for duration of Chandon survey activities.	R_{max} for the scenarios were 6.34 km, 6.72 km, 3.89 km and 3.44 km respectively. Therefore, potential total width of ensonified areas is ~40.8 km, which represents ~37% (30–43%) of the width of the migration BIA. Note: These activities could result in up to four distinct ensonified areas.	The estimated longest length of ensonified area above the behavioural effect criteria is ~13.4 km; this is based on the combined J-IC activities. During northern and southern migrations this may result in ~5.6 hours and ~2.7–3.4 hours respectively of exposure to sound above the behavioural effect criteria (assuming no avoidance behaviours).	The estimated longest length of ensonified area above the TTS onset effect criteria is ~3.1 km; this is based on the combined J-IC activities. During northern and southern migrations an animal may be within this ensonified area for ~1.3 hours and ~0.6–0.8 hours respectively (i.e. substantially less than the 24-hr duration associated with the TTS effect criteria).
	J-IC installation and pre-commissioning/ commissioning	1 x HLV and 2 x HTVs, all under DP				
		1 x MSV under DP, with a resupply vessel alongside for 8 hours				
	Jansz umbilical installation	1 x HCV under DP, with a resupply vessel alongside for 8 hours				
	Chandon site surveys	1 x survey vessel under DP, with a resupply vessel alongside for 8 hours				
SIM-3A	GS3 drilling	As per Scenario 4[106] in Table 8-23	Estimated ~2 months for duration of GS3 pre-lay activities.	Estimated R_{max} for the concurrent scopes are 6.34 km, 3.89 km and 3.89 km respectively. Therefore, potential total width of ensonified areas is up to ~28.2 km, which	The estimated longest length of ensonified area above the behavioural effect criteria is ~12.6 km; this is based on both GS3 drilling and PIC pre-lay activities occurring in	The estimated longest length of ensonified area above the TTS onset effect criteria is ~2.6 km; this is based on both GS3 drilling and PIC pre-lay activities occurring in
	J-IC pre-commissioning/ commissioning	1 x MSV under DP, with a supply vessel alongside for 8 hours				

Scenario	Potential concurrent activities	Indicative vessel fleet	Indicative duration of concurrent activities	Estimated width of ensonified area(s) within the pygmy blue whale BIA above behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the TTS onset effect criteria for low frequency cetaceans
	GS3 pipelay (pre-lay activities)	1 x construction support vessel (CSV) under DP, with a supply vessel alongside for 8 hours		represents ~26% (21–30%) of the width of the migration BIA. Note: These activities could result in up to three discrete ensonified areas.	vicinity of G&E DC. During northern and southern migrations this may result in ~5.2 hours and ~2.5–3.1 hours respectively of exposure to sound above the behavioural effect criteria (assuming no avoidance behaviours).	vicinity of G&E DC. During northern and southern migrations an animal may be within this ensonified area for ~1.1 hours and ~0.5–0.7 hours respectively (i.e. substantially less than the 24-hr duration associated with the TTS effect criteria).
SIM-3B	GS3 drilling	As per Scenario 4[106] in Table 8-23	Estimated ~2 months for duration of GS3 pre-lay activities.	Estimated R_{max} for the concurrent scopes are 6.34 km, 6.72 km, 3.89 km and 3.44 km respectively. Therefore, potential total width of ensonified areas is up to ~40.8 km, which represents ~37% (30–43%) of the width of the migration BIA. Note: These activities could result in up to four discrete ensonified areas.	As above for SIM-2B.	As above for SIM-2B.
	J-IC installation and pre-commissioning/ commissioning	1 x HLV and 2 x HTVs, all under DP				
		1 x MSV under DP, with a supply vessel alongside for 8 hours				
	GS3 pipelay (pre-lay activities)	1 x CSV under DP, with a supply vessel alongside for 8 hours				
	Chandon site survey	1 x survey vessel under DP, with a resupply vessel alongside for 8 hours				

Scenario	Potential concurrent activities	Indicative vessel fleet	Indicative duration of concurrent activities	Estimated width of ensonified area(s) within the pygmy blue whale BIA above behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the TTS onset effect criteria for low frequency cetaceans
SIM-4A	GS3 drilling	As per Scenario 4[106] in Table 8-23	Estimated ~2 months for duration of GS3 pipelay activities.	Estimated R_{max} for the concurrent scopes are 6.34 km and 7.05 km respectively. Therefore, potential total width of ensonified areas is up to ~26.8 km, which represents ~25% (20–28%) of the width of the migration BIA. Note: These activities could result in up to two discrete ensonified areas.	The estimated longest length of ensonified area above the behavioural effect criteria is ~24.0 km; this is based on both GS3 drilling and pipelay activities occurring in vicinity of G&E DC. During northern and southern migrations this may result in ~10.0 hours and ~4.8–6.0 hours respectively of exposure to sound above the behavioural effect criteria (assuming no avoidance behaviours).	The estimated longest length of ensonified area above the TTS onset effect criteria is ~3.9 km; this is based on both GS3 drilling and PIC pipelay activities occurring in vicinity of G&E DC. During northern and southern migrations an animal may be within this ensonified area for ~1.6 hours and ~0.8–1.0 hours respectively (i.e. substantially less than the 24-hr duration associated with the TTS effect criteria).
	GS3 pipelay	1 x pipelay vessel (PLV), 1 x CSV, 2 x pipe supply vessels and 1 x general supply vessel				
SIM-4B	GS3 drilling	As per Scenario 4[106] in Table 8-23	Estimated ~2 months for duration of GS3 pipelay activities.	Estimated R_{max} for the concurrent scopes are 6.34 km, 6.72 km, 7.05 km, and 3.44 km respectively. Therefore, potential total width of ensonified areas is up to ~47.1 km, which represents ~43% (35–49%) of the width of the migration BIA. Note: These activities could result in up to three discrete ensonified areas.	As above for SIM-4A.	As above for SIM-4A.
	J-IC installation and pre-commissioning/ commissioning	1 x HLV and 2 x HTVs, all under DP				
		1 x MSV under DP, with a supply vessel alongside for 8 hours				
	GS3 pipelay	1 x PLV, 1 x CSV, 2 x pipe supply vessels and 1 x				

Scenario	Potential concurrent activities	Indicative vessel fleet	Indicative duration of concurrent activities	Estimated width of ensonified area(s) within the pygmy blue whale BIA above behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the behavioural effect criteria for marine mammals	Potential duration of exposure of a pygmy blue whale above the TTS onset effect criteria for low frequency cetaceans
		general supply vessel				
	Chandon site survey	1 x survey vessel under DP, with a resupply vessel alongside for 8 hours				
SIM-6B	GS3 drilling	As per Scenario 4[106] in Table 8-23	Estimated ~4 month for duration of subsea installation.	Estimated R_{max} for the concurrent scopes are 6.34 km and 4.46 km respectively. Therefore, potential total width of ensonified areas is up to ~21.6 km, which represents ~20% (16–23%) of the width of the migration BIA. Note: These activities could result in up to two discrete ensonified areas.	The estimated longest length of ensonified area above the behavioural effect criteria is ~12.9 km; this is based on both GS3 drilling and subsea installation occurring in vicinity of G&E DC. During northern and southern migrations this may result in ~5.4 hours and ~2.6–3.2 hours respectively of exposure to sound above the behavioural effect criteria (assuming no avoidance behaviours).	The estimated longest length of ensonified area above the TTS onset effect criteria is ~2.9 km; this is based on both GS3 drilling and subsea installation activities occurring in vicinity of G&E DC. During northern and southern migrations an animal may be within this ensonified area for ~1.2 hours and ~0.6–0.7 hours respectively (i.e. substantially less than the 24-hr duration associated with the TTS effect criteria).
	GS3 subsea installation	1 x HCV and 1 x DPTV under DP, with a supply vessel alongside for 8 hours				

8.6.4 Environmental impact and risk evaluation

Non-impulsive underwater sound emissions may result in a:

- localised and temporary change in ambient underwater sound.

A localised and temporary change in ambient underwater sound may result in a:

- potential change in behaviour of marine fauna
- potential auditory impairment or injury to marine fauna.

8.6.4.1 Consequence evaluation

8.6.4.1.1 Impact: Localised and temporary change in ambient underwater sound

Non-impulsive underwater sound emissions from the petroleum activity will locally increase underwater sound levels from ambient levels.

Underwater acoustic recordings between 2006 and 2017 from the NWS found natural physical processes (e.g. wind), anthropogenic (e.g. ships) and biological noise (e.g. whale song) contributed to the soundscape for the region (Ref. 340).

Underwater broadband ambient sound spectrum levels range from 45–60 dB re 1 µPa in quiet regions (light shipping and calm seas) to 80–100 dB re 1 µPa for more typical conditions, and >120 dB re 1 µPa during periods of high winds, rain or 'biological choruses' (many individuals of the same species vocalise near simultaneously in reasonably close proximity to each other (Ref. 341). Low-frequency ambient sound levels (20–500 Hz) are frequently dominated by distant shipping plus some great whale species. Above the 300–400 Hz range weather-related sounds exceed shipping sounds, and wind wave conditions and nearby rainfall dominate the 500–50,000 Hz range (Ref. 341). Soundscape monitoring in the Jansz area undertaken during 2021–2023 (Ref. 50) identified that the dominant sources of sound at low frequencies (<100 Hz) were shipping and baleen whales, and in the mid-frequencies (0.1–1 kHz) was wind.

Non-impulsive underwater sound can be generated from multiple sources (Sections 8.6.1 and 8.6.2) associated with the petroleum activity. All sources are temporary, with durations varying in the order of seconds to minutes (e.g. helicopters), days or weeks (e.g. acoustic surveys), and up to ~18 months for drilling activities (including associated MODU and vessels).

Acoustic modelling of underwater sound levels associated with MODU/vessel-based activities for the petroleum activity found the largest radii to effect criteria (marine mammal behavioural effect) was ~6.34 km (Table 8-25). Potential concurrent CAPL petroleum activities may result in multiple separate ensonified areas (Section 8.6.3; Table 8-27).

The consequence of causing a localised and temporary change in ambient underwater sound from non-impulsive sound sources has been assessed as Incidental (6) and the soundscape will return to ambient levels upon completion of the activity.

8.6.4.1.2 Risk: Potential change in behaviour of marine fauna

Marine mammals

Acoustic modelling indicated that the R_{max} from the source to SPL behavioural effect criteria for marine mammals was up to ~6.34 km for drilling activities and ~2.20 km for IMR (Table 8-25).

As identified in Section 5.3.3.1, several cetacean species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. The threatened and/or migratory cetaceans that may be present within the OA are predominantly low and high frequency cetaceans. Very high frequency cetaceans were also identified within the PMST report as species or species habitat that may occur within the OA; however, these species are not listed as threatened and/or migratory under the EPBC Act.

The predicted ensonified area above the behavioural effect criteria for marine mammals also intersects with the migration BIA for pygmy blue whales. The presence of pygmy blue whales within the Jansz region has been recorded from late-March to mid-September (peak late-May to June) during northern migration, and during early-October to late-January (peak late-November and early-December) for the southern migration (Section 5.3.3.1.1; Table 5-17).

Except for pygmy blue whales, there are no other known BIAs, HCTS of the species, or aggregation areas for other cetacean species that intersect with the OA; as such, it is expected that any presence of cetacean species would be of a transitory nature.

Behavioural changes to marine mammals from underwater sound may include alterations of dive patterns, swim speeds, swim orientation, group cohesiveness, and changes in acoustic behaviour (Ref. 342). However, given the largest predicted R_{max} of ~6.34 km, the energetic cost of avoiding the sound source is small in the context of the greater migratory and/or transitory movements (e.g. several thousands of kilometres) of the cetacean species that may be present within the vicinity of the OA.

Pygmy blue whales

A more realistic prediction of non-impulsive underwater water sound exposures for migrating pygmy blue whales was undertaken using animat modelling (Section 8.6.2.1). For the modelled scenarios, the maximum exposure range ($ER_{95\%}$) to reach the behavioural effect criteria for marine mammals was up to ~1.45 km for drilling activities and ~0.54 km for IMR activities (Table 8-26); this is a reduction of ~75–81% in predicted ensonified area for pygmy blue whales. This ensonified area would intersect up to ~2.9 km of the pygmy blue whale migration BIA. The width of the pygmy blue whale BIA varies; based on a width range of ~95.2–135.3 km, this ensonified area represents ~2–3% of the BIA width. The energetic cost of avoiding the non-impulsive sound emissions from the petroleum activity (e.g. a few kilometres) is small in the context of the greater migratory movements (e.g. several thousands of kilometres) of pygmy blue whales migrating between Southern Ocean and Indonesian waters (Section 5.3.3.1.1). Therefore, this level of behavioural avoidance within the pygmy blue whale migration BIA is highly unlikely to alter the overall energy budget of migrating whales.

As described in the *Conservation Management Plan for the Blue Whale* (Ref. 52), Foraging Areas for blue whales are generally associated with areas of high primary productivity that can support sufficient densities of krill, such as oceanographic upwelling or frontal systems. There are no defined ‘Foraging Areas’ or ‘Known Foraging Areas’ within north-west WA. The closest of these types of areas to the OA are described as ‘Possible Foraging Areas’ (Ref. 52) and are ~220 km south-west (around Ningaloo/North West Cape) and ~880 km north-east (around Scott Reef) of the OA. Thums et al. (Ref. 60) identified ‘most important areas’ for foraging for the pygmy blue whale based on proxy indicators. The use of these ‘most important areas’ is not expected to be continual throughout

the year but associated with pygmy blue whale presence during migration periods. The OA does not intersect with any of these 'most important areas' for foraging (Figure 5-5). As the predicted ensonified area above the behavioural effect criteria for marine mammals is only slightly larger than the OA (even conservatively applying IMR activities at the boundary of the OA), no overlap with these 'most important areas' for foraging is expected.

Pygmy blue whales have been observed to exhibit traits of a mixed capital-income breeding strategy, utilising both known foraging areas and intermittent/opportunistic foraging (Ref. 64). Habitat suitability analyses describes the north-west of WA (extending offshore from the continental shelf) as suitable foraging habitat; however notes that the suitability of habitat is related to dynamic and localised oceanic processes that may occur at different temporal scales (Ref. 62; Section 5.3.3.1.1). Opportunistic foraging areas are also known to be dynamic given their dependence on presence of prey (Ref. 60; Ref. 65). Tagging studies suggest a reliance on more ephemeral prey in north-west Australia compared to south-west Australia where whales have high residency (Ref. 64).

A review by UWA demonstrated that there were no oceanographic features (including bathymetry, currents and eddies, chlorophyll concentrations) within the Jansz area that may lead to higher primary productivity and/or an increased likelihood of pygmy blue whale foraging in the area (Ref. 68; Section 5.3.3.1.1). Sonar surveys to determine the presence of sufficient biomass of prey to support foraging pygmy blue whales were undertaken by CMST (Ref. 69). This study indicated that the Jansz area may be able to support opportunistic feeding in surface waters (<100 m water depth) for short durations (hours); however, in comparison to known prey aggregations observed at Perth Canyon, the biomass observed at the Jansz area is unlikely to represent a consistent and reliable feeding area (Ref. 69). Therefore, the OA and surrounding area is not considered to represent a Foraging Area, but may provide opportunistic foraging if the environmental conditions provide for the aggregation of prey at sufficient quantities at the time a pygmy blue migrates through the area. This is consistent with studies of tagged pygmy blue whales that demonstrated more opportunistic foraging in north-west Australia, compared to southern areas (e.g. Perth Canyon, Ningaloo) (Ref. 64).

Therefore, while a small proportion of the pygmy blue whale migration BIA may be ensonified above behavioural effect criteria by the petroleum activity, for this to interrupt opportunistic foraging also requires the presence of prey to coincide with the transit of a migrating whale. The energetic cost of disturbing an opportunistic feeding event for a pygmy blue whale within or adjacent to the OA is likely to be small in the context of the greater migratory movements (e.g. several thousands of kilometres) and therefore the scale of potential opportunistic foraging between Southern Ocean and Indonesian waters.

Summary

The worst-case consequence of non-impulsive sound resulting in a change in the behaviour of up to a small proportion of the migrating pygmy blue whale population and this subsequently causing a reduction in fitness due to deviations in migratory path or disturbance of an opportunistic foraging event, has been assessed as Minor (5) as the individuals are expected to recover in the short-term and with no long-term effect on population viability.

As there are no other known BIAs, HCTS of the species, or aggregation areas for other marine mammal species that intersect with the OA, the consequence of a

change in the behaviour of a small number of transitory or migratory individuals of other marine mammal species is considered to be lower than that determined for pygmy blue whales.

Concurrent activities

Acoustic modelling was used to consider the aggregate contribution of non-impulsive sound emissions from potential concurrent CAPL petroleum activity scenarios (Section 8.6.3). The concurrent scenarios may result in several discrete ensonified areas at the same time; some of these may overlap for periods (e.g. due to the moving vessels during survey, pipelay, or umbilical installation scopes), including potential overlaps with the G&E drilling ensonified area.

These concurrent CAPL petroleum activities will ensonify a greater area of the pygmy blue whale BIA compared to G&E drilling in isolation, and as such this forms the basis of the following evaluation.

Based on the range of potential concurrent activity scenarios that are described in Section 8.6.3, the cumulative ensonified area above the marine mammal behavioural effect criteria may vary from ~19–43% (or ~15–49% based on the narrower and broader sections) of the width of the migration BIA for the pygmy blue whale (Table 8-27). However, as described in Section 5.3.3.1.1, the actual migration corridor utilised by pygmy blue whales is broader that the designated BIA (during both northern and southern migrations) and as such the proportion of migratory corridor exposed to sound above the behavioural effect criteria would be lower than what is predicted above. For the same range of potential concurrent activity scenarios, the estimated duration a pygmy blue whale may be exposed to sounds above the behavioural effect criteria ranged ~5.2–10.0 hours during northern migration or ~2.5–6.0 hours during southern migration (Table 8-27).

Therefore, underwater sound associated with the potential concurrent CAPL petroleum activities may result in individual migrating pygmy blue whales making spatial deviations within the migration BIA; however, the energetic cost of these deviations (e.g. tens of kilometres) is small in the context of the greater migratory movements (e.g. thousands of kilometres). Further, there is no evidence to indicate that sound levels below the behavioural effect criteria would elicit a behavioural response from marine mammals. As such, for the case of multiple discrete ensonified areas, it would be expected that a marine mammal would be able to travel between these areas without disturbance.

Depending on the particular combination of activities, there may be some overlap between the ‘most important areas’ for foraging and the predicted ensonified areas above the behavioural effect criteria. However, as described above, the use of these areas is not expected to be continual throughout the year but associated with pygmy blue whale migration. Foraging in the vicinity of the Jansz area is opportunistic and dependent on the presence of prey in sufficient quantities. There are no geomorphic or oceanographic features present in the Jansz area that would provide for a consistent and reliable food source. Therefore, the energetic cost of disturbing an opportunistic feeding event for a pygmy blue whale within the area of CAPL activities is small in the context of the greater migratory movements (e.g. several thousands of kilometres) and therefore the scale of potential opportunistic foraging events between Southern Ocean and Indonesian waters.

The occurrence of multiple temporary ensonified areas at any one time from concurrent CAPL petroleum activities is not expected to change the predicted consequence as evaluated for the individual petroleum activity.

Marine reptiles

Quantitative effect criteria for behavioural responses of marine turtles from non-impulsive sound do not currently exist (Ref. 332). Based on qualitative guidelines from Popper et al. (Ref. 332;Table 8-24) there is a high risk of a behavioural effect in marine turtles within the tens to hundreds of metres from the source; this risk reduces to moderate at hundreds of metres, and low at thousands of metres from the source.

As identified in Section 5.3.3.2, several marine turtle species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA; however, the OA does not overlap with any BIAs or HCTS of the species. Given the OA is in deep (>1,100 m) offshore waters (~75 km to the nearest island), any marine turtle presence is expected to be transient individuals.

The *Recovery Plan for Marine Turtles in Australia* states that marine turtles do not have external ears, but potentially use sound for navigation, locating prey and avoiding predators (Ref. 291). However, at this time there is no evidence that marine turtles have the anatomical structures needed for echolocation (Ref. 357); whereas their use geomagnetic, water movement (including wave direction), or light cues to navigate has been observed (e.g. Ref. 357; Ref. 358; Ref. 359). The *Recovery Plan for Marine Turtles in Australia* (Ref. 291) identifies noise interference as a key threat; however also acknowledges that it is not known how marine turtles are affected by sound. Some field evidence has suggested that marine turtles avoid impulsive sound; however, the source of agitation could not be identified, and the avoidance could have been to the vessel and towed equipment themselves (Ref. 332).

The worst-case consequence of non-impulsive sound resulting in a change in the behaviour of a small number of transitory marine turtles and then subsequently causing a reduction in fitness due to deviations in transitory path, has been assessed as Incidental (6).

Concurrent activities

Potential concurrent CAPL petroleum activities may result in multiple discrete ensonified areas (Section 8.6.3). However, given the predicted distances for behavioural responses in transient marine turtles to occur (i.e. tens to hundreds of metres from a source), the existence of multiple discrete ensonified areas at any one time is not expected to change the predicted consequence as evaluated for the individual petroleum activity.

Fishes, including sharks and rays

Quantitative effect criteria for behavioural responses of fishes from non-impulsive sound do not currently exist (Ref. 332). Based on qualitative guidelines from Popper et al. (Ref. 332; Table 8-25) there is a moderate to high risk of a behavioural effect in fish (with and without swim bladders), and fish eggs and larvae within the tens to hundreds of metres from the source; this risk reduces to low at thousands of metres from the source.

As identified in Section 5.3.3.3, several fish (including sharks and ray) species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA; however, the OA does not overlap with any BIAs or HCTS of species.

The fish assemblages observed during surveys (Ref. 33) indicated that deeper sites were characterised by Carangidae, Macrouridae, Halosauridae and unidentified anguilliform (eel-like) fishes (Section 5.3.3.3). That is, there may be

fishes with and without swim bladders present within the OA. Observations during the surveys were predominantly of pelagic fishes (Ref. 33); these types of species are generally considered mobile and/or transient in nature (Ref. 78). Demersal fishes were also observed throughout soft sediment habitats (Ref. 33), however are also generally mobile taxa without any site attachment (Ref. 78).

The worst-case consequence of non-impulsive sound resulting in a change in the behaviour of a small number of transitory fishes and then subsequently causing a reduction in fitness due to deviations in transitory path, has been assessed as Incidental (6).

Concurrent activities

Potential concurrent CAPL petroleum activities may result in multiple discrete ensonified areas (Section 8.6.3). However, given the predicted distances for behavioural responses in transient fishes to occur (i.e. tens to hundreds of metres from a source), the existence of multiple discrete ensonified areas at any one time is not expected to change the predicted consequence as evaluated for the individual petroleum activity.

8.6.4.1.3 Risk: Potential auditory impairment or injury to marine fauna

Marine mammals

Non-impulsive underwater sound may cause auditory impairment (e.g. TTS, masking) or auditory injury (e.g. AINJ) to marine mammals. TTS is considered to be a recoverable impairment, with 24 hours thought to be sufficient for recovery to occur (Ref. 329; Ref. 343). However, with respect to pygmy blue whales, guidance from the Australian Government has defined both TTS and PTS as an auditory injury (Ref. 333).

Auditory masking may occur when there is a reduction in audibility for one sound (signal) caused by the presence of another sound (noise), impeding the ability of an animal to perceive a signal (Ref. 344, Ref. 345). For this to occur, the noise must be loud enough and have a similar frequency to the signal, and both signal and noise must occur at the same time. Masking and the potential effects of masking on communication and listening space of marine mammals are not fully understood and remain an area of active research (Ref. 346, Ref. 347, Ref. 348, Ref. 349; Ref. 351). Currently, there are no specific received level thresholds for reliably assessing or regulating masking responses to underwater sound (Ref. 350). The distance at which masking may occur is related to multiple factors, including signal and sound source characteristics, the location of signal, source, and receiver, and the spectral and temporal variation in acoustic propagation (Ref. 345). Some cetaceans might respond acoustically to underwater sound in a range of ways, including by increasing the amplitude of their calls (Lombard effect), changing their spectral (frequency content) or temporal vocalisation properties, and in some cases, cease vocalising (Ref. 352, Ref. 353, Ref. 354, Ref. 355, Ref. 356). Given the source spectra of the MODU and/or vessels within the OA would overlap with the hearing frequency ranges of marine mammals that may be transiting through the OA, it is possible that some temporary masking of calls may occur.

Acoustic modelling predicted that the maximum horizontal distance (R_{max}) to the AINJ onset effect criteria for low and very high frequency cetaceans was up to ~110 m for drilling activities; the effect criteria was not reached for high frequency cetaceans (Table 8-25). Similarly, the R_{max} to the
AINJ onset effect criteria for low frequency cetaceans was ~60 m for IMR

activities; and not reached for high or very high frequency cetaceans (Table 8-25). In addition, the animat modelling indicated that no pygmy blue whales were exposed above the AINJ effect criteria from either drilling or IMR activities (Table 8-26). Note: The AINJ effect criteria is an accumulated exposure metric. The predicted radius for SEL_{24h} effect criteria does not mean that an animal travelling within this radius of the source will be impacted, but rather that an animal could experience auditory injury if the total accumulated sound energy it receives within the ensonified area exceeds the relevant AINJ onset criteria within a 24-hour period. Theoretically the onset of AINJ effects may also be reached by shorter durations of exposure at higher sound levels. However, given that cetaceans (if present) are expected to be transitory within the vicinity of the OA, the risk of accumulated sound exposure at those close distances for AINJ onset to occur is not considered credible. As such AINJ to cetaceans is not considered credible and has not been considered further.

Acoustic modelling predicted the R_{max} to the TTS onset effect criteria for low, high, and very high frequency cetaceans was up to ~1.43 km, ~0.25 km, and ~2.14 km respectively for drilling activities (Table 8-25). Similarly, the R_{max} to the TTS onset effect criteria for low, high, and very high frequency cetaceans was ~0.59 km, ~0.06 km, and ~0.19 km respectively for IMR activities (Table 8-25). In addition, the animat modelling for pygmy blue whale predicted maximum exposure ranges ($ER_{95\%}$) of ~0.04 km (~40 m) for TTS onset from drilling activities (i.e. an ~96–98% reduction from the predictions based on acoustic propagation modelling); the effect criteria was not reached for IMR activities (Table 8-26).

While animat modelling is not available for other low frequency or very high frequency cetaceans, similar results to the modelling for pygmy blue whales is expected in that the $ER_{95\%}$ would be significantly reduced from the R_{max} effect radii predicted from acoustic propagation modelling. Further, similar to AINJ above, the TTS onset effect criteria is an accumulated exposure metric. As all cetaceans are expected to be transient within the vicinity of the OA, and that behavioural responses are predicted at distances much larger than those for TTS onset, the risk of accumulated sound exposure for TTS onset to occur in cetaceans is not considered credible and has not been considered further.

The worst-case consequence of non-impulsive sound resulting in localised masking effects of up to a small proportion of the migrating pygmy blue whale population and this subsequently causing a reduction in fitness due, has been assessed as Minor (5) as the individuals are expected to recover in the short-term and with no long-term effect on population viability. As there are no other known BIAs, HCTS of the species, or aggregation areas for other marine mammal species that intersect with the OA, the consequence of localised masking effects in a small number of transitory or migratory individuals of other marine mammal species is considered to be lower than that determined for pygmy blue whales.

Concurrent activities

Acoustic modelling was used to consider the aggregate contribution of non-impulsive sound emissions from potential concurrent CAPL petroleum activity scenarios (Section 8.6.3). The concurrent scenarios may result in several discrete ensonified areas at the same time; some of these may overlap for periods (e.g. due to the moving vessels during survey, pipelay, or umbilical installation scopes), including potential overlaps with the G&E drilling ensonified area.

For risk assessment purposes, an estimate of the time a migrating pygmy blue whale may be within an ensonified area for the SEL_{24h} TTS onset effect criteria

was presented in Section 8.6.3. During potential concurrent CAPL petroleum activities estimates of the duration a pygmy blue whale may be within a SEL_{24h} TTS ensonified area were determined as ~0.5–2.4 hours (Table 8-27); i.e. all substantially less than the 24 hours duration required within this SEL_{24h} ensonified area before TTS onset may occur. Like pygmy blue whales, other low, high, and very high frequency cetaceans are expected to be transient within the vicinity of the OA, and therefore the accumulated exposure for all hearing groups above the TTS onset effect criteria is not considered credible.

Given the mobile and transient nature of cetacean presence within the vicinity of the OA, the occurrence of multiple discrete ensonified areas at any one time is not expected to change the predicted consequence as evaluated for the individual petroleum activity.

Marine reptiles

Non-impulsive underwater sound may cause mortality/mortal injury, auditory impairment (e.g. TTS, masking) or auditory injury (e.g. recoverable injury, AINJ) to marine turtles. Little is known about hearing and the role of sound for marine turtles due to a lack of studies being conducted that examine these physiological effects (Ref. 332). The existing effect criteria for AINJ and TTS onset have been developed using marine turtle composite audiograms which were derived from existing hearing data from freshwater turtles (Ref. 331).

Based on the qualitative guidelines from Popper et al. (Ref. 332;Table 8-23) there is a low risk of mortality and potential mortal injury or recoverable injury to marine turtles at all relative distances from the source. As such mortality, potential mortal injury, and recoverable injury to marine turtles is not considered credible and has not been considered further.

Based on the qualitative guidelines, there is a high risk of masking within tens to hundreds of metres from the sound source (Ref. 332;Table 8-23). Non-impulsive sound of any level that is detectable by a marine turtle can mask signal detection, and thus may have a pervasive effect on behaviour; however, the consequences of this masking and any attendant behavioural changes for the survival of marine turtles are unknown (Ref. 332).

Results from acoustic modelling against the quantitative effect criteria for AINJ and TTS onset indicated that the maximum distance to effect criteria for marine turtles was ~90 m and ~1.17 km respectively for drilling activities, and ~50 m and ~510 m for IMR activities (Table 8-25).

Note: The TTS and AINJ effect criteria are an accumulated exposure metrics. The predicted radius for SEL_{24h} effect criteria does not mean that an animal travelling within this radius of the source will be impacted, but rather that an animal could experience auditory impairment or injury if the total accumulated sound energy it receives within the ensonified area exceeds the relevant TTS or AINJ effect criteria within a 24-hour period. Theoretically the onset of these TTS and AINJ effects may also be reached by shorter durations of exposure at higher sound levels. However, given the OA is in deep (>1,100 m) offshore waters (~75 km to the nearest island), any marine turtle presence is expected to be only transient individuals, which would therefore reduce the risk of auditory effects from accumulative sound exposures at small distances from the sound source from occurring. As such TTS and AINJ to turtles is not considered credible and has not been considered further.

The worst-case consequence of non-impulsive sound resulting in localised masking effects to a small number of transitory marine turtles and then subsequently causing a reduction in fitness, has been assessed as Incidental (6).

Concurrent activities

Potential concurrent CAPL petroleum activities may result in multiple discrete ensonified areas (Section 8.6.3). However, given the predicted distances for masking in marine turtles to occur (i.e. tens to hundreds of metres from a source) and the transient nature of marine turtles within the vicinity of the OA, the occurrence of discrete ensonified areas at any one time is not expected to change the predicted consequence from that evaluated for the individual petroleum activity.

Fishes, including sharks and rays

Non-impulsive underwater sound may cause mortality/mortal injury, auditory impairment (e.g. TTS, masking) or auditory injury (e.g. recoverable injury) of fishes. PTS does not occur in fish due to hair cells within the ear constantly being added and replaced when damaged (Ref. 332). Quantitative effect criteria for mortality or auditory impairment to most fishes do not currently exist (Ref. 332).

Based on the qualitative guidelines from Popper et al. (Ref. 332;Table 8-23) there is a low risk of mortality or potential mortal injury in fish (with and without swim bladders), fish eggs and fish larvae, at all relative distances from the source. Further, Popper at al. (Ref. 332) note that there is no direct evidence of mortality or potential mortal injury to fishes from vessel sound emissions. As such, mortality or potential mortal injury to fishes (including sharks) is not considered credible and has not been considered further.

Based on qualitative guidelines from Popper et al. (Ref. 332;Table 8-23) there is a low risk of recoverable injury to fish with no swim bladder, fish with a swim bladder not involved in hearing, fish eggs and fish larvae at all relative distances from the source. For fish with a swim bladder involved in hearing, acoustic modelling indicated that the effect criteria for recoverable injury was not reached (Table 8-25). As such recoverable injury to fishes (including sharks) is not considered credible and has not been considered further.

Based on the qualitative guidelines from Popper et al. (Ref. 332;Table 8-23) there is a moderate risk of TTS onset in fish with no swim bladder (including sharks) and fish with a swim bladder not involved in hearing within tens of metres from the source; this risk reduces to low within hundreds of metres of the source. The risk of TTS onset in fish eggs and fish larvae is low at all relative distances from the source (Ref. 332;Table 8-23). For fish with a swim bladder involved in hearing, acoustic modelling against the quantitative effect criteria for TTS onset indicated that fish within ~50 m of drilling activities or ~30 m for IMR activities for an extended (12 hour) period may be at risk (Table 8-25). While experiencing TTS, fishes may have decreased fitness through impaired communication, prey and predator detection (Ref. 332). However, Popper and Hawkins (Ref. 360) report that fish that showed TTS recovered to normal hearing levels within hours to several days.

It is important to note that the modelled non-impulsive MODU/vessel sound sources assume the radiating sound is emanating from a single point source; whereas in reality the sound will be emanating from each individual thruster, some of which have significant spatial separation (reflective of the length of the vessels) beyond the predicted range of TTS onset. Accordingly in real world conditions it is

not considered credible that the quantitative effect criteria associated with TTS onset for fishes with swim bladders involved in hearing would be reached.

Based on the qualitative guidelines from Popper et al. (Ref. 332;Table 8-23) there is a moderate to high risk of masking to fish (with and without swim bladders) at all relative distances from the source; this differs to fish eggs and fish larvae which are considered at high risk within tens of metres, but the risk reduces to low at thousands of metres (Ref. 332;Table 8-23). Non-impulsive sound of any level that is detectable by fishes can mask signal detection, and thus may have a pervasive effect on fish behaviour; however, the consequences of this masking and any attendant behavioural changes for the survival of fishes are unknown (Ref. 332).

The worst-case consequence of non-impulsive sound resulting in localised masking effects, or the potential for accumulated TTS onset, to a small number of transitory fishes and then subsequently causing a reduction in fitness, has been assessed as Incidental (6).

Concurrent activities

Potential concurrent CAPL petroleum activities may result in discrete separate ensonified areas (Section 8.6.3). However, given the predicted distances for auditory impairment in transient fish to occur (i.e. tens to thousands of metres from a source), the occurrence of existence of multiple discrete ensonified areas at any one time is not expected to change the predicted consequence from that evaluated for the individual petroleum activity.

8.6.4.2 Control measures

Table 8-28 and Table 8-29 describe the control measures relevant to this aspect.

Table 8-28: Good practice control measures for planned emissions—underwater sound (non-impulsive)

Control measure	Description
CM-17: Vessels under transit or on standby within the OA (cetacean).	For vessels under transit or on standby within the OA, the following caution and approach zones (and associated vessel speeds) will be implemented: • caution and no approach zones for cetaceans as described in EPBC Regulations 2025 – Part 8 Division 8.1 – Interacting with cetaceans (Cth) • vessels must operate at ≤6 knots within caution zones or when moving away to maintain a no-approach zone or separation distance. Note: For caution zones applicable to managing potential risks to pygmy blue whales associated with underwater sound emissions, refer to **CM-19**.
CM-18: Helicopters under transit within the OA.	For helicopters under transit within the OA, the following marine fauna interaction requirements will be implemented: • height and distance from cetaceans as described in EPBC Regulations 2025 – Part 8 Division 8.1 – Interacting with cetaceans (Cth).

Table 8-29: Additional control measures evaluated for planned emissions—underwater sound (non-impulsive)

Control measure	Benefit	Cost
Adjust petroleum activity schedule to avoid presence of EPBC listed threatened and/or migratory species.	Altering the timing of the drilling activity to avoid overlap with the predicted seasonal presence of protected marine fauna within the OA may consequently reduce the likelihood (and residual risk) of behavioural and/or auditory	N/A

Control measure	Benefit	Cost
	impairment or injuries occurring. However, as shown in Table 5-17, activities during any month of the year will result in the overlap with the presence of some protected marine fauna, and therefore avoidance of all seasonal sensitivities is not possible.	
Adjust petroleum activity schedule to avoid predicted peak migration periods for pygmy blue whales.	Altering the timing of the drilling activity to avoid the predicted peak migration periods for pygmy blue whales may consequently reduce the likelihood (and residual risk) of behavioural and/or auditory impairment or injuries occurring. The predicted peak migration periods in the Jansz region for pygmy blue whales are May–June (northern) and November–December (southern) (Table 5-17). Scheduling the G&E drilling campaign to avoid the predicted peak migration periods for pygmy blue whales is not possible without extending the duration the petroleum activity over additional years and migratory seasons (e.g. the G&E drilling campaign is estimated to take ~12–18 months; avoiding peak migration periods would add an additional ~4–8 months to the overall duration). Further, a change in the schedule to avoid peak migration periods is not expected to result in a significant risk reduction (i.e. would remain categorised as 'Low"). The schedule change may also introduce other environmental, operational, and/or safety risks (e.g. if the MODU was to remain in-field on standby, or de-mobilise and re-mobilise, etc.).	The cost of implementing temporal schedule restrictions to avoid peak migration periods is considered grossly disproportionate to the minor environmental benefit (and no significant reduction in residual risk) they may provide for pygmy blue whales, and the potential increase in operational/safety risks. Therefore, control measure has not been adopted for use.
CM-19: Vessels under transit or on standby during within the OA—extended caution zone for pygmy blue whales.	Action A.2.3 of the Conservation Management Plan for the Blue Whale (Ref. 52) refers to managing underwater sound such that pygmy blue whales are not displaced from a foraging area. As described in Section 5.3.3.1.1, the OA is not considered to represent a Foraging Area, but may provide opportunistic foraging if the environmental conditions provide for the aggregation of prey at sufficient quantities at the time a pygmy blue migrates through the area. Increasing the caution zone for vessels under transit or on standby (i.e. beyond the 300 m for whales under EPBC Regulations 2025) may reduce the likelihood of exposure of a migrating pygmy blue whale to	The detection of pygmy blue whales within the vicinity of transiting/standby vessels may lead to increased activity duration and overall costs due to deviations and/or delays. However, the environmental benefit of reducing potential impacts to pygmy blue whales is considered to outweigh the operational and financial costs from not implementing this control. Therefore, this control measure has been adopted for use.

Control measure	Benefit	Cost
	underwater sound at levels that may elicit a behavioural response which may subsequently interrupt an opportunistic foraging event (if one was occurring at the time). However, it is also noted that the energetic cost of disturbing an opportunistic feeding event for a pygmy blue whale within or adjacent to the OA is likely to be small (see Section 8.6.4.1.2). Animat modelling for vessels operating under DP predicted an $ER_{95\%}$ radial distance of ~1.45 km for the drillship and 0.54 km from the IMR vessel (Scenario 1 and 5; Table 8-26). A MODU/vessel operating under DP will generate louder underwater sound than those transiting or on standby, and as such the adoption of these distances from animat modelling provides a highly conservative approach to defining a caution zone for vessels transiting or on standby within the OA. See also Section 10.4. Note: The requirements relating to no approach zones and vessel speed remain consistent with those for whales under the EPBC Regulations in CM-17.	
Vessels under transit or on standby during within the OA—extended caution zone for other whale species	While the PMST report and CAPL soundscape monitoring do indicate the potential presence of other threatened and/or migratory whale species within the vicinity of the OA, there are no known BIAs, HCTS, or aggregation areas for other whale species that intersect with the OA. The closest BIA is a migration BIA for the humpback whale, ~48 km from the OA. Further, where conservation advices do exist for these species (i.e. fin and sei whales), no management actions relating to underwater sound have been identified. All three of these species (humpback, fin, and sei) are also capital breeders, and are not expected to feed while migrating. The presence of other whale species is expected to be of a transitory nature, and at lower abundance levels (compared to pygmy blue whales given the location of the OA within a migration BIA). While increasing the caution zone for other whale species (i.e. beyond the 300 m under EPBC Regulations 2025) may reduce the likelihood of exposure of a transiting or migrating	N/A

Control measure	Benefit	Cost
	whale to underwater sound at levels that may elicit a behavioural response, the energetic cost of this behavioural disturbance is considered minimal (see Section 8.6.4.1.2). As such the environmental benefit of an increased caution zone for other whale species is considered of negligible environmental benefit and would not significantly reduce the residual risk. No further evaluation has been undertaken.	
Vessels undertaking resupply—shutdown zones.	Underwater sound that radiates from vessels is produced mainly by propeller and thruster cavitation, with a smaller proportion produced by sound transmitted through the hull, such as by engines, gearing, and other mechanical systems (Ref. 327). Sound levels tend to be the highest when thrusters are used to position the vessel and when the vessel is transiting at high speeds (Ref. 327). During vessel resupply to the MODU, the vessel will be holding station alongside the MODU, and as such the predominant sound source is from the use of DP to hold position. Animat modelling indicated that during drilling with and resupply (Scenario 2), the $ER_{95\%}$ distance to the behavioural effect criteria for pygmy blue whales was ~1.45 km (Ref. 327). However, animat modelling for drilling activities alone (Scenario 1) also indicated that the $ER_{95\%}$ distance to the behavioural effect criteria for pygmy blue whales was ~1.45 km (Ref. 327). This is due to the source level of the drillship being much higher than the PSV (~11 dB higher; Table 8-23), and therefore the PSV has a negligible effect on the cumulative sound field. Therefore, removing the use of vessel DP during resupply would not reduce the sound emissions or predicted ensonified area. In addition, when a vessel is holding position, the DP system is a critical safety device to avoid potential impact to other infrastructure (e.g. the MODU itself), and therefore removing it would introduce a significant safety risk to the operation. As this control measure is not providing an environmental or risk reduction benefit, no further evaluation has been undertaken.	N/A.

Control measure	Benefit	Cost
CM-20a: Pre Start-up Visual Observations for pygmy blue whales prior to station holding on DP (daytime).	Underwater sound radiated from vessels is primarily generated by propeller and thruster cavitation; sound levels are typically highest when using propulsion systems to maintain position. As described above, the DP system on a MODU or vessel holding station is a critical safety device, and powering down or shutting down is not considered a practicable sound mitigation measure. However, using a pre start-up visual observation period prior to commencing activities requiring DP to hold station, may assist in reducing the risk of eliciting a behavioural response and disrupting an opportunistic foraging event to pygmy blue whales that may already be in the vicinity. CAPL does note that observational evidence from recent CAPL installation campaigns for the J-IC Project indicate that pygmy blue whales appear undisturbed within close proximity to installation vessels operating on DP. The whales were observed to exhibit normal behaviour (e.g. diving, breaching, swimming) including continuing to forage and feed. However, in acknowledgement of Action A.2.3 of the Conservation Management Plan for the Blue Whale (Ref. 52), this control measure has been proposed to potentially assist in mitigating the risk of disrupting opportunistic foraging. Before commencing activities that require holding station on DP: • MODU/vessel bridge-watch crew will undertake 30 minutes of Pre Start-up Visual Observations • station holding activities can commence if no whale has been observed within the Predicted Behavioural Effect Zone during the observation period. See also Section 10.4 for related action flow charts and zone definitions for the different vessel types and activities. Note: The visible distance to the horizon varies based on observer height and weather conditions. If the defined Potential Behavioural Effect Zone distances are not visible, then observations are to extend to the field-of-view of the bridge-watch.	No additional personnel costs. The detection of pygmy blue whales may lead to increased activity duration and overall costs due to delayed start-ups. However, the environmental benefit of reducing potential impacts to pygmy blue whales is considered to outweigh the operational and financial costs from not implementing this control. Therefore, control measure has been adopted for use.

Control measure	Benefit	Cost
CM-20b: Pre Start-up Visual Observations for pygmy blue whales prior to station holding on DP (nighttime)	Implementation of a Pre Start-up Visual Observation period for pygmy blue whales during nighttime operations may afford similar protection from potential impacts from underwater sound emitted by vessels as daytime operations providing the whales can be detected. Technology (e.g. night vision camera or binoculars) will be used to support Pre-Start-up Visual Observations at nighttime, noting that the performance of any technology may have operational limits (range, field-of-view, etc.). Further, as noted above, the observational evidence from daytime operations during recent J-IC installation campaigns do not indicate any disturbance to pygmy blue whale activities due to vessels operating on DP.	The detection of pygmy blue whales during nighttime is likely to be challenging even with the assistance of technology. There will be some small additional costs associated with any technology (night vision camera/binoculars) to support observations. As with daytime operations, the detection of pygmy blue whales during nighttime operations may lead to increased activity duration and overall costs due to delayed start-ups. However, while this control measure is likely to provide only limited environmental benefit, it is considered to outweigh the operational and financial costs from not implementing this control. Therefore, control measure has been adopted for use.
Pre Start-up Visual Observations for other whale species	While the PMST report and CAPL soundscape monitoring do indicate the potential presence of other threatened and/or migratory whale species within the vicinity of the OA, there are no known BIAs, HCTS, or aggregation areas for other whale species that intersect with the OA. The closest BIA is a migration BIA for the humpback whale, ~48 km from the OA. Further, where conservation advices do exist for these species (i.e. fin and sei whales), no management actions relating to underwater sound have been identified. All three of these species (humpback, fin, and sei) are also capital breeders, and are not expected to feed while migrating. The presence of other whale species is expected to be of a transitory nature, and at lower abundance levels (compared to pygmy blue whales given the location of the OA within a migration BIA). While pre start-up observations may reduce the likelihood of exposure of other whale species to underwater sound at levels that may elicit a behavioural response, the energetic cost of this behavioural disturbance is considered minimal (see Section 8.6.4.1.2). As such the environmental benefit of an observation period for other whale species is considered of negligible environmental benefit and would not significantly reduce the residual risk. No further evaluation has been undertaken.	N/A

Control measure	Benefit	Cost
Use of Dedicated Marine Fauna Observers (MFOs).	The use of Dedicated MFOs may increase the visual detection of cetaceans present within proximity to the MODU and/or PSVs. Being able to better locate cetaceans may assist in reducing the risk of behavioural disturbance. However, while the use of Dedicated MFOs may increase visual detection of cetaceans, the use of Dedicated MFOs during the G&E drilling campaign (~12–18 months) is considered to be of limited environmental benefit given there are no additional control measures for the MODU (e.g. no acoustic reduction control to reduce minimum power generation requirements on a MODU) during routine drilling operations and limited control measures (e.g. divert or delay operations) for vessels. As such there is no reduction in residual risk that would be realised from having Dedicated MFOs onboard the MODU and/or vessels during the G&E drilling campaign.	Costs for engaging a Dedicated MFO are expected to be in the order of ~$1,200 per day per person. For an ~12–18 month campaign, this would result in up to ~$1,315,000 in additional personnel costs (allowing for two MFOs on the MODU for 18 months). Given the negligible environmental benefit, this financial cost is considered grossly disproportionate and as such this control has not been adopted for use.
CM-21: Communication Protocol	As identified in Section 8.6.3 there is the potential for multiple CAPL petroleum activities to be occurring at the same time. In the event that concurrent activities are occurring within proximity of each other, a Communications Protocol will be implemented to share pygmy blue whale sighting information (e.g. observed location and behaviour [if detected]) between the activities to assist in providing broader situational awareness.	No additional personnel costs. The sharing of pygmy blue whale sightings data will better inform situational awareness for concurrent petroleum activities occurring within proximity of each other. Therefore, control measure has been adopted for use.

8.6.4.3 ALARP justification

Offshore drilling and vessel operations are commonplace and well-practised nationally and internationally. The potential impacts and risks associated with underwater sound emissions from these types of activities are managed through control measures aligned with applicable legislation and/or recognised as standard industry practice. These requirements are well understood and implemented by the petroleum industry, including by CAPL.

During relevant persons consultation, no objections or claims were raised regarding underwater sound emissions arising from the petroleum activity.

Underwater sound modelling has been used to inform the spatial extent of ensonified areas at different effect criteria, and this is considered an appropriate basis to inform environmental impact and risk assessments.

Based on the environmental impact and risk evaluation and application of relevant assessment tools as commensurate with the predicted level of impact and risk (e.g. higher-order impacts and risks), CAPL considers the adopted good practice

and additional control measures (Section 8.6.4.2) are appropriate to manage the potential impacts and risks from non-impulsive underwater sound emissions. No further reasonably practicable control measures were identified that would provide a meaningful reduction in environmental impact or risk without incurring grossly disproportionate costs. CAPL also considers that the control measures that have been identified and evaluated are aligned with the adaptive management framework for pygmy blue whales within the Backfill Fields Development OPP (Ref. 3). Accordingly, CAPL considers the potential environmental impacts and risks associated with this aspect to be reduced to ALARP.

8.6.4.4 Likelihood and risk level summary

Due to the nature and scale of the petroleum activity within scope of this EP, the deep offshore location of the OA, the overlap between predicted ensonifed areas with BIAs for some fauna, the mobile and transitory nature of marine fauna within the vicinity of the OA, and the application of the above control measures, CAPL has assessed the likelihood and residual risk as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential change in behaviour of marine fauna:			
Marine mammals	Minor (5)	Unlikely (4)	Low (8)
Marine reptiles	Incidental (6)	Rare (6)	Very Low (10)
Fishes, including sharks and rays	Incidental (6)	Rare (6)	Very Low (10)
Potential auditory impairment or injury to marine fauna:			
Marine mammals	Minor (5)	Rare (6)	Very Low (10)
Marine reptiles	Incidental (6)	Rare (6)	Very Low (10)
Fishes, including sharks and rays	Incidental (6)	Rare (6)	Very Low (10)

8.6.5 Demonstration of acceptability

Table 8-30 describes the demonstration of acceptability relevant to this aspect.

Table 8-30: Demonstration of acceptability for planned emissions—underwater sound (non-impulsive)

Comparison with acceptable level(s)
Acceptable levels AL-12, AL-13, AL-14, and AL-15 are applicable to underwater sound emissions from the petroleum activity (refer to Section 6.7). As described in the impact and risk evaluation (Section 8.6.4), the predicted environmental impact would be localised behavioural disturbances or auditory impairments (masking) to individuals and would not be expected to result in impacts at a population level that prevent their long-term recovery or survival. Therefore, the predicted level of impact for these receptors is better than the acceptable levels (AL-12, AL-14, AL-15). Given the accumulated exposure required, the risk of auditory impairment or injury (TTS, AINJ) to a blue whale from non-impulsive sound was not considered credible. The predicted ensonified areas from non-impulsive sound sources did not extend into BIAs or HCTS of marine turtle species. Therefore, the predicted level of impact is consistent with the acceptable level (AL-13).
Principles of ESD
Precautionary Principle In accordance with Table 6-2, a consequence level of Minor (5) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle*

In accordance with Table 6-2, a consequence level of Minor (5) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required.

Biodiversity Principle

The impacts and risks associated with this aspect include localised and short-term behavioural responses of transient species or temporary auditory impairments, which is not expected to result in effects at a population level that would prevent their long-term recovery or survival. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity.

Relevant environmental legislation and other requirements

Legislation and other requirements considered relevant for this aspect include:

- *EPBC Regulations 2025 – Part 8 Division 8.1 interacting with cetaceans*
- *Conservation Management Plan for the Blue Whale 2015–2025 (*Ref. 52)
- *Conservation Advice Balaenoptera physalus fin whale* (Ref. 282)
- *Conservation Advice Balaenoptera borealis sei whale* (Ref. 283)
- *Conservation Advice for Sousa sahulensis Australian humpback dolphin* (Ref. 284)
- *Conservation Advice for Orcaella heinsohni Australian snubfin dolphin* (Ref. 285)
- *Recovery Plan for Marine Turtles in Australia* (Ref. 291)
- *Conservation advice for the whale shark* (Ref. 292).

CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:

Requirement	Demonstration
EPBC Regulations 2025 – Part 8 Division 8.1 – Interacting with cetaceans Caution and no approach zones for interacting with cetaceans from vessels. Vertical and horizontal distances for helicopter operations.	Requirements of regulation 8.05 and 8.06 for vessels, and 8.07 for aircraft, have been incorporated into the following control measures and EPSs: • vessels under transit or on standby within the OA (**EPS-19**) • helicopters under transit within the OA (**EPS-21**).
Conservation Management Plan for the Blue Whale 2015–2025 Management Action A.2.2: Assessing the effect of anthropogenic noise on blue whale behaviour. Management Action A.2.3: Anthropogenic noise in biologically important areas will be managed such that any blue whale continues to utilise the area without injury, and is not displaced from a foraging area	Section 8.6.4 provides a risk evaluation for anthropogenic underwater sound emissions on blue whales, and control measures have been identified. The risk of TTS or AINJ onset from non-impulsive sound sources within scope of this EP was not considered credible. As such, continued use of the BIA without injury is expected. The predicted ensonified areas from non-impulsive sound sources do not intersect with designated Foraging Areas for the pygmy blue whale; the nearest foraging BIA occurs ~220 km south-west of the OA. Similarly, the predicted ensonified areas from non-impulsive sound sources do not intersect with the 'most important areas' for foraging. As such, displacement from a foraging area is not expected. Therefore, this activity is not considered to be inconsistent with the *Conservation Management Plan for the Blue Whale.* The requirements of Action A.2.3 is also incorporated into **EPO-19**.
Conservation Advice Balaenoptera physalus fin whale No explicit relevant conservation actions	N/A

Conservation Advice Balaenoptera borealis sei whale No explicit relevant conservation actions	N/A
Conservation Advice for Sousa sahulensis Australian humpback dolphin No explicit relevant conservation actions	N/A
Conservation Advice for Orcaella heinsohni Australian snubfin dolphin No explicit relevant conservation actions	N/A
Recovery Plan for Marine Turtles in Australia Management Action A1.5: Manage anthropogenic activities to ensure marine turtles are not displaced from identified HCTS (as per section 3.3 Table 6 of Ref. 291). Management Action A1.6: Manage anthropogenic activities in BIAs to ensure that biologically important behaviour can continue.	The predicted ensonified areas from non-impulsive sound sources did not extend into BIAs or HCTS of marine turtle species. Therefore, the petroleum activity is considered to be consistent with the *Recovery Plan for Marine Turtles in Australia.*
Conservation Advice for whale shark Conservation action: Assess the impacts of offshore installations and associated environmental changes (light spill, chronic noise, changed water temperature, localised nutrient levels) on whale sharks and mitigation options for these impacts	Section 8.6.4 provides a risk assessment and consideration of control measures for underwater sound emissions. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for whale shark*
Internal context	
These management processes or procedures were deemed relevant for this aspect: • Adaptative management framework for pygmy blue whales exposed to underwater sound emissions from the Backfill Fields Development (see Section 10.4 of the OPP: Ref. 3). Control measures related to the above management process/procedure have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.	
External context	
During relevant persons consultation, no objections or claims were raised regarding underwater sound emissions arising from the petroleum activity.	

8.6.6 Environmental performance

Table 8-31 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-31: Environmental performance for planned emissions—underwater sound (non-impulsive)

EPO	Control measure	EPS	MC
EPO-17: Sound emissions from planned petroleum activities will be managed such that EPBC Act listed	**CM-17**: Vessels under transit or on standby within the OA.	**EPS-17**: Vessels under transit[112] or on standby within the OA will implement caution and no approach zones as described in	**MC-17.1:** Induction materials include relevant marine fauna caution and no approach zone requirements.

[112] For safety reasons this control measure is not applied to vessels holding station or with limited manoeuvrability (e.g. during bunkering, etc.) or during emergency situations.

EPO	Control measure	EPS	MC
species continue undertaking biological important behaviours[108]. **EPO-18:** Sound emissions from planned petroleum activities will be managed to prevent TTS or AINJ onset to EPBC Act listed species. **EPO-19:** Any blue whale continues to utilise the biologically important area without injury[109], and is not displaced from a foraging area[110][111].		sections 8.05 and 8.06 of the EPBC Regulations 2025 (Cth): • caution zone (300 m either side of whales; 150 m either side of dolphins)– vessels must operate at ≤6 knots within this zone, maximum of three vessels within zone, and vessels should not enter if a calf is present • no approach zone (300 m to the front and rear of whales and 100 m either side; 300 m for whale calves; 150 m to the front and rear of dolphins and 50 m either side)–vessels should not enter this zone, and should not wait in front of the direction of travel of an animal or pod, or follow directly behind. Note: Caution zones for pygmy blue whales are described in EPS-19.	**MC-17.2:** Training records confirm offshore personnel involved in the petroleum activity have completed the induction. **MC-17.3:** Vessel marine fauna sighting records show if cetacean interaction occurred within caution or approach zones and what mitigation (e.g. divert or slow vessel) measure was implemented.

[108] Where biologically important behaviours are defined as behaviour associated with critical life functions (e.g. reproduction, foraging, migration, and resting) (Ref. 323).

[109] For the purpose of Action A.2.3 from the *Conservation Management Plan for the Blue Whale (*Ref. 52) 'injury to blue whales' is considered both PTS and TTS and any other form of physical harm arising from anthropogenic sources of underwater sound (Ref. 334).

[110] For the purpose of Action A.2.3 from the *Conservation Management Plan for the Blue Whale (*Ref. 52) 'displaced from a foraging area' applies in relation to BIAs (Ref. 334); and these BIAs correspond to 'Foraging Area', 'Possible Foraging Area', and 'Known Foraging Area' as illustrated in Figure 1 of the *Conservation Management Plan for the Blue Whale* (Ref. 52; Ref. 334). There are no Foraging Area BIAs within or adjacent to the OA.

[111] In accordance with Australian Government guidance, activities outside designated Foraging Areas should adopt adaptive management approaches in the event that indicators (e.g. aggregation in a particular area) of whale foraging are evident to ensure that impacts are not unacceptable (e.g. no injury or biologically significant disturbance) (Ref. 334). EPO-17 incorporates foraging as one of the biologically important behaviours of marine fauna.

EPO	Control measure	EPS	MC
	CM-19: Vessels under transit or on standby during within the OA—extended caution zone for pygmy blue whales.	**EPS-19:** Vessels under transit[112] or on standby within the Operational Area will implement an extended caution zone for pygmy blue whales[113] in accordance with Table 10-16.	**MC-19:** Induction materials include relevant pygmy blue whale caution zone requirements. See also **MC-17.2** and **MC-17.3**.
	CM-18: Helicopters under transit within the OA.	**EPS-18**: Helicopters under transit within the Operational Area will operate in alignment with section 8.07 of the EPBC Regulations 2025 (Cth): • not operate at a height lower than 1,650 feet or within a horizontal radius of 500 m for a cetacean • not approach a cetacean from head on.	**MC-18:** Helicopter records show if marine fauna interaction occurred, and what mitigation (e.g. divert) measure was implemented
	CM-20a: Pre Start-up Visual Observations for pygmy blue whales prior to station holding on DP (daytime). **CM-20b**: Pre Start-up Visual Observations for pygmy blue whales prior to station holding on DP (nighttime)	**EPS-20:** Prior to the commencement of activities requiring DP to hold station (e.g. drilling operations, HXT installation, or resupply activities), Pre Start-up Visual Observations for pygmy blue whales will be undertaken by the MODU/vessel bridge-watch crew in accordance with Section 10.4 (Table 10-16 and Figure 10-10). Where Pre Start-up Visual Observations occur at night, technology (e.g. night vision camera/binoculars) will be used to support observations.	**MC-20:** Records demonstrate that Pre Start-up Visual Observations were undertaken prior to MODU/vessels commencing station holding on DP

[113] Where the vessel bridge-watched observation is of a positively identified pygmy blue whale or other unidentified large baleen whale that is considered likely to be a pygmy blue whale. Where species identification is uncertain a precautionary approach is adopted and the whale sighting will be treated as if it were a pygmy blue whale. Note: Vessel bridge-watch crew are provided with marine fauna observer inductions as described in Section 10.2.1.3.

EPO	Control measure	EPS	MC
	CM-21: Communication Protocol	**EPS-21:** Where concurrent CAPL petroleum activities are occurring within proximity[114] of each other, a Communications Protocol will be implemented to share pygmy blue whale[113] sightings data.	**MC-21:** Records confirm the communications protocol was implemented as required.

8.7 Planned emissions—Underwater sound (impulsive)

8.7.1 Source of aspect

Activities identified as having the potential to generate impulsive[115] underwater sound are:

- use of acoustic positiong equipment (e.g. USBL, LBL)
- acoustic survey equipment (SBP) during contingency IMR activities.

8.7.2 Underwater sound modelling

JASCO undertook an estimation study (Ref. 326) to inform the impact and risk assessment associated with impulsive underwater sound emissions from the petroleum activity. The estimation study is based on literature reviews of sound source levels and the application of a spherical spreading loss model.

Effect criteria

The study used the following effect criteria (Table 8-32) which were based on the best and most applicable science available at the time of the modelling:

- un-weighted peak pressure levels (PK) and frequency-weighted SEL_{24h} from the US NMFS (Ref. 329) for the onset of auditory injury (AINJ) and TTS in cetaceans
- un-weighted PK and frequency-weighted SEL_{24h} from the US Navy (Ref. 331) for the onset of AINJ and TTS in marine turtles
- un-weighted SPL from the US NOAA criterion for marine mammal behavioural disruption (Ref. 330)
- un-weighted SPL from McCauley et al. (Ref. 361) for marine turtle behavioural response criterion of 166 dB re 1 µPa and behavioural disturbance of 175 dB re 1 µPa
- sound exposure guidelines for fish, fish eggs and fish larvae from seismic airguns in Popper et al. (Ref. 332).

Research is ongoing into the relationship between sound and its effects on benthic invertebrates, including the relevant metrics for both effect and impact (Ref. 326). Marine invertebrates lack a gas-filled bladder and are unable to detect

[114] Where proximity refers to the Potential Behavioural Effect Zone for pygmy blue whales as defined in Table 10-16.

[115] Impulsive sounds are typically transient, brief (less than one second), broadband, and consist of high peak sound pressure with rapid rise and rapid decay times (Ref. 329; Ref. 372).

the pressure component of sound waves (Ref. 362; Ref. 363) or “hear” sound in the way that mammals and fish can. Available literature suggests particle motion, rather than sound pressure, is a more important factor for crustacean and bivalve hearing (Ref. 326). Peak-peak pressure levels (PK-PK) and particle acceleration (ms^{-2}) at the seafloor were used to help assess effects of sound on benthic invertebrates. A PK-PK of 202 dB re 1 µPa is considered a no effect sound level (Ref. 364), and PK-PK of 209–213 dB re 1 µPa (Ref. 365; Ref. 366; Ref. 367; Ref. 368) for sound levels related to different levels of potential impairment.

Table 8-32: Effect criteria for impulsive sound for different types of impacts and species groups

Receptor	Mortality and potential mortal injury	Recoverable injury[116]	AINJ onset	TTS onset[116]	Masking[116]	Behaviour[116]
Low frequency cetaceans	N/A	N/A	SEL_{24h}: 183 dB re 1 μPa^2s PK: 222 dB re 1 µPa	SEL_{24h}: 168 dB re 1 μPa^2s PK: 216 dB re 1 µPa	N/A	SPL: 160 dB re 1 µPa
High frequency cetaceans	N/A	N/A	SEL_{24h}: 193 dB re 1 μPa^2s PK: 230 dB re 1 µPa	SEL_{24h}: 178 dB re 1 μPa^2s PK: 224 dB re 1 µPa	N/A	
Very high frequency cetacean	N/A	N/A	SEL_{24h}: 159 dB re 1 μPa^2s PK: 202 dB re 1 µPa	SEL_{24h}: 144 dB re 1 μPa^2s PK: 196 dB re 1 µPa	N/A	
Marine turtles	N/A	N/A	SEL_{24h}: 184 dB re 1 μPa^2s PK: 230 dB re 1 µPa	SEL_{24h}: 169 dB re 1 μPa^2s PK: 224 dB re 1 µPa	N/A	SPL: 166 dB re 1 µPa SPL: 175 dB re 1 µPa
Fish—no swim bladder (particle motion detection)[117]	SEL_{24h}: >219 dB re 1 μPa^2s PK: >213 dB re 1 µPa	SEL_{24h}: >216 dB re 1 μPa^2s PK: >213 dB re 1 µPa	N/A	SEL_{24h}: >>186 dB re 1 μPa^2s	(N) Low (I) Low (F) Low	(N) High (I) Moderate (F) Low
Fish—swim bladder not involved in hearing (particle motion detection)	SEL_{24h}: 210 dB re 1 μPa^2s PK: >207 dB re 1 µPa	SEL_{24h}: 203 dB re 1 μPa^2s PK: >207 dB re 1 µPa	N/A	SEL_{24h}: >>186 dB re 1 μPa^2s	(N) Low (I) Low (F) Low	(N) High (I) Moderate (F) Low
Fish—swim bladder involved in hearing (primarily pressure detection)	SEL_{24h}: 207 dB re 1 μPa^2s PK: >207 dB re 1 µPa	SEL_{24h}: 203 dB re 1 μPa^2s PK: >207 dB re 1 µPa	N/A	SEL_{24h}: 186 dB re 1 μPa^2s	(N) Low (I) Low (F) Moderate	(N) High (I) High (F) Moderate

[116] Relative risk (high, moderate, low) is given for fauna at three distances from the source (near [N], intermediate [I] and far [F]). Where 'near' is considered to be in the order of tens of meters from the source, 'intermediate' is hundreds of meters, and 'far' in the thousands of meters (Ref. 333).

[117] Also appropriate for sharks.

Receptor	Mortality and potential mortal injury	Recoverable injury[116]	AINJ onset	TTS onset[116]	Masking[116]	Behaviour[116]
Fish eggs and fish larvae	SEL_{24h}: >210 dB re 1 μPa^2s PK: >207 dB re 1 µPa	(N) Moderate (I) Low (F) Low	N/A	(N) Moderate (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low

8.7.2.1 Acoustic positioning equipment

Transponders may be used to accurately position the MODU or track the location of deployed equipment. Transponders emit short pulses of sound; these transmissions are not continuous but consist of short 'chirps' when active and do not emit any sound when on standby. Indicative source levels for acoustic positioning equipment are ~180–204 dB re 1 µPa @ 1 m with operating frequencies of ~7–60 kHz (Ref. 325; Ref. 326; Ref. 369; Ref. 370; Ref. 371).

JASCO undertook spherical spreading modelling for a USBL system with a source level of 204 db re 1 µPa @ 1 m (Ref. 326). The spreading loss modelling indicated the following for marine mammals:

- maximum horizontal distance ~151 m for the marine mammal behavioural response criterion
- PK effect criteria for all marine mammal hearing groups may be exceeded at very short horizontal distances from the sound source; e.g. ~2 m and ~4 m for AINJ and TTS onset in very high frequence cetaceans
- the estimated distance to reach SEL_{24h} effect criteria for AINJ onset were ~69 m, ~94 m, and ~2.4 km for low, high, and very-high frequency cetaceans respectively
- the estimated distance to reach SEL_{24h} effect criteria for TTS onset were ~355 m, ~470 m, and ~4.5 km for low, high, and very-high frequency cetaceans respectively.

The spherical spreading modelling indicated that neither AINJ or TTS onset effect criteria for marine turtles was reached (Ref. 326). JASCO also noted that the sounds produced by the USBL are outside the hearing frequency range for turtles (Ref. 326). As such, any effect to marine turtles from the use of acoustic positioning equipment are not considered further within this impact and risk assessment.

8.7.2.2 Acoustic survey equipment (SBP)

Acoustic survey techniques such as SBP generate impulsive sound emissions; however, these are moderate to high frequency sound emissions which attenuate rapidly in water.

Three types of chirp SBPs and one boomer SBP were modelled by JASCO (Ref. 326). The spreading loss modelling indicated the following for marine mammals:

- chirp SBP
  - maximum horizontal distance ~8–281 m for the marine mammal behavioural response criterion
  - PK effect criteria for all marine mammal hearing groups may be exceeded at very short horizontal distances from the SPB sources; e.g. ~4 m and ~8 m for AINJ and TTS onset in very high frequence cetaceans
  - for the lower-powered systems (source levels 178–179 db re 1 µPa @ 1 m) SEL_{24h} effect criteria for AINJ or TTS onset were not reached, except for TTS onset for very high frequency cetaceans at distances of ~48–97 m
  - for the higher-powered system (source level 209 db re 1 µPa @ 1 m) SEL_{24h} effect criteria for AINJ onset were ~66 m, 6 m, and ~2.0 km for low,

high, and very high frequency cetaceans respectively; and for TTS onset were ~1.7 km, ~196 m, and ~7.7 km for low, high, and very high frequency cetaceans respectively

- boomer SBP
  - maximum horizontal distance ~178 m for the marine mammal behavioural response criterion
  - PK effect criteria for all marine mammal hearing groups may be exceeded at very short horizontal distances from the SPB source; e.g. ~3 m and ~6 m for AINJ and TTS onset in very high frequence cetaceans
  - SEL_{24h} effect criteria for AINJ onset were not reached for low or high frequency cetaceans; and for very high frequency cetaceans the estimated distance to effect criteria was ~17 m
  - the estimated distance to reach SEL_{24h} effect criteria for TTS onset were ~24 m, ~2 m, and ~513m for low, high, and very-high frequency cetaceans respectively.

The spherical spreading modelling indicated that neither AINJ or TTS onset effect criteria for marine turtles was reached (Ref. 326). JASCO also noted that acoustic survey equipment would not result in physiological impacts to marine turtles located within metres of the sources because the sounds produced by the SBP are outside the hearing frequency range for turtles (Ref. 326).

JASCO's assessment also noted that based on comparison to the available Popper et al. (Ref. 332) criteria, the acoustic survey equipment considered could result in physiological impacts to fish located within metres of the sources, however, the likelihood of this occurring was considered remote (Ref. 326).

PK-PK effect criteria as relevant to benthic invertebrates may be exceeded but only within very close proximity to the acoustic sources; and given the general positioning of equipment (e.g. hull mounted from vessel, or several tens of metres from the seafloor on ROV/AUVs) it is unlikely that PK-PK effect criteria would be exceeded at the seafloor (Ref. 326).

As such, any effect to marine turtles, fish, or benthic invertebrates from the use of SBP are not considered further within this impact and risk assessment.

8.7.3 Concurrent petroleum activities

Section 5.4.6 identifies CAPL and other operator petroleum activities that may be occurring within the vicinity of the OA during the indicative schedule for the G&E drilling activities. Other petroleum activities that may result in impulsive underwater sound emissions include:

- vessel-based activities during the proposed Pluto 4D marine seismic survey (Woodside).

The Pluto OA is only ~20 m from the G&E OA; however, the active source and acquisition areas (i.e. where impulsive sound emissions will occur) are >11 km from the G&E OA. As such, the potential ensonified areas from the two activities (G&E and Pluto seismic) are unlikely to overlap. In addition, the sources of impulsive sound associated the G&E petroleum activity are temporary, with durations varying in the order of milli-seconds (e.g. from transponders) that may be in use intermittently over the duration of the drilling campaign (~12–18 months); up to days or weeks (e.g. from SBP equipment during any contingency IMR activities).

Given the types of impulsive sound sources and their spatial separation, any risks associated with concurrent activities are not considered further within this impact and risk assessment.

8.7.4 Impact and risk evaluation

Impulsive underwater sound emissions may result in a:

- localised and temporary change in ambient underwater sound.

A localised and temporary change in ambient underwater sound may result in a:

- potential change to behaviour in marine fauna
- potential auditory impairment or injury to marine fauna.

8.7.4.1 Consequence evaluation

8.7.4.1.1 Impact: Localised and temporary change in ambient underwater sound

Impulsive underwater sound emissions from the petroleum activity will locally and temporarily increase underwater sound levels from ambient levels. The sources of impulsive sound associated the petroleum activity are temporary, with durations varying in the order of milli-seconds (e.g. from transponders) that may be in use intermittently over the duration of the drilling campaign (~12–18 months); up to days or weeks (e.g. from SBP equipment during any contingency IMR activities).

Acoustic modelling determined that the distances to most effect criteria were small (e.g. metres to hundreds of metres); however, depending on the equipment type and power the exposure above effect criteria for very high frequency cetaceans may extend kilometres from the source (Section 8.7.2).

The consequence of causing a localised and temporary change in ambient underwater sound from impulsive sound sources has been assessed as Incidental (6) and the soundscape will return to ambient levels upon completion of the activity.

8.7.4.1.2 Risk: Potential change to behaviour in marine fauna

Marine mammals

A spreading loss model was used to estimate sound propagation from acoustic positioning and survey (SBP) equipment (Section 8.7.2). This modelling indicated the maximum horizontal distance over which the marine mammal behavioural response effect criteria may be reached is ~151 m from acoustic position equipment or up to ~281 m from SBP survey equipment.

As identified in Section 5.3.3.1, several cetacean species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. The threatened and/or migratory cetaceans that may be present within the OA are predominantly low and high frequency cetaceans. Very high frequency cetaceans were also identified within the PMST report as species or species habitat that may occur within the OA; however, these species are not listed as threatened and/or migratory under the EPBC Act.

The predicted ensonified area above the behavioural effect criteria for marine mammals also interests with the migration BIA for pygmy blue whales. The presence of pygmy blue whales within the Jansz region has been recorded from late-March to mid-September (peak late-May to June) during northern migration,

and during early-October to late-January (peak late-November and early-December) for the southern migration (Section 5.3.3.1.1; Table 5-17).

Except for pygmy blue whales, there are no other known BIAs, HCTS of the species, or aggregation areas for other cetacean species that intersect with the OA; as such, it is expected that any presence of cetacean species would be of a transitory nature.

Given the largest predicted R_{max} of ~281 m, the energetic cost of avoiding the sound source is small in the context of the greater migratory and/or transitory movements (e.g. several thousands of kilometres) of the cetacean species, including pygmy blue whales, that may be present within the vicinity of the OA.

The worst-case consequence of impulsive sound resulting in a change in the behaviour of a small number of migratory or transitory marine mammals and then subsequently causing a reduction in fitness due to deviations in migratory or transitory path, has been assessed as Incidental (6).

8.7.4.1.3 Risk: Potential auditory impairment or injury to marine fauna

Marine mammals

Impulsive underwater sound may cause auditory impairment (e.g. TTS, masking) or auditory injury (e.g. AINJ) to marine mammals. TTS is considered to be a recoverable impairment, with 24 hours thought to be sufficient for recovery to occur (Ref. 329; Ref. 343). However, with respect to pygmy blue whales, guidance from the Australian Government has defined both TTS and PTS as an auditory injury (Ref. 334).

Auditory masking may occur when there is a reduction in audibility for one sound (signal) caused by the presence of another sound (noise), impeding the ability of an animal to perceive a signal (Ref. 344, Ref. 345). For this to occur, the noise must be loud enough and have a similar frequency to the signal, and both signal and noise must occur at the same time. Masking and the potential effects of masking on communication and listening space of marine mammals are not fully understood and remain an area of active research (Ref. 346, Ref. 347, Ref. 348, Ref. 349; Ref. 351). Currently, there are no specific received level thresholds for reliably assessing or regulating masking responses to underwater sound (Ref. 350). The distance at which masking may occur is related to multiple factors, including signal and sound source characteristics, the location of signal, source, and receiver, and the spectral and temporal variation in acoustic propagation (Ref. 345). Some cetaceans might respond acoustically to underwater sound in a range of ways, including by increasing the amplitude of their calls (Lombard effect), changing their spectral (frequency content) or temporal vocalisation properties, and in some cases, cease vocalising (Ref. 352, Ref. 353, Ref. 354, Ref. 355, Ref. 356). Given the source spectra of the SBP would overlap with the hearing frequency ranges of some marine mammals that may be transiting through the OA, it is possible that some temporary masking of calls may occur.

A spreading loss model was used to estimate sound propagation from acoustic positioning and survey (SBP) equipment (Section 8.7.2). The PK effect criteria for all marine mammal hearing groups may be exceeded at very short horizontal distances from the sources; e.g. ~2 m and ~4 m for AINJ and TTS onset respectively in very high frequence cetaceans from acoustic positioning equipment, and up to ~4 m and ~8 m from SBP equipment. Therefore, the risk of AINJ or TTS onset from instantaneous exposure to an impulsive sound source is not considered credible and no further evaluation is presented.

The estimated horizontal distances to accumulated SEL_{24h} AINJ and TTS onset effect criteria from acoustic positioning survey equipment was ~69 m, ~94 m, and ~2.4 km, and ~355 m, ~470 m, and ~4.5 km for low, high, and very-high frequency cetaceans respectively (Section 8.7.2.1). Given that the AINJ onset effect is an accumulated exposure metric, the intermittent signals from transponders, and that if present within the OA cetacean species are expected to be transitory, the risk of AINJ or TTS from these types of emissions sources is not considered credible and no further evaluation is presented.

The estimated horizontal distances to accumulated SEL_{24h} AINJ and TTS onset effect criteria varied depending on the type and power of SBP equipment. Estimated distances to AINJ onset effect criteria for low, high, and very-high frequency cetaceans were up to ~66 m, ~6 m, and ~2.0 km for higher-powered SBP equipment respectively. Note: This AINJ effect criteria was not reached for all SBP equipment modelled (Section 8.7.2.2). Estimated distances to TTS onset effect criteria for low, high, and very-high frequency cetaceans were up to ~1.7 km, ~196 m, and ~7.7 km for from higher-powered SBP equipment respectively.

Given that the AINJ onset effect is an accumulated exposure metric, and that the predicted distances are small (<100 m) for low and high frequency cetaceans, and that if present within the OA these species are expected to be transitory, the risk of AINJ is not considered credible and no further evaluation is presented.

Swim speeds for very high frequency cetaceans are not publicly available; therefore using swim speeds of pygmy blue whales as a proxy, the duration a transient cetacean is expected to remain in within the AINJ ensonified area from SBP survey equipment (R_{max} of ~2.0 km) would be ~0.8–1.7 hours; i.e. substantially less than the 24 hours exposure at this received level required for AINJ onset to occur. Similarly, the duration a transient cetacean is expected to remain in within the TTS ensonified area from SBP survey equipment (R_{max} of ~7.7 km) would be ~3.1–6.4 hours; i.e. substantially less than the 24 hours exposure within this SEL_{24h} ensonified area required for TTS onset to occur. Additionally, the SBP is not a stationary sound source during surveys, but would be moving.

Given the accumulated exposure required before AINJ or TTS onset may occur, the moving nature of the SBP sound source, and the mobile and transient nature of cetaceans within the vicinity of the OA, the risk of AINJ or TTS is not considered credible from acoustic survey (SBP) equipment, and has not been evaluated further.

As described above, given the source spectra of the SBP would overlap with the hearing frequency ranges of some marine mammals that may be transiting through the OA, it is possible that some temporary masking of calls may occur. The worst-case consequence of impulsive sound resulting in localised masking effects to a small number of transitory marine mammals and then subsequently causing a reduction in fitness, has been assessed as Incidental (6).

8.7.4.2 Control measures

Table 8-33 and Table 8-34 describe the control measures relevant to this aspect.

Table 8-33: Good practice control measures for planned emissions—underwater sound (impulsive)

Good practice control measures	
Control measure	**Description**
CM-22a: Pre start-up visual observation for SBP surveys (daytime)	During daylight hours, visual observations for the presence of whales should be undertaken by a member of the vessel bridge-watch crew for at least 30 minutes before the commencement of any SBP acoustic survey. See Section 10.4 and Figure 10-11 for related action flow charts and zone definitions. This control is aligned with the intent of the pre-start up visual observations required under EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales (noting that this Policy itself is not applicable to the use of SBP equipment).

Table 8-34: Additional control measures evaluated for planned emissions—underwater sound (impulsive)

Control measure	Benefit	Cost
CM-22b: Pre start-up visual observation for SBP surveys (nighttime)	Implementation of a Pre Start-up Visual Observation period for whales during nighttime operations may afford similar protection from potential impacts from underwater sound emitted by SBPs as daytime operations providing the whales can be detected. Technology (e.g. night vision camera or binoculars) will be used to support Pre-Start-up Visual Observations at nighttime, noting that the performance of any technology may have operational limits (range, field-of-view, etc.).	The detection of whales during nighttime is likely to be challenging even with the assistance of technology. There will be some small additional costs associated with any technology (night vision camera/binoculars) to support observations. As with daytime operations, the detection of whales during nighttime operations may lead to increased survey duration and overall costs due to delayed start-ups. However, while this control measure is likely to provide only limited environmental benefit, it is considered to outweigh the operational and financial costs from not implementing this control. Therefore, control measure has been adopted for use.
Implement a shut-down zone around SBP	Based on the predicted distances from an SBP source to PK effect criteria, instantaneous AINJ to marine mammals was not considered credible (Section 8.7.2.2 and 8.7.4.1.3). The potential for accumulated sound exposure (SEL_{24h}) from an SBP source to result in the onset of AINJ was also not considered credible given both the mobile sound source during the survey and the mobile nature of the receiver (i.e. migrating or transiting whales). Therefore, the use of a shut-down zone during SBP surveys is considered to provide no environmental benefit or risk reduction. No further evaluation has been undertaken.	N/A

8.7.4.3 ALARP justification

Use of acoustic positioning and survey equipment to support offshore petroleum activities are commonplace and well-practised nationally and internationally. The potential impacts and risks associated with underwater sound emissions from

these types of activities are managed through control measures aligned with applicable guidelines and/or recognised as standard industry practice. These requirements are well understood and implemented by the petroleum industry, including by CAPL.

During relevant persons consultation, no objections or claims were raised regarding underwater sound emissions arising from the petroleum activity.

Based on the environmental impact and risk evaluation and application of relevant assessment tools as commensurate with the predicted level of impact and risk (e.g. higher-order impacts and risks), CAPL considers the adopted good practice and additional control measures (Section 8.7.4.2) are appropriate to manage the potential impacts and risks from impulsive underwater sound emissions. No further reasonably practicable control measures were identified that would provide a meaningful reduction in environmental impact or risk without incurring grossly disproportionate costs. CAPL also considers that the control measures that have been identified and evaluated are aligned with the adaptive management framework for pygmy blue whales within the Backfill Fields Development OPP (Ref. 3). Accordingly, CAPL considers the potential environmental impacts and risks associated with this aspect to be reduced to ALARP.

8.7.4.4 Likelihood and risk level summary

Due to the nature and scale of the petroleum activity within scope of this EP, the intermittent and/or short duration of impulsive sound emissions, the deep offshore location of the OA, the mobile and transitory nature of marine fauna within the vicinity of the OA, and the application of the above control measures, CAPL has assessed the likelihood and residual risk as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential change in behaviour of marine fauna:			
Marine mammals	Incidental (6)	Rare (6)	Very Low (10)
Potential auditory impairment or injury to marine fauna:			
Marine mammals	Incidental (6)	Rare (6)	Very Low (10)

8.7.5 Demonstration of acceptability

Table 8-35 describes the demonstration of acceptability relevant to this aspect.

Table 8-35: Demonstration of acceptability for planned emissions—underwater sound (impulsive)

Comparison with acceptable level(s)
Acceptable levels AL-12, AL-13, AL-14, and AL-15 are applicable to underwater sound emissions from the petroleum activity (refer to Section 6.7). As described in the impact and risk evaluation (Section 8.7.3), the predicted environmental impact would be highly localised behavioural disturbances or auditory impairments (masking) to individuals and would not be expected to result in impacts at a population level that prevent their long-term recovery or survival. Therefore, the predicted level of impact for these receptors is better than the acceptable levels (AL-12, AL-14, AL-15). Given the accumulated exposure required, the risk of auditory impairment (TTS, AINJ) to a blue whale from impulsive sound was not considered credible. The predicted ensonified areas from impulsive sound sources did not extend into BIAs or HCTS of marine turtle species. Therefore, the predicted level of impact is consistent with the acceptable level (AL-13).

Principles of ESD

Precautionary Principle

In accordance with Table 6-2, a consequence level of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required.

Intergenerational Principle

In accordance with Table 6-2, a consequence level of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required.

Biodiversity Principle

The impacts and risks associated with this aspect include highly localised behavioural disturbances or auditory impairments (masking) to individuals, which is not expected to result in effects at a population level that would prevent their long-term recovery or survival. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity.

Relevant environmental legislation and other requirements

Legislation and other requirements considered relevant for this aspect include:

- *Conservation Management Plan for the Blue Whale 2015–2025* (Ref. 52)
- *Conservation Advice Balaenoptera physalus fin whale* (Ref. 282)
- *Conservation Advice Balaenoptera borealis sei whale* (Ref. 283)
- *Conservation Advice for Sousa sahulensis Australian humpback dolphin* (Ref. 284)
- *Conservation Advice for Orcaella heinsohni Australian snubfin dolphin* (Ref. 285)
- *Recovery Plan for Marine Turtles in Australia* (Ref. 291)
- *Conservation advice for the whale shark* (Ref. 292).

CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:

Requirement	Demonstration
Conservation Management Plan for the Blue Whale 2015–2025 Management Action A.2.2: Assessing the effect of anthropogenic noise on blue whale behaviour. Management Action A.2.3: Anthropogenic noise in biologically important areas will be managed such that any blue whale continues to utilise the area without injury, and is not displaced from a foraging area	Section 8.7.4 provides a risk evaluation for anthropogenic underwater sound emissions on blue whales, and control measures have been identified. The risk of TTS or AINJ onset from impulsive sound sources within scope of this EP was not considered credible. As such, continued use of the BIA without injury is expected. The predicted ensonified areas from impulsive sound sources do not intersect with designated Foraging Areas for the pygmy blue whale; the nearest foraging BIA occurs ~220 km south-west of the OA. Similarly, the predicted ensonified areas from impulsive sound sources do not intersect with the 'most important areas' for foraging. As such, displacement from a foraging area is not expected. Therefore, this activity is not considered to be inconsistent with the *Conservation Management Plan for the Blue Whale.* The requirements of Action A.2.3 is also incorporated into **EPO-19**.
Conservation Advice Balaenoptera physalus fin whale No explicit relevant management actions	N/A
Conservation Advice Balaenoptera borealis sei whale	N/A

No explicit relevant management actions	
Conservation Advice for Sousa sahulensis Australian humpback dolphin No explicit relevant management actions	N/A
Conservation Advice for Orcaella heinsohni Australian snubfin dolphin No explicit relevant management actions	N/A
Recovery Plan for Marine Turtles in Australia Management Action A1.5: Manage anthropogenic activities to ensure marine turtles are not displaced from identified HCTS (as per section 3.3 Table 6 of Ref. 291). Management Action A1.6: Manage anthropogenic activities in BIAs to ensure that biologically important behaviour can continue	The predicted ensonified areas from impulsive sound sources did not extend into BIAs or HCTS of marine turtle species. Therefore, the petroleum activity is not considered to be inconsistent with the *Recovery Plan for Marine Turtles in Australia.*
Conservation Advice for whale shark Conservation action: Assess the impacts of offshore installations and associated environmental changes (light spill, chronic noise, changed water temperature, localised nutrient levels) on whale sharks and mitigation options for these impacts	Section 8.7.4 provides a risk assessment and consideration of control measures for underwater sound emissions. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for whale shark*
Internal context	
No management processes or procedures were deemed relevant for this aspect.	
External context	
During relevant persons consultation, no objections or claims were raised regarding underwater sound emissions arising from the petroleum activity.	

8.7.6 Environmental performance

Table 8-36 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-36: Environmental performance for planned emissions—underwater sound (impulsive)

EPO	Control measure	EPS	MC
EPO-17: Sound emissions from planned petroleum activities will be managed such that EPBC Act listed species continue undertaking biological important behaviours[118]. **EPO-18**: Sound emissions from planned petroleum activities will be managed to prevent TTS or AUD-INJ	**CM-22a**: Pre start-up visual observation for SBP surveys (daytime). **CM-22b**: Pre start-up visual observation for SBP surveys (nighttime).	**EPS-22**: Prior to the commencement of a SBP acoustic survey Pre Start-up Visual Observations for whales will be undertaken by the vessel bridge-watch crew in accordance with Section 10.5 and Figure 10-11. Where Pre Start-up Visual Observations occur at night, technology (e.g. night vision camera/binoculars)	**MC-22:** Records demonstrate that Pre Start-up Visual Observations were undertaken prior to the commencement of any SBP survey.

[118] Where biologically important behaviours are defined as behaviour associated with critical life functions (e.g. reproduction, foraging, migration, and resting) (Ref. 323).

EPO	Control measure	EPS	MC
onset to EPBC Act listed species. **EPO-19:** Any blue whale continues to utilise the biologically important area without injury[119], and is not displaced from a foraging area[120][121].		will be used to support observations.	

8.8 Planned discharges—MODU and vessel discharges

8.8.1 Source of aspect

Activities identified as having the potential to result in planned discharges from the MODU and vessels include:

- MODU and vessels operations within the OA during the petroleum activity.

8.8.2 Environmental impact and risk evaluation

Planned discharges from MODU and vessels may result in a:

- localised and temporary change in water quality.

A localised and temporary change in water quality may result in:

- potential change in behaviour of marine fauna.

8.8.2.1 Consequence evaluation

Section 8.6.2 of the NOPSEMA-accepted Gorgon Backfill Fields Development OPP provides an evaluation of potential impacts from planned discharges from the MODU and vessels. As this petroleum activity forms part of the Backfill Fields Development (the offshore project), the planned MODU/vessels discharges are of a similar (or smaller) nature and scale, and the relevant receptors are the same as those previously assessed, the consequence evaluation for this EP is considered covered by consequence evaluation within Section 8.6.2 of the OPP[122]. In accordance with regulation 56(1) of the OPGGS(E)R, as this information has been previously supplied and is publicly available[123] it is not repeated here.

[119] For the purpose of Action A.2.3 from the *Conservation Management Plan for the Blue Whale* (Ref. 52) 'injury to blue whales' is considered both PTS and TTS and any other form of physical harm arising from anthropogenic sources of underwater sound (Ref. 334).

[120] For the purpose of Action A.2.3 from the *Conservation Management Plan for the Blue Whale* (Ref. 52) 'displaced from a foraging area' applies in relation to BIAs (Ref. 334); and these BIAs correspond to 'Foraging Area', 'Possible Foraging Area', and 'Known Foraging Area' as illustrated in Figure 1 of the *Conservation Management Plan for the Blue Whale* (Ref. 52; Ref. 334). There are no Foraging Area BIAs within or adjacent to the OA.

[121] In accordance with Australian Government guidance, activities outside designated Foraging Areas should adopt adaptive management approaches in the event that indicators (e.g. aggregation in a particular area) of whale foraging are evident to ensure that impacts are not unacceptable (e.g. no injury or biologically significant disturbance) (Ref. 334). EPO-17 incorporates foraging as one of the biologically important behaviours of marine fauna.

[122] This risk is described as changes to predator–prey dynamics in the OPP.

[123] The NOPSEMA-accepted Gorgon Backfill Fields Development OPP is available online at: https://docs.nopsema.gov.au/A1265361. Section 8.6.2 of the Gorgon Backfill Fields Development OPP provides the consequence evaluation of the potential impacts from planned discharges from the MODU and vessels.

The consequence evaluation for both a localised and temporary change in water quality and a potential change in behaviour of marine fauna have been assessed as Incidental (6).

8.8.2.2 Control measures

Table 8-37 describes the good practice control measures relevant to this aspect.

Table 8-37: Good practice control measures relevant to planned discharges—MODU and vessel discharges

Control measure	Description
CM-23: MARPOL 73/78	Prior to commencement of the petroleum activity, Chevron's OVIS assessment requirements within the *Chevron Shipping's Marine Standard Non Tankers: Corporate OE Standard* (Ref. 180) are used to verify that all vessels will comply with relevant Marine Orders (as appropriate to vessel class) for discharges, including: • Marine Order 91—Marine pollution prevention—oil, which gives effect to MARPOL 73/78 Annex I and the conditions under which oily bilge is authorized to be discharged to the environment • Marine Order 95—Marine pollution prevention—garbage, which gives effect to MARPOL 73/78 Annex V and the conditions under which macerated and unmacerated food waste can be discharged to the environment • Marine Order 96—Marine Pollution Prevention—sewage, which gives effect to MARPOL 73/78 Annex IV and the conditions under which sewage can be discharged to the environment. MARPOL is the International Convention for the Prevention of Pollution from Ships and is aimed at preventing both accidental pollution and pollution from routine operations
CM-24: Fire extinguishing media	Marine Order 15— Construction—Fire protection, fire detection and fire extinction sets out requirements for the construction and equipping of vessels to reduce fire risks. It gives effect to Chapter II-2 of the International Convention for the Safety of Life at Sea (SOLAS)
CM-25: Hazardous materials selection process	Planned discharges to the marine environment are subject to selection and environmental assessment as per CAPL's *Hazardous Materials Management Procedure* (Ref. 181). The environmental assessment process: • identifies the Chemical Hazard and Risk Management (CHARM) colour banding or the OCNS group for non-CHARM products • evaluates the dosage, quantity, and frequency of the discharge, and the location and nature of the receiving environment • requires the selection of the least hazardous material where technically and operationally feasible

Table 8-38: Additional control measures evaluated for planned discharges—MODU and vessel discharges

Control measure	Benefit	Cost
Storage, transport, and disposal of sewage, greywater, putrescible and bilge wastes onshore.	The storage, transport, and disposal or sewage, greywater, putrescible and bilge wastes onshore would avoid these types of discharges being released to the environment. However, as described in the impact and risk evaluation, the consequence associated with these types of intermittent discharges is considered localised and temporary	The implementation of this control would introduce new safety and health risks, environmental risks, and increased costs (e.g. from the storage of wastes onboard, requirement for appropriate storage facilities, additional vessels for transfers, onshore treatment and/or disposal, etc.).

Control measure	Benefit	Cost
	with a very low residual risk to marine fauna. It is also noted that these types of discharges are permitted and managed under existing legislation.	Therefore, the cost of implementing this control is considered grossly disproportionate to the limited environmental benefit (and no change in residual risk) it may provide for marine fauna in an offshore open ocean environment. Therefore, this control measure has not been adopted for use.

8.8.2.3 ALARP justification

Offshore MODU and vessel operations, and subsequent planned discharges, are commonplace and well-practised nationally, and internationally. The control measures to manage the impacts and risks associated with these planned discharges are well defined via legislative requirements that are considered standard industry practice. These are well understood and implemented by the petroleum industry and CAPL.

During relevant persons consultation, no objections or claims were raised regarding these discharges arising from the petroleum activity.

Based on the environmental impact and risk evaluation and application of relevant assessment tools as commensurate with the predicted level of impact and risk (e.g. lower-order impacts and risks), CAPL considers the adopted good practice control measures (Section 8.8.2.2) are appropriate to manage the potential impacts and risks from planned discharges from vessel operations. No further reasonably practicable control measures were identified that would provide a meaningful reduction in environmental impact or risk without incurring grossly disproportionate costs. Accordingly, CAPL considers the potential environmental impacts and risks associated with this aspect to be reduced to ALARP.

8.8.2.4 Likelihood and risk level summary

Given the nature and scale of this activity with standard control measures in place, CAPL considers the likelihood and residual risk as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential change in behaviour of marine fauna			
Marine fauna	Incidental (6)	Rare (6)	Very Low (10)

8.8.3 Demonstration of acceptability

Table 8-39 describes the demonstration of acceptability relevant to this aspect.

Table 8-39: Demonstration of acceptability relevant to planned discharges—MODU and vessel discharges

Comparison with acceptable level
Acceptable levels AL-01, AL-12, AL-13, AL-14 and AL-15 are applicable to planned discharges from MODU and vessels associated with the petroleum activity (refer to Section 6.7). Changes to water quality are predicted to be incidental with localised and temporary impacts that return to ambient levels following the cessation of the discharge. These impacts will not have lasting effect on biodiversity and ecosystem integrity. Therefore, the predicted level of impact will be managed to be equivalent or better than the acceptable levels AL-01. Potential impacts to marine fauna from a potential change to marine fauna behaviour were also predicted to be localised to the immediate vicinity of the discharge and short-term. The predicted

impacts would not decrease the availability or quality of important habitat, result in impacts at population level that would prevent long-term recovery or survival or have lasting effects on ecosystem integrity. As such, the predicted level of impact will be managed to be equivalent or better than the acceptable levels AL-12, AL-13, AL-14 and AL-15.

Principles of ESD

Precautionary Principle

In accordance with Table 6-2, consequence levels ranging of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required.

Intergenerational Principle

In accordance with Table 6-2, consequence levels ranging of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required.

Biodiversity Principle

The impacts and risks associated with this aspect include localised and short-term change in behaviour of transitory marine fauna, which is not expected to result in effects at a population level that would prevent their long-term recovery or survival. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity

Relevant environmental legislation and other requirements

Legislation and other requirements considered relevant for this aspect include:

- *Marine Order 91*
- *Marine Order 95*
- *Marine Order 96*
- *Marine Order 15*
- *MARPOL 73/78 Annex I, IV and V*
- *Industrial Chemicals Environmental Management Standard* – (IChEMS)
- *National Recovery Plan for albatrosses and petrels* (2022) (Ref. 304).

CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:

Requirement	Demonstration
Marine Order 91 Gives effect to Annex I of MARPOL 73/78	Requirements for offshore discharge of oily bilge water from MODU and vessels have been incorporated into the **MARPOL 73/78** control measure
Marine Order 95 Gives effect to Annex V of MARPOL 73/78	Requirements for offshore discharge of food from MODU and vessels have been incorporated into the **MARPOL 73/78** control measure
Marine Order 96 Gives effect to Annex IV of MARPOL 73/78	Requirements for offshore discharge of sewage from MODU and vessels have been incorporated into the **MARPOL 73/78** control measure
Marine Order 15 Gives effect to Chapter II-2 of SOLAS	Requirements for offshore fire fighter procedures have been incorporated into the **Fire extinguishing media** control measure
IChEMS Establishes nationally consistent standards for managing import, manufacture, export, use and disposal of industrial chemicals	Requirement for chemicals management has been incorporated into the **Hazardous materials selection process** control measures
National Recovery Plan for albatrosses and petrels No specific management action identified	N/A

Internal context
These management processes or procedures were deemed relevant for this aspect: • *Chevron Shipping's Marine Standard Non Tankers: Corporate OE Standard* (Ref. 180) • *Hazardous Materials Management Procedure* (Ref. 181). Control measures related to the above management process or procedure have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.
External context
During relevant persons consultation, no objections or claims were raised regarding these discharges arising from the petroleum activity.

8.8.4 Environmental performance

Table 8-40 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-40: Environmental performance relevant to planned discharges—MODU and vessel discharges

EPO	Control measure	EPS	MC
EPO-24: Planned discharges from general MODU and vessels operations within the OA will not cause lasting changes to water quality. Water quality will return to ambient state within seven days following the cessation of the discharge **EPO-25:** Planned discharges from general MODU and vessels operations within the OA will not cause lasting changes to marine fauna behaviour. Predator-prey dynamics will return to ambient state within seven days following the cessation of the discharge	**CM-23:** MARPOL 73/78	**EPS-23.1:** Oily bilge water will be discharged to marine environment only when the concentration is <15 ppm in accordance with MARPOL 73/78, Annex I: • through an IMO approved on board oil-water separator; and • when the marine vessel is en route.	**MC-23.1:** Records show oily bilge water is discharged in accordance with MARPOL 73/78 Annex I, including current International Oil Pollution Prevention (IOPP) Certificate.
		EPS-23.2: Offshore discharge of food waste from vessels will be in accordance with these MARPOL 73/78 Annex V requirements: • macerated to no greater than 25 mm and when the marine vessel is at least 3 nm from the nearest land; or • unmacerated when the marine vessel is at least 12 nm from the nearest land.	**MC-23.2:** Records show food waste is discharged in accordance with MARPOL 73/78 Annex V.
		EPS-23.3: Offshore discharge of sewage from vessels will be in	**MC-23.3:** Records show sewage is discharged in

EPO	Control measure	EPS	MC
		accordance with these MARPOL 73/78 Annex IV requirements: • an IMO approved comminution and disinfection system to discharge (greater than 3 nm from the nearest land); or • an IMO approved Sewage Treatment Plant at any location; or • untreated sewage discharged ≥12 nm from the nearest land while the vessel is proceeding at no less than 4 knots	accordance with MARPOL 73/78 Annex IV, including current International Sewage Pollution Prevention (ISPP) Certificate (for marine vessels >400 T or certified to carry more than 15 persons).
	CM-24: Fire extinguishing media	**EPS-24:** MODU and vessels operating within the OA will comply with the requirements within Marine Order 15 regarding the use and disposal of PFOS within fire extinguishing media.	**MC-24:** Records show fire extinguishing media meets the requirements of Marine Order 15 and Chapter II-2 of SOLAS.
	CM-25: Hazardous materials selection process	**EPS-25:** Planned discharges to the marine environment are subject to selection and environmental assessment as per CAPL's *Hazardous Materials Management Procedure* (Ref. 181). The environmental assessment process: • identifies the Chemical Hazard and Risk Management (CHARM) colour banding or the OCNS group for non-CHARM products • evaluates the dosage, quantity, and frequency of	**MC-25:** Hazardous materials selection process assessment records (or equivalent).

EPO	Control measure	EPS	MC
		the discharge, and the location and nature of the receiving environment • requires the selection of the least hazardous material where technically and operationally feasible.	

8.9 Planned discharges—Drilling operations

8.9.1 Source of aspect

Activities identified as having the potential to result in drilling-related discharges include:

- production well drilling and completions
- contingency well intervention.

Discharges type may include drilling fluids and cuttings, cement, control fluids, completions fluids, suspension fluids, produced water, MEG, brine, acid wash, metal swarf, cement cuttings, grit, flocculant (Table 4-4). These discharges can occur at or near the sea surface or at or near the seabed.

8.9.2 Drill cuttings and mud dispersion modelling

RPS undertook a sediment dispersion modelling study that considered discharges of drill cuttings and drilling fluids (muds) to the marine environment (Ref. 373) to inform the impact and risk assessment associated with these discharges.

The dispersion modelling was performed using the advanced three-dimensional dispersion model: MUDMAP. This model calculates the transport, spreading, and deposition of discharged cuttings and muds solids over time, based on the prevailing current conditions, the proposed drilling and discharge program, and physical properties of the discharged cuttings and muds solids (Ref. 373). Modelling was conducted using a stochastic approach, where multiple simulations (using the same discharge parameters) were conducted, but under varying oceanographic conditions.

The purpose of the modelling is to provide an estimate of the potential exposure area for sediment deposition (from deposited cuttings and muds on the seabed) and for suspended sediment within the water column.

Scenario

The scenario modelled was batch drilling of the six production wells clustered around the G&E DC. The modelling incorporated these discharge sources:

- continuous discharge of drill cuttings and retained fluids as drilling proceeds
- bulk discharge of drilling fluids at the end of selected hole sections.

The drill cuttings and drilling fluids generated during top-hole drilling are discharged to the seabed; all other discharges occur within surface waters. Table 8-41 lists the key inputs used in the dispersion modelling.

Table 8-41: dispersion modelling inputs

Parameter	Details
Release Location	G&E DC
Total volume of cutting discharged (for all six wells)	3,232.56 m^3
Total volume of muds solids discharged (for all six wells)	1,239.06 m^3
Water depth	1,221 m
Depth of surface discharge	3 m
Number of simulations	100

Exposure criteria

RPS developed two sets of exposure criteria that were used to interpret the potential environmental impacts of sediment deposition and elevated total suspended solids (TSS) within the water column (Table 8-42; Table 8-43; Ref. 373).

The exposure criteria have been based on the response of corals to sedimentation and turbidity stress, as they are recognised as the most vulnerable marine ecosystem to these stressors (Ref. 373). While corals or coral reef systems are not present within the OA (Section 5.3.1.1), applying exposure criteria based on coral responses is considered a very conservative approach to the impact and risk assessment.

Note: Acute effects are typically measured over periods of one to seven days, while chronic effects are assessed over weeks to months (Ref. 374; Ref. 375); however, this study doted shorter durations of 1 hour (acute) and 24 hours (chronic) as this is more appropriate to the operational context of drill cuttings and mud discharges. By applying shorter durations, the exposure criteria remain protective and precautionary (Ref. 373).

Table 8-42: Exposure criteria for sediment deposition

Relative exposure level	Sedimentation rates ($mg/cm^2/day$)	Sediment bottom thickness (mm)	Description
No impact	<10	–	No measurable effect; natural sediment fluxes tolerated
Low exposure	10	1.7	Minor effects; some sediment accumulation
Moderate exposure	30	5.2	Sub-lethal effects
High exposure	>100	>17.4	Smothering, mortality risk

Table 8-43: Exposure criteria for TSS concentrations

Relative exposure level	Acute exposure (1 hour averaged concentration) (mg/L)	Chronic exposure (24-hour averaged concentration) (mg/L)	Description
No impact	<10	<5	Background or natural variability
Low exposure	10	5	Minor physiological stress
Moderate exposure	50	15	Sub-lethal effects

Relative exposure level	Acute exposure (1 hour averaged concentration) (mg/L)	Chronic exposure (24-hour averaged concentration) (mg/L)	Description
High exposure	>100	>50	Mortality risk; chronic exposure particularly harmful

Modelling results

Stochastic modelling results (Ref. 373), for sedimentation and TSS exposure presented in Table 8-44 and Table 8-45, respectively. The maximum distances are presented as distances measured from the mid-point between the wells[124].

The discharge of cuttings and muds will lead to relatively short periods of increased TSS, which is expected to dilute and reduce with distance from the release locations. The modelling results also indicate that the TSS concentrations did not exceed the low exposure criteria for more than 4 hours after the discharge ended (Ref. 373).

Table 8-44: Predicted areas of coverage and maximum distances from mid-point between the wells

Relative exposure level	Total area of coverage (km^2)	Maximum distance (km)
Low	2.00	1.50
Moderate	0.22	0.50
High	0.05	0.16

Table 8-45: Predicted total areas of coverage and maximum distances to acute and chronic exposure from the release locations

Relative exposure level	Total area of coverage (km^2)	Maximum distance (km)
Acute exposure (1 hour averaged concentration)		
Low	4.65	1.82
Moderate	0.22	0.33
High	0.06	0.17
Chronic exposure (24 hour averaged concentration)		
Low (5)	1.37	0.95
Moderate (15)	0.25	0.36
High (>50)	0.03	0.16

8.9.3 Environmental impact and risk evaluation

Planned drilling discharges may result in:

- a localised and temporary change in water quality
- a localised and temporary change in sediment quality
- alteration of BCH.

A localised and temporary change in water quality may result in:

- potential adverse effects to marine fauna.

[124] Refer to Figure 4-1 for indicative location of the wells

8.9.3.1 Consequence evaluation

8.9.3.1.1 Impact: Localised and temporary change in water quality

Planned discharges from drilling,completions and IMR operations (Table 4-4), which occur both at the seabed (e.g. during drilling of the top-hole sections), and at surface, may result in localised and temporary reduction in water quality.

Drill cuttings and drilling fluids

Discharges of drill cuttings and drilling fluids at the seabed are expected to create a localised increase in suspended solids immediately around the well location. In contrast, surface discharges are expected to result in a larger spatial change in water quality due to wider dispersal. The dispersion of the cuttings plume in the water column is influenced by two factors: fluid type (i.e. particle size) and ocean current speed (Ref. 381). Hinwood et al. (Ref. 379) describes that when cuttings are discharged to the ocean from surface, the larger particles which represent ~90% of the mass of the cutting and associated mud solids, form a plume that settles quickly to seabed close to the release point. A similar finding was observed by Jones et al. (Ref. 380) over 95% of the cuttings were greater than 1 mm (and >35% >2 mm) and the settling time to the seabed was minutes to tens of minutes. The remaining solids form a plume in the upper water column that drifts with prevailing currents away from the drill rig and is diluted rapidly in the receiving waters (Ref. 381; Ref. 405). In addition, Neff (Ref. 381) states that in well-mixed oceans waters (as is the case within the OA), the drilling cuttings and fluid plume from a surface discharge is diluted by more than 100-fold within 10 m of the discharge point.

The G&E dispersion modelling (Ref. 373) indicated that the maximum exposure distance of TSS at 10 mg/L, above background, was 1.82 km. Modelling also indicated that TSS concentrations did not exceed the low acute exposure criteria for more than 4 hours after the discharge ended. Therefore, changes in water quality associated with increased suspended solids from drill cuttings and drilling fluid discharges are spatially restricted to areas in relative close proximity to the G&E DC, and once discharges cease, conditions return to ambient levels within a short period of time (hours).

Jones et al. (Ref. 380) conducted a study on drill cuttings and fluid drilling discharges in the NWS region (near Rankin Bank) for another operators drilling program. The study found sporadic and intermittent TSS concentrations (<15 mg/L) ~1,000 m from the discharge point lasting over a period of minutes. By comparison, 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 (Ref. 380).

WBF cuttings and adhered fluids typically disperse more widely and settle slower than NADF thus covering a wider seafloor area (Ref. 384). IOGP suggests that WBF cuttings discharged from a single well within waters deeper than 300 m disperse widely and when settle they may not be detected in sediment at any distance from the well (Ref. 384). Discharges of NADF from the surface settle rapidly (in clumps), under and downstream from the discharge source and may be patchy in distribution, covering a smaller area than WBF discharge plumes (Ref. 385; Ref. 386).

The whole fluids and fluid components of the WBFs comprise components assessed as having low acute toxicity (Ref. 379). Similarly, WBF additives that are typically used are either completely inert in the marine environment, naturally

occurring benign materials, or rapidly biodegradable organic polymers (Ref. 381). These may include barite, bentonite and guar gum, which are listed as an “E” Category fluids under the Offshore Chemical Notification Scheme (OCNS) and considered to pose little or no risk to the environment (PLONOR). Given their inert nature, adverse chemical impacts to water quality from additives to WBF are not predicted to occur.

The proposed drilling method for the petroleum activity uses WBFs; however, NADFs may be used as a contingency. NADF use a non-aqueous base fluid, with water and chemical additives. These components are extremely low-aromatic base oils and low toxicity (Ref. 382, Ref. 383). The environmental effects of NADF are determined by the base fluid used; however, the additives typically adsorb particles in the cuttings (Ref. 384). NADF cuttings are hydrophobic and do not disperse or dissolve in the water column (Ref. 384).

Most of the metals detected in drilling muds are primarily trace impurities in barite, bentonite clay, or the sedimentary rocks (drill cuttings) in the formations penetrated by the drill bit (Ref. 381). Barite, in particular, comprises a significant component of drilling fluid systems (Ref. 387). A study investigating barite solubility and the release of trace metal compounds to the marine environment found that during one week of exposure of barite in seawater, <1% of the mercury, lead, and coper, and 15% of cadmium dissolved from the barite (Ref. 389). However, stock barite has very low concentrations of these components to begin with (Ref. 390) and it is referred to as practically inert from a toxicological perspective (Ref. 389). Considering the low concentrations of heavy metals within stock barite, changes in water quality via the dissolution of these metals are expected to be limited.

Control fluids

Water-based hydraulic control fluids may be discharged both at the seabed and in surface waters. Discharges may occur during BOP testing, HXT installation, well completion and contingency well intervention. BOP testing is expected to result in the highest indicative discharge volumes, with up to ~4.5 m^3 discharged per function and pressure test (Table 4-4).

These water-based fluids are typically diluted (Ref. 391) to ~1–3% with potable water, and rapid dispersion is expected due to small discharge volumes within open marine waters. Modelling undertaken for another offshore drilling project indicates that a release of BOP fluids during function testing is expected to reach a dilution of 3,000 times within a maximum distance of the plume of 98 m (Ref. 391). Based on this information, it is expected that concentrations of BOP control fluid would be ~10 ppm within 100 m of the BOP (for subsea discharges) or the MODU (for surface discharges). Using a conservative ocean current speed of 0.1 m/s (noting that average currents in the region can be up to 0.25 m/s (Ref. 373), fluids would be expected to travel 100 m (and thus reach concentrations of 10 ppm) in ~16 minutes.

Cement

Small volumes of cement (up to ~100 m^3), cement slurry (up to ~115 m^3) or bulk product may be released at either the seabed or at the surface.

Chemical releases from cement are not anticipated since it will be effectively chemically inert (Ref. 391). However, the risk of toxicity may occur from discharges of cement additives (added to dry cement mix). Cement additives are only considered bioavailable before the cement hardens on the seabed. These discharges are designed to set in a marine environment and will therefore set in-

situ. These discharges are limited to the subsea release (i.e. not discharge of dry cement or slurry). Terrens et al. (Ref. 392) suggest that once the cement has hardened, the chemical constituents are locked into the cement. CHARM Implementation Network (Ref. 393) also states that once cement has set it is essentially inert and not likely to have chronic toxicity effects. Before the cement hardens, toxic chemical levels from cement additives will also be subject to rapid dispersion and high dilution rates in the open ocean. The impact of cement additives discharges will therefore be limited to a small area immediately around the well.

Cement discharges also have the potential to result in a localised and temporary change in water quality from an increase in suspended material in the water column. A surface discharge is expected to result in a larger spatial change to water quality than a seabed discharge because there is a greater possibility for wider dispersal given influence by surface currents and wind speeds.

Modelling of cement discharges for another offshore project (Ref. 391) provides an appropriate (but conservative) comparison of the potential extent of exposure cement discharges. The modelling considered significantly larger discharges in comparison to this petroleum activity (i.e. 2 tonnes per well at a rate of 1.3 m^3/min [equivalent to ~78 m^3/hour]). Two hours after the start of discharge, plume concentrations were determined to be between 5 and 50 mg/L with the horizontal and vertical extents of the plume ~150 m and 10 m, respectively. Four hours after ceasing the discharge, modelling indicates that the plume will have dispersed to concentrations <5 mg/L (Ref. 391). On this basis, CAPL expects that changes to water quality will be localised and short term.

Brine, suspension and completion fluids

Brine, suspension and completion fluids will be discharged intermittently, and over short durations during the petroleum activity. Suspension and completion fluids are typically brine-based with various additives (Ref. 394). These discharges typically occur at the surface (Table 4-4). When discharged, brine typically has higher salinity and temperature than seawater (Ref. 395). Monitoring of continuous wastewater discharges (including both desalination brine and cooling water) undertaken by Woodside for its Torosa South–1 drilling program in the Scott Reef complex found that discharge water temperature decreases quickly as it mixes with the receiving waters, with the discharge water temperature being <1°C above ambient within 100 m (horizontally) of the discharge point, and 10 m vertically (Ref. 398). Given the deep offshore location of the petroleum activity and the intermittent nature of the discharges, they are expected to rapidly dilute near the release location.

Produced water

During contingency well intervention activities, produced water which may be present in very low concentrations may be released (Section 4.3.2.1). Produced water may contain a variety of metals (e.g. zinc, lead, copper, cadmium), BTEX compounds, production chemicals, and occasionally naturally occurring radioactive materials (Ref. 396). Any such discharges are expected to rapidly disperse and dilute in the receiving environment (Ref. 397). Given the low discharge volumes and the limited nature of the activity (i.e. contingency well intervention activities only), any changes in water quality are anticipated to be localised and short-term.

MEG

MEG will also be discharged intermittently during the petroleum activity. Discharges may occur during well completion and contingency well intervention, with the highest indicative discharge volume of up to ~100m^3 per well (Table 4-4). MEG has very low aquatic toxicity, is listed on the OSPAR list of substances that are considered to PLONOR to the environment once released, is readily biodegradable, and has low potential for bioaccumulation (Ref. 399; Ref. 400). MEG is also miscible with water and is not expected to accumulate in sediments (Ref. 400). As such, it would disperse quickly if released into the marine environment. Consequently, only a limited short-term change in water quality is expected.

Bulk product

Dry bulk products, such as cement, bentonite, and barite, may be vented to the atmosphere, with solid discharges expected to be <0.2 m^3. These products are referred to as practically inert from a toxicological perspective (Ref. 389; Ref. 393). As such, changes in water quality via the dissolution of these products are expected to be limited. Other chemicals, such as flocculant, marine growth removal fluids, metal swarf are either used infrequently (e.g. during contingency activities) or released in small volumes (≤2 m^3; Table 4-4). These releases are expected to rapidly disperse within the water column.

Summary

Given the intermittent nature and/or small volume of these discharges, combined with the deep offshore location of the OA and the rapid mixing potential influenced by oceanic currents, CAPL considers that changes in water quality from these discharges are spatially limited to a localised area and return to ambient conditions following completion of the discharge. Consequently, the consequence is assessed as Incidental (6).

8.9.3.1.2 Impact: Localised and temporary change in sediment quality

A localised and temporary change in sediment quality may result from particle accumulation or contamination on the seabed, caused by solids in drilling discharges (e.g. drill cuttings, cement, bulk product).

Drill cuttings and drilling fluids

Sediment deposition is expected to be highly localised around the well site (Ref. 381). Drilling cuttings tend to clump together and settle rapidly, with thicker cuttings piles generally located immediately downstream from the discharge. The G&E dispersion modelling (Ref. 373) predicted that sedimentation would occur around the wells at a maximum distance of 1.5 km and total coverage of 2 km^2 at the low exposure level (equivalent to a sediment thickness of 1.7 mm). Predicted distances from the release location decreases with increasing sediment thickness (Table 8-44); the predicted maximum distances at the moderate and high exposure levels were 500 m and 160 m respectively. The Jones et al. (Ref. 380) study of drilling campaign near Rankin Bank indicated build-up of cuttings and muds were identified close to the drilling location (50–75 m in all directions); beyond this distance, the build-up decreased and gradually thinned to a veneer of fine sediments.

The proposed drilling method for the petroleum activity uses WBFs; however, NADFs may be used as a contingency. WBF additives that are typically used are either completely inert in the marine environment, naturally occurring benign materials, or rapidly biodegradable organic polymers (Ref. 381). Barite is a significant component of drilling fluid systems and therefore barium has been

frequently used as a tracer of drilling fluid discharges (Ref. 387). Field studies summarised by IOGP (Ref. 384) found that cuttings and adhered WBF discharged at the seabed could be detected visually or through increases in barium concentrations within 10–150 m of the source, whereas cuttings discharged near the surface accumulated on the seabed at distances of ~0.1–1 km.

The Jones et al. (Ref. 380) study suggests a zone of high impact is likely to be observed 50–75 m in all directions from drilling locations and elevated sediment barium concentrations of up to 3 g/kg may be detected at 50 m, decreasing to 1.2 g/kg and 0.75 g/kg at 100 m and 200 m, respectively. Other studies including Although there are no sediment quality guidelines for barium, the drilling additive barite has a low solubility in seawater (Ref. 402), and has been referred to as practically inert from a toxicological perspective (Ref. 410) and remains on the OSPAR commission list of PLONOR substances.

Bulk product

Barite and bentonite may contain some heavy metal concentrations. Most of the metals detected in drilling fluids (muds) are present primarily as trace impurities in barite, bentonite clay, or the sedimentary rocks (drill cuttings) in the formations penetrated by the drill bit (Ref. 388). The metals of environmental concern (because of their potential toxicity and persistence) that may be present in some drilling fluid barites include cadmium, chromium, copper, mercury, lead, and zinc. These metals are present in barite primarily as inorganic, insoluble sulphide minerals and have limited environmental mobility and low bioavailability (Ref. 388). The Environmental, Health, and Safety Guidelines Offshore Oil and Gas Development (Ref. 413) set stock barite limits of 1 mg/kg and 3 mg/kg for mercury and cadmium respectively. These values are representative of the total heavy metal concentrations in barite (both soluble and insoluble) and a study investigating barite solubility and the release of trace metals to the marine environment recorded that <1% of the mercury and 15% of the cadmium dissolved from the barite after one-week exposure in sea water (Ref. 390). Given the low concentrations of heavy metals including mercury and cadmium in stock barite, and due to the sparingly, low solubility of barite and metal sulphides in seawater, it is expected that environmental consequences associated with the presence of trace heavy metals in barite will be negligible.

Barite and bentonite may also be discharged as bulk products during or at the end of the activity if they cannot be reused or taken back to shore (refer to Section 10.3.3.3). An overboard bulk discharge is expected to disperse over a wide area. As previously noted , metals of environmental concern (because of their potential toxicity and persistence) may be present in barite. However, laboratory testing on industrial barite samples indicates low concentrations of heavy metals including mercury and cadmium are released into seawater (Ref. 389) and, as such, potential environmental impacts associated with these trace metals are expected to be negligible. Consequently, due to the localised area of effect for sedimentation, and trace levels of constituents of concern in drilling fluids and bulk products, no lasting effect on sediment quality is expected.

Cement

Most discharges from cement operations will be at the seabed. These cement discharges are not expected to disperse since it is designed to set in a marine environment and thus will set in situ, limiting its impact to the area directly around the well. BP (Ref. 391) modelled a 200 tonnes seabed cement discharge and determined that impacts would be limited to a radius of ~10 m (depending on the

height of the discharge) from the well. Cement discharges from overflow during drilling operations may permanently affect the seabed within a 10-50 m radius around the well (Ref. 392). Terrens et al. (Ref. 392) suggest that once the cement has hardened, the chemical constituents are locked into the cement, and therefore, toxicological risk to the marine environment is not expected. Consequently, the extent of the discharge is limited to the area directly adjacent to the displaced cement.

Summary

These planned discharges associated with the petroleum activity are expected to result in a localised and temporary reduction in sediment quality. Therefore, CAPL has assessed the impact as Incidental (6).

8.9.3.1.3 Impact: Alteration of BCH

Planned discharges from drilling activities may change sediment or water quality, which has the potential to cause alteration of BCH.

As described in Section 5.3.1.1, the OA is primarily comprised of smooth seabed with bioturbation and scattered patches of bedforms with bare substrate to the north and north-east of the proposed G&E DC. No epibenthic or infauna were identified (Ref. 33), and the OA does not overlap any KEFs.

Drill cuttings and drilling fluids

Discharges of drilling cuttings and fluids can lead to smothering and burial impacts on sessile benthic and epibenthic fauna (Ref. 194; Ref. 380). Kjeilen-Eilertsen et al. (Ref. 403) recommended a conservative sediment thickness threshold of 5 mm for assessing burial effects on benthic fauna, while other studies reported thresholds of 24 mm (Ref. 404; Ref. 376) and as low as 3 mm for certain species (Ref. 404). Elevated TSS levels may also present a hazard for filter feeder communities (Ref. 380). Sponges are particularly susceptible to increased TSS (Ref. 377). A study on five sponge species showed that prolonged exposure (28 days) to suspended sediment concentrations ≥23 mg/L negatively affected feeding behaviour and depleted energy reserves (Ref. 378).

The effect criteria used in the G&E dispersion modelling (Ref. 373) were based on coral response to sedimentation and TSS, but are comparable or more conservative than the literature described above for other benthic receptors. The modelling indicated sedimentation at the moderate (5.2 mm) and high (>17.4 mm) exposure levels were up to 500 m and 160 m from the G&E DC respectively. While sedimentation at the low exposure (1.7 mm) level which is only expected to have minor effects to BCH extended up to 1.5 km from the G&E DC (Table 8-42; Table 8-44). Similarly, the modelling indicated the above background TSS concentrations at the moderate and high exposure levels were up to 360 m and 170 m from the G&E DC respectively. While TSS at the low exposure level which is only expected to have minor effects to BCH extended up to 1.82 km from the G&E DC (Table 8-43; Table 8-45). However, given that the BCH within the vicinity of the G&E DC is primarily comprised of smooth seabed with no observations of infauna or epifauna, the effects of localised sediment or temporarily elevated TSS to BCH is expected to the limited.

Cement

Cement discharges during drilling activities have the potential to permanently smother and alter the benthic substrate. The extent would be limited to 10–50 m radius around each well (Ref. 392) and is considered a highly localised impact.

Summary

Given the intermittent and temporary nature of the discharges, the small spatial extent of area impacted, the lack of complex seabed structures, and no epibenthic or infauna were identified in the G&E DC, the planned discharges from drilling activities are expected to result in localised alteration of BCH. Consequently, the consequence has been assessed as Minor (5).

8.9.3.1.4 Risk: Potential adverse effects to marine fauna

A change in water quality as a result of planned discharges from drilling activities has the potential to cause indirect impacts to marine fauna arising from chemical toxicity. The indicative volumes of drilling related discharges are outlined in Table 4-4.

As identified in Section 5.3.3, several marine species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. The presence of these species (including marine mammals, reptiles, and pelagic and demersal fishes) are expected to the transitory, with no known aggregation areas within the vicinity of the OA.

IOGP (Ref. 384) indicates that in general, marine fauna are at low risk of harm from drilling discharges, due primarily to the rapid rate of dilution and dispersion in the water column following discharge (Ref. 384). WBF has been shown to have little or no toxicity to marine organisms (Ref. 406), and that lack of toxicity and low bioaccumulation potential of the drilling fluids means the effects of the discharges are highly localised and are not expected to spread through the food web (Ref. 405). Several metal bioaccumulation bioassays of WBF cuttings found that metal concentrations in the tissues of exposed animals were very similar to those in the tissues of unexposed animals (Ref. 384).

Further, as described above, predicted changes to water quality are a localised and temporary. Therefore, while transient marine fauna, which includes marine mammals, reptiles, and fishes, would have the potential to be exposed to these discharges, the concentration of bioavailable contaminants is expected to be low. As such, the potential for sublethal effects to marine fauna has been evaluated as Incidental (6).

8.9.3.2 Control measures

Table 8-46 and Table 8-47 describe the control measures relevant to this aspect.

Table 8-46: Good practice control measures relevant to planned discharges—drilling operations

Control measure	Description
CM-25: Hazardous materials selection process	Planned discharges to the marine environment are subject to selection and environmental assessment as per CAPL's *Hazardous Materials Management Procedure* (Ref. 181). The environmental assessment process: • identifies the Chemical Hazard and Risk Management (CHARM) colour banding or the OCNS group for non-CHARM products • evaluates the dosage, quantity, and frequency of the discharge, and the location and nature of the receiving environment • requires the selection of the least hazardous material where technically and operationally feasible

Control measure	Description
CM-26: Wells fluid field guidelines offshore	Where selected for use, NADFs are managed in accordance with CAPL's *Wells Fluid Field Guidelines Offshore* (Ref. 411), including: • no whole NADF will be discharged to the environment • NADF will not be used to drill top holes • ensure that any displaced fluids potentially contaminated with NADF have <1% v/v residual synthetic based oil prior to discharge.
CM-27: Stock barite management	Table 1 of the *Environmental, Health, and Safety Guidelines Offshore Oil and Gas Development* (Ref. 412) provides the following limits for barite: • mercury: maximum 1 mg/kg dry weight in stock barite • cadmium: maximum 3 mg/kg dry weight in stock barite. The Environmental, Health, and Safety Guidelines are considered reference documents containing general and industry specific examples of offshore international industry practice. CAPL has adopted the recommended stock barite mercury limit as a control measure to address reducing releases of mercury to the environment as also required by the Minamata Convention.
CM-28: Unused bulk product process	CAPL will manage unused bulk product in accordance with Section 10.3.3.3. If unused bulk product cannot be passed on to the next operator, or another MODU in the region, an assessment will be undertaken to ensure discharge to the marine environment only occurs when there are no other safe or feasible options and impacts and risks associated with the discharge can be managed to ALARP and acceptable levels. This assessment will consider available onshore disposal options, including the use of IsoPump technology for the safe backloading and transport of surplus bulk powdered products to shore (Section 10.3.3.3).
CM-30: Oil in water concentrations	Any produced water circulated to the MODU during well intervention activities will have <30 ppm oil-in-water concentration prior to discharge.

Table 8-47: Additional control measures evaluated for planned discharges—drilling operations

Control measure	Benefit	Cost
CM-31: Submerged cuttings outlet	Setting the cuttings discharge outlet below the waterline promotes discharge directly into the water column, reducing interaction with the sea surface and supporting the rapid dilution and dispersion of cuttings and drilling fluids within the receiving environment.	Negligible. The cuttings discharge outlet has been designed and planned to be installed below the waterline. No additional equipment or operational changes are required to implement this control measure. Therefore, it has been adopted for use.
Extended submerged cuttings outlet	Extending the cuttings discharge outlet further below the waterline may further reduce interaction with the sea surface and increase the opportunity for initial dilution and dispersion within the water column. Dispersion modelling (Ref. 373; Section 8.9.2) predicts TSS concentrations at 10 mg/L to be highly localised, and did not exceed the low acute exposure criteria for more than 4 hours after the discharge ended. Consequently, extending the outlet further below the waterline would provide limited additional environmental benefit,	The cuttings discharge outlet is already designed to be at maximum operational outlet depth of ~11.5 m below the waterline (at drilling draft) and is flush with the bottom of the MODU hull. Extending the outlet further below the hull would result in an increased length of discharge line without adequate support to control movement. This would result in significant static and cyclic loading at the hull connection and associated structural fatigue. Any change in discharge line length would therefore require further engineering, together

Control measure	Benefit	Cost
	with no reduction in residual environmental risk.	with structural and fatigue assessment and verification, to demonstrate safe operation. Implementation, installation and function testing of the modification would cost ~$10–20 M. In addition, as the MODU is of a shipshape design, any extrusion beyond the hull of the vessel will impact operating dynamics of the vessel and require re-evaluation of hydrodynamic drag, DP capability with increased fuel burn and thruster utilisation, which may increase atmospheric and underwater sound emissions associated with MODU operations. Furthermore, reduction in station keeping performance also has the potential to increase personnel and facility safety risks. To maintain safe operation, the extended outlet could also only be operated within a limited environmental operating window and would require retrieval if environmental conditions exceeded applicable design limits, introducing significant operational constraints and potentially extending the duration of the petroleum activity. The safety risks and costs associated with implementing this control measure are considered grossly disproportionate to the environmental benefit gained. Therefore, the control measure has not been adopted.
Contain and transfer cuttings to shore for treatment	Containing and transferring cuttings to shore will reduce impacts and risks to BCH; The extent of the potential impact from drilling cuttings discharges was predicted to be up to 1.5 km around the wells. The OA is primarily comprised of smooth seabed with bioturbation and scattered patches of bedforms with bare substrate. No epibenthic or infauna were identified around the proposed DC. Consequently, this control measure is considered to provide a limited environmental benefit given the relatively small extent of the predicted impact area and the absence of complex BCH. Recovery would be expected over time.	This option has high costs associated with transferring cuttings to shore, requiring additional load-outs, dedicated vessels, and docking time, as well as increased emissions associated with the logistics chain. Implementation would also increase operational complexity and may result in port congestion, schedule delays, and additional HSE risks associated with handling and transport. Given the limited environmental benefit and the significant logistical, operational and HSE implications associated with implementation, the costs and additional risks of this option are considered to be grossly disproportionate to the environmental benefit gained. Therefore, the control measure has not been adopted.
Use riserless mud recovery (RMR)	RMR is typically used where borehole stability concerns require an engineered drilling fluid system to	Implementation of RMR would involve ~2 extra MODU days per well to mobilise, rig up, test and

Control measure	Benefit	Cost
system for top hole section	be used in place of seawater and gel sweeps. It may also be used to enable a hole section to be drilled deeper, potentially eliminating a casing section. However, based on typical tope hole/ riserless drilling experience in the NWS, wellbore stability issues in the riserless section are not anticipated. RMR has the potential to reduce direct seabed deposition of cuttings generated during riserless drilling. However, RMR can only be used once the low-pressure (LP) wellhead has been installed, as the RMR equipment must connect directly to the LP wellhead. Consequently, the primary environmental benefit would be a reduction in direct seabed deposition of cuttings from the surface hole section. If RMR were successfully deployed, the cuttings returned to the MODU would still require management, either through discharge overboard or containment and transport to shore for disposal. The well location primarily comprises smooth seabed with bioturbation and scattered patches of bedforms with bare substrate with no epibenthic or infauna identified around the proposed DC (Section 5.3.1.1). As described in Section 8.9.3.1.3, alteration of BCH from drill cuttings deposition is expected to be localised (within the OA). In addition, these sections are planned to be drilled with WBF which typically comprise components with low acute toxicity (Ref. 379), and WBF additives that are either completely inert in the marine environment, naturally occurring benign materials, or rapidly biodegradable organic polymers (Ref. 381). Given the limited extent of the cuttings deposition that RMR could prevent, the low complexity BCH around the proposed DC, and the low toxicity and environmental persistence of the WBF components, the environmental benefit associated with implementing RMR is considered limited.	operate the equipment (~$1.5 M based on a conservative rig rate of $750,000 per day), plus RMR equipment rental and specialist personnel (~$1 M). Consequently, the total implementation cost is estimated to be ≥$2.5 M per well (≥$15 M across the petroleum activity). A further one-off cost of ~$1 M would also be required for RMR mobilisation and demobilisation, rig integration activities, and any vessel or shipyard modifications required to support RMR deployment. Overall, implementation costs are therefore estimated to ~$16 M across the petroleum activity. In addition, increasing the MODU duration (either for discharge overboard or transport offshore) may also increase potential environmental impacts and risks associated with the presence of the MODU and any additional support vessel. Safety risks would also increase due to the high frequency of support vessel activity alongside the rig and the increased rate of crane lifting required if a cuttings skip/drilling waste container system were employed. Consequently, the HSE risks and costs associated with the implementation of RMR are considered grossly disproportionate to the environmental benefit gained. Therefore, the control measure has not been adopted for use.
Slim hole well design	Implementing a slim hole well design would result in a small, yet direct, reduction of the volumes of cuttings and drilling fluids discharged to the marine environment.	The well design was developed taking into account the reservoir objectives, completion requirements, long-term well integrity, and intervention needs, which together defined the minimum completion envelope required to safely develop the field. The wellbore architecture

Control measure	Benefit	Cost
		was optimized around these requirements to maximize completion capability and recovery from each well. This minimizes the number of wells and associated infrastructure required to achieve the field development objectives and reduces the associated environmental footprint. Well sizing assessments completed during concept development evaluated opportunities to reduce hole diameter across individual well sections. The selected design provides the best balance between completion reliability, operational robustness, sand control performance, and long-term well productivity. Any further reductions in hole size would reduce the operating window, resulting in additional exposure to well execution risks, impacting both well integrity and installation reliability. Slim hole well design would narrow the operational drilling margin between the expected pressure and the lowest pressure at which the exposed rock in the uncased section of the well would fracture (the minimum open-hole fracture gradient). For example, in the 8½" reservoir section (Section 4.2.1), this margin is already only ~0.5 to 1.4 ppg across the six planned wells. A further reduction would therefore increase well construction risk and the risk of fluid losses to the formation, could introduce well control risks and affect the ability to deliver a reliable well for long-term gas production. The well design uses a 5" shunted open-hole gravel pack completion in a gauge 8½" reservoir section, which removes the need for underreaming. This reduces the volume of formation drilled and the quantity of cuttings generated within the reservoir interval, and simplifies well construction, while maintaining the required completion functionality, sand control performance and well integrity. It also provides a robust well integrity and sand control solution for the life of the development, reducing the likelihood of fluid losses, remediation and future interventions. As a result, the selected well architecture already minimizes the overall environmental footprint of the project while meeting reservoir, safety, operational, and

Control measure	Benefit	Cost
		well integrity objectives. Further reductions in hole size are not considered technically feasible due to the resulting increase in well construction risk and reduced operational reliability. Therefore, the control measure has not been adopted.
CM-32: Limit NADF to contingency use only	WBF are inherently less toxic than NADF and therefore will result in a reduction of potential environmental impacts and risks associated with drilling fluid use during the petroleum activity. However, NADF can provide operational benefits in drilling conditions where wellbore instability may be encountered, including hydrate inhibition, reduced differential sticking, increased penetration rates, and suitability for high bottom-hole temperatures.	CAPL has determined that a technically suitable WBF solution is available for this drilling program. Testing has been undertaken to optimise the WBF system for anticipated G&E well design and geological conditions, including wellbore stability requirements, and to support drilling to total depth with minimal hole-related issues. As such, WBFs have been selected as the preferred drilling fluids. However, should unforeseen geological conditions, downhole conditions, or wellbore instability be encountered during drilling, NADF may be required to enable safe drilling operations. Consequently, NADF has been retained as a contingency option for the bottom-hole sections (see Table 4-3) and will only be used where operational conditions require their use. Therefore, the control measure has been adopted for use.
CM-29: Dual-drive vertical cuttings dryer	A dual-drive vertical cuttings dryer can minimise synthetic fluid discharge; therefore, reducing the volume of drilling fluids adhered to cuttings and associated potential toxicity effects. However, this method also reduces cuttings particle sizes, potentially increasing plume extent and turbidity impacts. As described in Section 8.9.3.1.4, marine fauna are expected to be transitory, with no known aggregation areas within the vicinity of the OA. Changes in water quality are predicted to be short term and confined to the immediate vicinity of the discharge. Dispersion modelling (Ref. 373; Section 8.9.2) also indicated that TSS concentrations did not exceed the low acute exposure criteria for more than 4 hours after the discharge ended. As such, while marine fauna may be exposed to these discharges, potential exposure is expected to be limited. Consequently, further reducing the volume of drilling fluids adhered to cuttings would provide limited additional environmental	Previous offshore drilling campaigns using synthetic-based mud, including NADF, and conventional single-drive vertical cuttings dryers achieved a well-average synthetic oil on dry cuttings concentration of ~6.5%, equivalent to ~5.8% on wet cuttings. This performance included periods where specific batches of cuttings bypassed the dryer, such as during drill-out of cement and shoe-track equipment, to mitigate plugging risks. Implementing an enhanced dual-drive vertical cuttings dryer configuration upgrades the solids-control equipment already committed for this petroleum activity. The increased retention time within the dryer bowl is expected to improve synthetic fluid recovery compared with the previously utilised single-drive units, with any cuttings unsuitable for dryer processing segregated, collected in dedicated waste skips, and transported onshore for treatment and disposal. The dual-drive configuration requires no material increase in mobilisation lead time, deck footprint, or

Control measure	Benefit	Cost
	benefit, with no reduction in residual environmental risk.	operational complexity relative to the standard solids-control spread. Based on historical performance, the anticipated improvement in dryer efficiency, and well characteristics including hole size, length and oil on cuttings, a well-average synthetic oil on wet cuttings concentration of ≤4.9% represents the lowest practicable concentration achievable for this petroleum activity should NADF be required. Further reduction would require implementation of thermal desorption, which has been assessed as not reasonably practicable for this petroleum activity (see thermal desorption unit [TDU] assessment below). While implementation of dual-drive vertical cuttings dryer is likely to provide a limited environmental benefit, this benefit is considered to outweigh the operational and financial costs. Therefore, the control measure has been adopted.
TDU	Thermal desorption can result in very dry solids with residual synthetic base fluid on cuttings reduced to less than 1% w/w. This is the most viable equipment for achieving this level of performance and therefore reducing the volume of drilling fluids adhered to cuttings and associated potential toxicity effects. However, this method also reduces cuttings particle sizes, potentially increasing plume extent and turbidity impacts. As described in Section 8.9.3.1.4, marine fauna are expected to be transitory, with no known aggregation areas within the vicinity of the OA. Changes in water quality are predicted to be short term and confined to the immediate vicinity of the discharge. Dispersion modelling (Ref. 373; Section 8.9.2) also indicated that TSS concentrations did not exceed the low acute exposure criteria for more than 4 hours after the discharge ended. As such, while marine fauna may be exposed to these discharges, potential exposure is expected to be limited. Consequently, further reducing the volume of drilling fluids adhered to cuttings would provide limited additional environmental benefit, with no reduction in residual environmental risk.	NADF is retained only as a contingency (see **CM-32**) in case the primary high-performance water-based mud (HPWBM) system cannot deliver the required chemical inhibition and wellbore stability. Any TDU investment would therefore support a contingency that may never be used. A TDU installation would require the processing unit as well as cuttings transfer equipment, surge and holding tanks, supporting utilities, and dedicated material handling arrangements. While the vessel has substantial payload and power generation capacity, deck space, equipment integration requirements, utility tie-ins, and hazardous area constraints would limit the ability to install this equipment safely. Installation and operation would also increase HSE risks through additional personnel, increased crane lifts and dropped object risk, high-temperature and rotating equipment hazards, and deck congestion. Furthermore, a TDU may not be capable of processing cuttings at the generation rate associated with high-rate of penetration sections. For example, cuttings generation rates during drilling of a 12¼-inch interval at ~50 m/hour may exceed the continuous processing capacity of many offshore TDU systems.

Control measure	Benefit	Cost
		Cuttings would then need to be stored and processed offline. This would require the installation of additional cuttings storage tanks or skips and an associated transport system, increasing deck space use, materials handling, and reliance on crane availability, which may be restricted during adverse weather. Mobilisation, installation and demobilisation of a TDU are estimated at ~$1.1 M, with running costs of ~$29,000/day. The system would take ~9.5 months to mobilise, install and commission, so it would need to be committed before drilling starts to be available when needed. If NADF were required after the campaign had started, this lead time would make a TDU impractical. Retrofitting a TDU while the drilling unit is on location would also introduce significant schedule delays, safety risks and operational disruption. Given the costs, lead time, logistical and operational constrains as well as additional HSE risks, TDU implementation is considered grossly disproportionate to the environmental benefit. Therefore, the control measure has not been adopted for use.

8.9.3.3 ALARP justification

Offshore drilling operations are commonplace and well-practised nationally, and internationally. The control measures to manage the impacts and risk associated with these planned discharges are well understood and implemented by the petroleum industry and CAPL.

During relevant persons consultation, claims were raised regarding impacts from planned discharges associated with drilling operations. CAPL responded to these claims (see summary in 'external context' [Section 8.9.4] and within Appendix E.

Dispersion modelling has been used to inform the spatial extent of the potential exposure areas, and this is considered an appropriate basis to inform environmental risk assessments.

Based on the environmental impact and risk evaluation and application of relevant assessment tools as commensurate with the predicted level of impact and risk (e.g. higher-order impacts and risks), CAPL considers the adopted good practice and additional control measures (Section 8.9.3.2) are appropriate to manage the potential impacts and risks from planned discharges from drilling operations. No further reasonably practicable control measures were identified that would provide a meaningful reduction in environmental impact or risk without incurring grossly disproportionate costs. Accordingly, CAPL considers the potential environmental impacts and risks associated with this aspect to be reduced to ALARP.

8.9.3.4 Likelihood and risk level summary

Due to the localised nature of drilling discharges, lack of sedentary sensitivities, the limited values and sensitivities within the OA and the control measures in place, CAPL considers the likelihood and residual risk as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential adverse effects to marine fauna			
Marine fauna	Incidental (6)	Unlikely (4)	Very Low (9)

8.9.4 Demonstration of acceptability

Table 8-48 describes the demonstration of acceptability relevant to this aspect.

Table 8-48: Demonstration of acceptability relevant to planned discharges—drilling operations

Comparison with acceptable level
Acceptable levels AL-01, AL-02, AL-12, AL-13, AL-14 and AL-15 are applicable to planned discharges from drilling operations associated with the petroleum activity (refer to Section 6.7). Changes to water and sediment quality are predicted to be localised and temporary, with short-term impacts to BCH and potentially a small number of transitory marine fauna (Section 8.9.3.1). These predicted impacts are not expected to substantially affect the biodiversity, ecosystem function, or integrity of the OA or result in impacts at population level that would prevent long-term recovery or survival. As such, the predicted level can be managed to be equivalent or better than the acceptable levels AL-01, AL-02, AL-12, AL-13, AL-14 and AL-15.
Principles of ESD
Precautionary Principle In accordance with Table 6-2, a consequence level of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required. *Biodiversity Principle* The impacts and risks associated with this aspect are expected to be highly localised and short-term, resulting in temporary changes to water and sediment quality with localised impacts to BCH and the potential for sublethal toxicity effects to a small number of transitory marine fauna, which is not expected to result in effects at a population level that would prevent their long-term recovery or survival. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity
Relevant environmental legislation and other requirements
Legislation and other requirements considered relevant for this aspect include: • *Minamata Convention on Mercury* (Ref. 15) • *Industrial Chemicals Environmental Management Standard* – (IChEMS) • *National Recovery Plan for albatrosses and petrels* (2022) *(*Ref. 304*)* • *Wildlife Conservation Plan for Seabirds* (Ref. 80). CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:

Requirement	Demonstration
Minamata Convention on Mercury Controlling, and where feasible, reducing releases of mercury or mercury compounds to land and water	Requirement for controlling and reducing releases of mercury has been incorporated into the **stock barite management** and **solids control equipment** control measures

IChEMS Establishes nationally consistent standards for managing import, manufacture, export, use and disposal of industrial chemicals	Requirement for chemicals management has been incorporated into the **Hazardous materials selection process** control measures
National Recovery Plan for albatrosses and petrels No specific management action identified	N/A
Wildlife Conservation Plan for Seabirds *Action 2d:* Ensure all areas of important habitat for seabirds are considered appropriately and consistently in the development assessment process.	The OA overlaps the breeding BIA for wedge-tailed shearwaters. The OA is ~75 km north-east of the Montebello Island and ~93 km north-east of Barrow Islands. As such, it does not intersect with breeding islands or nesting habitat. Section 8.9.3 provides an impact and risk evaluation for drilling-related discharges and control measures have been identified. Therefore, this activity is not considered to be inconsistent with the *Wildlife Conservation Plan for Seabirds.*
Internal context	
These management processes or procedures were deemed relevant for this aspect: • *Hazardous Materials Management Procedure* (Ref. 181) • *Wells Fluid Field Guidelines Offshore* (Ref. 411) • Process for management of unused bulk product (Figure 10-4) Control measures related to the above management process have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.	
External context	
During relevant persons consultation the following claims were raised: • regarding potential cumulative impacts associated with decreased water quality affecting key fish species. CAPL provided a response that confirmed: – the potential cumulative impacts from the petroleum activity and other activities occurring in the vicinity of the OA were considered. As per Section 8.9.2, the exposure area for impacts associated with planned discharges was limited to within the OA. As per Section 5.4.6, no other petroleum activities have been identified within the OA. As such, cumulative impacts associated with drilling discharges are not considered credible. The impacts to water quality as a result of these discharges is considered within the EP in Section 8.9.3.1. • regarding potential impacts from marine chemical discharges affecting tuna species. CAPL provided a response that confirmed: – CAPL has assessed planned discharges (including discharges from drilling operations) and their potential impacts to water quality as part of the impact and risk assessment. CAPL noted that changes in water quality from these discharges are limited to a localised area and return to ambient conditions following completion of the discharge. This is considered within the EP in Section 8.9.3.1. No further objections or claims were raised regarding planned discharges from drilling operations arising from the activity.	

8.9.5 Environmental performance

Table 8-49 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-49: Environmental performance relevant to planned discharges—drilling operations

EPO	Control measure	EPS	MC
EPO-28: Planned discharges from drilling operations within the OA will not cause lasting changes to water quality. Water quality will return to ambient state within seven days following the cessation of the discharge. **EPO-29:** Planned discharges from drilling operations within the OA will only cause localised changes to sediment quality (i.e. within the vicinity of the drill centres). **EPO-30:** Planned discharges from drilling operations within the OA will only cause localised changes to benthic habitats and communities (i.e. within the vicinity of the drill centres). **EPO-31:** Planned discharges from drilling operations within the OA will not cause toxicity effects to benthic habitats or marine fauna.	**CM-25:** Hazardous materials selection process	**EPS-25:** Planned discharges to the marine environment are subject to selection and environmental assessment as per CAPL's *Hazardous Materials Management Procedure* (Ref. 181). The environmental assessment process: • identifies the Chemical Hazard and Risk Management (CHARM) colour banding or the OCNS group for non-CHARM products • evaluates the dosage, quantity, and frequency of the discharge, and the location and nature of the receiving environment • requires the selection of the least hazardous material where technically and operationally feasible.	**MC-25:** Hazardous materials selection process assessment records (or equivalent).
	CM-26: Wells fluid field guidelines offshore	**EPS-26:** Where selected for use, NADFs are managed in accordance with CAPL's *Wells Fluid Field Guidelines Offshore* (Ref. 411), including: • no whole NADF will be discharged to the environment • NADF will not be used to drill top holes • ensure that any displaced fluids potentially contaminated with NADF have <1% v/v residual	**MC-26:** Records show that drilling fluid management procedures for NADF were implemented.

EPO	Control measure	EPS	MC
		synthetic based oil prior to discharge.	
	CM-27: Stock barite management	**EPS-27:** Mercury and cadmium concentrations in stock barite will be limited to: • mercury: maximum 1 mg/kg dry weight • cadmium: maximum 3 mg/kg dry weight.	**MC-27:** Records confirm that stock barite meets the maximum mercury and cadmium concentration specifications.
	CM-28: Unused bulk product process	**EPS-28:** CAPL will implement their management process for unused bulk product (barite, cement, and bentonite) as per Section 10.3.3.3**.**	**MC-28:** Records demonstrate that the process outlined in Section 10.3.3.3 was followed for the management of unused bulk product.
	CM-29: Dual-drive vertical cutting dryer	**EPS-29:** Volumes of drill fluids discharged will be minimised to **≤4.9%** w/w on wet cuttings through the use of dual-drive vertical cutting dryer equipment.	**MC-29:** If NADF is required, records confirm dual-drive vertical cutting dryer is used and discharge volumes are tracked.
	CM-30: Oil in water concentrations	**EPS-30:** Any produced water circulated to the MODU during well intervention activities will have <30 ppm oil-in-water concentration prior to discharge.	**MC-30:** Records confirm that produced water discharges meet the oil in water concentration specifications.
	CM-31: Submerged cuttings outlet	**EPS-31:** Cutting discharge outlet will be below the water line.	**MC-31:** Records confirm the cuttings discharge point is set below the water line.
	CM-32: Limit NADF to contingency use only	**EPS-32:** NADF will be used as a contingency option only.	**MC-32:** If NADF use is required, records confirm the technical justification for its use.

8.10 Unplanned disturbance—Fauna interaction

8.10.1 Source of aspect

Activities identified as having the potential to result in fauna interaction are:

- temporary presence of MODU, vessels and ROV/AUV within the OA during the drilling activity

- temporary presence of helicopters within the OA during the drilling activity.

8.10.2 Environmental risk evaluation

Unplanned interactions with marine fauna may result in:

- injury or mortality of marine fauna.

8.10.2.1 Consequence evaluation

8.10.2.1.1 Risk: Injury or mortality of marine fauna

During the petroleum activity, the MODU and up to two vessels and ROV/AUV will be present within the OA at any time. The estimated duration for the drilling campaign is 12-18 months, and contingency IMR activities (i.e. well intervention) may take up to ~50 days. Helicopter will be also present within the OA with an expected routine fight frequency of ~5 flights per week. The OA is located in water depths of ~1,100 m–1,300 m and is ~75 km north-east of the Montebello Island and ~93 km north-east of Barrow Islands.

Surface-dwelling marine fauna are most at risk from this unplanned interaction and thus are the focus of this evaluation.

Marine mammals

As identified in Section 5.3.3.1, several marine mammals species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. The pygmy blue whale migration BIA was identified overlapping with the OA.

Cetaceans are naturally inquisitive marine mammals that are often attracted to offshore vessels and facilities. The reaction of whales to the approach of a vessel is quite variable. Some species remain motionless when near a vessel, while others are curious and often approach vessels that have stopped or are slow moving, although they generally do not approach, and sometimes avoid, faster-moving vessels (Ref. 288).

A review of the documents made or implemented under the EPBC Act for threatened and/or migratory cetacean species that may be present within the OA (i.e. blue whale [Ref. 52]; fin whale [Ref. 282]; sei whale [Ref. 283]; Australian humpback dolphin [Ref. 284]; Australian snubfin dolphin [Ref. 285]) indicates that either vessel disturbance or interaction (such as collisions) are a key threat to the recovery of the species. Management actions are limited to incident reporting via the national database (refer to Section 10.6.2) and ensuring that the risk of vessel strike is assessed and appropriate mitigation measures are implemented, where required (see the text below and Section 8.10.2.2).

The *Conservation Management Plan for the Blue Whale 2015–2025* (Ref. 52) indicates that although all forms of vessels can collide with whales, severe or lethal injuries are more likely to occur by larger or faster vessels. Nisi et al. (Ref. 286) indicate that reducing vessel speed lowers both the likelihood and severity of whale-ship collisions. Laist et al. (Ref. 287) found that larger vessels with reduced manoeuvrability moving >10 knots may cause fatal or severe injuries to cetaceans, with the most severe injuries caused by vessels travelling >14 knots.

There have been few recorded instances of cetacean deaths in Australian waters. Mackay et al. (Ref. 289) report that four fatal and three non-fatal collisions with southern right whales were recorded in Australian waters between 1950 and

2006, with one fatal and one non-fatal collision reported between 2007 and 2014. The death of a Bryde's whale in Bass Strait in 1992 (Ref. 290) was also recorded, noting this data indicates deaths are more likely to be associated with container ships and fast ferries.

The OA overlaps with the pygmy blue whale migration BIA. As the petroleum activity may occur year-round, there is potential for overlap with the predicted migration periods. However, based on satellite tracking and acoustic detection studies, it is expected that pygmy blue whales use a broader migration corridor (i.e. extending further offshore than the defined BIA, Section 5.3.3.1.1). As such, only low numbers of transitory whales are expected to cross the OA.

Fauna strikes are not expected due to the low numbers of transitory marine mammals expected within the OA, the limited vessel numbers within the OA, and the fact that fauna strikes have been demonstrated to be very rare. If a fauna strike occurred leading to mortality, it would result in individual impacts and is not expected to have a detrimental effect on the overall population. As such, a conservative consequence ranking of Minor (5) has been applied due to the potential for injury or mortality to individual EPBC-listed marine mammal species.

Marine reptiles

The *Recovery Plan for Marine Turtles in Australia* (Ref. 291) identifies vessel disturbance as a key threat; however, it also notes that this is particularly an issue in shallow, coastal foraging habitats, internesting areas with high numbers of recreational and commercial craft, or in areas of marine development. No BIAs or HCTS of marine turtle species overlap the OA. Given the OA is located in deep (>1,100 m) offshore waters (~75 km to the nearest land), turtle presence is expected to be limited to transient individuals and risks associated with the physical presence of the MODU, vessels and/or ROV/AUV are not expected. If a fauna strike occurred leading to mortality, it would result in individual impacts and is not expected to have a detrimental effect on the overall population. As such, a conservative consequence ranking of Minor (5) has been applied due to the potential for injury or mortality to individual EPBC-listed marine reptiles species.

Fishes, including sharks and rays

A review of the documents made or implemented under the EPBC Act for listed threatened and/or migratory sharks species identified within the OA did not identify vessel disturbance or strike as a threat, except for whale sharks. The C*onservation Advice for the Whale Shark* (Ref. 292) indicates that conservation actions should consider minimising offshore developments and transit time of large vessels in areas close to marine features likely to correlate with whale shark aggregations (Ningaloo Reef, Christmas Island and the Coral Sea) and along the northward migration route that follows the northern Western Australian coastline along the 200 m isobath. The OA does not overlap with these areas, and no BIAs for whale sharks were identified within the OA. Given the OA location, whale shark presence is expected to be limited to transient individuals and risks associated with the physical presence of the MODU and vessels are not expected. If a fauna strike occurred leading to mortality, it would result in individual impacts and is not expected to have a detrimental effect on the overall population. As such, a conservative consequence ranking of Minor (5) has been applied due to the potential for injury or mortality to individual EPBC-listed fishes, including sharks and rays.

Seabirds and migratory shorebirds

The risk of injury or mortality to seabirds and migratory shorebirds may occur during helicopter take-off or landing associated with passenger transfer / crew change operations, collision with the MODU/vessels or interactions with gas flares. A review of the documents made or implemented under the EPBC Act for listed threatened and/or migratory birds species identified within the OA did not identify helicopter disturbance or strike as a threat, except for the *Wildlife Conservation Plan for Seabirds* (Ref. 80); however, it also notes that this is particularly an issue to those aircrafts flying low over breeding islands and nesting habitats. There are no islands within or adjacent to the OA. In addition, the OA is ~75 km north-east of the Montebello Island and ~93 km north-east of Barrow Islands. Given this distance, bird presence is expected to be limited to transient individuals.

Migratory birds with potential migration routes overlapping with the OA may be at higher risk. In regions such as Canada and the Gulf of Mexico, bird injury or fatalities due to collisions and burns have been reported (Ref. 296; Ref. 297). In the Gulf of Mexico, collisions with platforms were common during autumn, as most migrants were aloft over the platforms during nighttime hours in that season (Ref. 297). It is also noted that this impact is considered negligible compared to other anthropogenic sources of mortality (Ref. 297). Studies in the North Sea have found that bird deaths from flaring are rare, with some facilities reporting no direct mortality (Ref. 298). When incidents occur, they typically happen during foggy or overcast conditions (Ref. 298). These conditions are not typical in the NWS. The OA overlaps the breeding BIA for wedge-tailed shearwaters. They typically begin arriving at their WA colonies around August; and then leave nests in early-April to early-May (Ref. 83; Ref. 84).

Given the low frequency of helicopter flights within the OA (~5 flights per week), the low speeds during take-off or landing, and the limited vessel numbers within the OA, the risk of bird strike from helicopters is expected to be limited. Similarly, flaring activities are contingent (i.e. occurring during contingency well intervention activities). As such, while there is a risk of bird strike resulting in severe injuries or mortality to a small number of individuals, it is not expected to have a detrimental effect on the overall population and would therefore result in individual impacts. As such, a conservative consequence ranking of Minor (5) has been applied due to the potential for injury or mortality to individual EPBC-listed seabirds and migratory shorebirds.

8.10.2.2 Control measures

Table 8-50 describes the good practice control measures relevant to this aspect.

Table 8-50: Good practice control measures relevant to unplanned disturbance—fauna interaction

Control measure	Description
CM-17: Vessels under transit or on standby within the OA. (cetaceans)	For vessels under transit or on standby within the OA, the following caution and approach zones (and associated vessel speeds) will be implemented: • caution and no approach zones for cetaceans as described in EPBC Regulations 2025 – Part 8 Division 8.1 – Interacting with cetaceans (Cth) • vessels must operate at ≤6 knots within caution zones or when moving away to maintain a no-approach zone or separation distance.
CM-18: Helicopters under	For helicopters under transit within the OA, the following marine fauna interaction requirements will be implemented:

Control measure	Description
transit within the OA.	• height and distance from cetaceans as described in EPBC Regulations 2025 – Part 8 Division 8.1 – Interacting with cetaceans (Cth).

Table 8-51: Additional control measures evaluated for unplanned disturbance—fauna interaction

Control measure	Benefit	Cost
Vessels under transit or on standby within the OA (sharks, marine turtles)	Implementing a separation distance and speed limits for vessels under transit or on standby may reduce the likelihood of an unplanned vessel interaction with sharks and/or marine turtles. The EPBC Act for listed threatened and/or migratory sharks species identified within the OA did not identify vessel disturbance or strike as a threat, except for whale sharks. The C*onservation Advice for the Whale Shark* (Ref. 292) indicates that conservation actions should consider minimising offshore developments and transit time of large vessels in areas close to marine features likely to correlate with whale shark aggregations. The OA does not overlap with these areas, and no BIAs for whale sharks were identified within the OA. The *Recovery Plan for Marine Turtles in Australia* (Ref. 291) identifies vessel disturbance as a key threat; however, no management actions are described. The Recovery Plan also describes that vessel interactions with turtles is generally a concern in shallow coastal areas and where high vessel activity occurs. In addition, the Recovery Plan notes that boat strike (as a standalone threat) has not been shown to cause stock level declines (Ref. 291). Considering the offshore location of the petroleum activity (i.e. ~75 km to the nearest land, and in water depths of >1,100 m), no overlapping with BIAs for whale sharks or marine turtles and as described in Section 8.10.2.1.1, given the water depths and offshore locations, any presence of sharks and marine turtles within the OA (if it occurs) is expected to be of a transitory nature only, the environmental benefit of implementing a separation distance and speed limits for MODU/vessels under transit or on standby in proximity to these species is considered of negligible and would not significantly reduce the residual risk. As such, no further evaluation has been undertaken.	N/A

8.10.2.3 ALARP justification

Offshore drilling and support vessel operations are commonplace and well-practised nationally and internationally. The control measures to manage the risk associated with fauna strike are well defined via legislative requirements that are considered standard industry practice. These are well understood and implemented by the petroleum industry and CAPL.

During relevant persons consultation, no objections or claims were raised regarding disruption to marine fauna arising from the petroleum activity.

Based on the environmental risk evaluation and application of relevant assessment tools as commensurate with the predicted level of risk (e.g. lower-order risks), CAPL considers the adopted good practice control measures (Section 8.10.2.2) are appropriate to manage the potential risks from unplanned interactions with marine fauna. No further reasonably practicable control

measures were identified that would provide a meaningful reduction in environmental risk without incurring grossly disproportionate costs. Accordingly, CAPL considers the potential environmental risks associated with this aspect to be reduced to ALARP.

8.10.2.4 Likelihood and risk level summary

Due to the nature and scale of vessel activities within the scope of this EP, the slow-moving nature of vessels and helicopters within the OA, the location of the OA, and the limited spatial area of activities, the likelihood of a vessel, ROV/AUV or helicopter collision with marine fauna is considered low. Based upon previous operating experience in the OA, CAPL considers the likelihood and residual risk as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Injury or mortality of maring fauna			
Marine mammals	Minor (5)	Remote (5)	Very Low (9)
Marine reptiles	Minor (5)	Remote (5)	Very Low (9)
Fishes, including sharks and rays	Minor (5)	Remote (5)	Very Low (9)
Seabirds and migratory shorebirds	Minor (5)	Remote (5)	Very Low (9)

8.10.3 Demonstration of acceptability

Table 8-52 describes the demonstration of acceptability relevant to this aspect.

Table 8-52: Demonstration of acceptability relevant to unplanned disturbance—fauna interaction

Comparison with acceptable level
Acceptable level AL-19 is applicable to unplanned disturbance–fauna interaction associated with the petroleum activity (refer to Section 6.7). Fauna interaction has been assessed as having a Minor (5) consequence (Section 8.10.2.1), where any predicted impact is not expected to have a detrimental effect on the overall population (i.e. at a local or regional scale). By adopting and implementing preventative control measures (Section 8.10.2.2), the likelihood of unplanned interactions with marine fauna is reduced to ALARP. Consequently, this preventative approach ensures the acceptable level AL-19 is met.
Principles of ESD
Precautionary Principle In accordance with Table 6-2, a consequence level of Minor (5) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level of Minor (5) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required. *Biodiversity Principle* The risks associated with fauna interaction are expected to be limited. If a fauna strike occurred and resulted in mortality, it is not expected to result in effects at a population level that would prevent their long-term recovery or survival. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity.
Relevant environmental legislation and other requirements
Legislation and other requirements considered relevant for this aspect include: • EPBC Regulations 2025 – Part 8 Division 8.1 interacting with cetaceans

- *Conservation Management Plan for the Blue Whale 2015–2025 (*Ref. 52)
- *Conservation Advice Balaenoptera physalus fin whale* (Ref. 282)
- *Conservation Advice Balaenoptera borealis sei whale* (Ref. 283)
- *Conservation Advice for Sousa sahulensis Australian humpback dolphin* (Ref. 284)
- *Conservation Advice for Orcaella heinsohni Australian snubfin dolphin* (Ref. 285)
- *Recovery Plan for Marine Turtles in Australia* (Ref. 291)
- *Conservation Advice for Leatherback Turtle* (Ref. 408)
- *Conservation advice for the whale shark* (Ref. 292)
- *Wildlife Conservation Plan for Seabirds* (Ref. 80)
- *National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna* (Ref. 299).

CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:

Requirement	Demonstration
EPBC Regulations 2025 – Part 8 Division 8.1 interacting with cetaceans Caution and no approach zones for interacting with cetaceans from vessels	Requirements of Regulation 8.05 and 8.06 for vessels and 8.07 for helicopters interacting with cetaceans has been incorporated into the **Marine fauna caution and no approach zones** control measure
Conservation Management Plan for the Blue Whale 2015–2025 Management Action A.4.2: Ensure all vessel strike incidents are reported in the National Ship Strike Database. Management Action A.4.3: 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	Requirements to report vessel strike incidents are included in Section 10.6.2. Section 8.10.2 provides a risk evaluation for vessel strikes on blue whales, and control measures have been identified. Therefore, this activity is not considered to be inconsistent with the *Conservation Management Plan for the Blue Whale*
Conservation Advice Balaenoptera physalus fin whale Conservation action: Ensure all vessel strike incidents are reported in the National Ship Strike Database	Requirements to report vessel strike incidents are included in Section 10.6.2. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice Balaenoptera physalus fin whale*
Conservation Advice Balaenoptera borealis sei whale Conservation action: Ensure all vessel strike incidents are reported in the National Ship Strike Database	Requirements to report vessel strike incidents are included in Section 10.6.2 Therefore, this activity is not considered to be inconsistent with the *Conservation Advice Balaenoptera borealis sei whale*
Conservation Advice for Sousa sahulensis Australian humpback dolphin Conservation action: Ensure all vessel strike incidents are reported in the National Ship Strike Database. Conservation action: Ensure the risk of vessel strike on Australian humpback dolphins is considered when assessing actions that increase vessel traffic on areas Australian humpback dolphins occur and, if	Requirements to report vessel strike incidents are included in Section 10.6.2. Section 8.10.2 provides a risk evaluation for vessel strikes on cetaceans, including Australian humpback dolphins, and control measures have been identified. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for Sousa sahulensis Australian humpback dolphin*

required, appropriate mitigation measures are implemented	
Conservation Advice for Orcaella heinsohni Australian snubfin dolphin Conservation action: Ensure all vessel strike incidents are reported in the National Ship Strike Database. Conservation action: Ensure the risk of vessel strike on Australian snubfin dolphins is considered when assessing actions that increase vessel traffic on areas Australian snubfin dolphins occur and, if required, appropriate mitigation measures are implemented	Requirements to report vessel strike incidents are included in Section 10.6.2. Section 8.10.2 provides a risk evaluation for vessel strikes on cetaceans, including Australian snubfin dolphins, and control measures have been identified. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for Orcaella heinsohni Australian snubfin dolphin*
Recovery Plan for Marine Turtles in Australia No specific management action identified	N/A
Conservation Advice for Leatherback Turtle No specific conservation action identified	N/A
Conservation advice for the whale shark Conservation action: Minimise offshore developments and transit time of large vessels in areas close to marine features likely to correlate with whale shark aggregations (Ningaloo Reef, Christmas Island and the Coral Sea) and along the northward migration route that follows the northern Western Australian coastline along the 200 m isobath. Conservation action: Assess the impacts of offshore installations and associated environmental changes (light spill, chronic noise, changed water temperature, localised nutrient levels) on whale sharks and mitigation options for these impacts.	The OA is outside of whale shark aggregation areas (i.e. Ningaloo Reef, Christmas Island and the Coral Sea). It does not intersect with the whale shark BIA extent, nor does overlap the 200 m isobath. Section 8.10.2 provides risk assessment and consideration of control measures for unplanned interaction with marine fauna. Therefore, this activity is not considered to be inconsistent with the *Conservation advice for the whale shark*
Wildlife Conservation Plan for Seabirds *Action 2d:* Ensure all areas of important habitat for seabirds are considered appropriately and consistently in the development assessment process.	The OA overlaps the breeding BIA for wedge-tailed shearwaters. The OA is ~75 km north-east of the Montebello Island and ~93 km north-east of Barrow Islands. As such, it does not intersect with breeding islands or nesting habitat. Section 8.10.2 provides a risk evaluation for unplanned interaction with seabirds. Therefore, this activity is not considered to be inconsistent with the *Wildlife Conservation Plan for Seabirds.*
National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna No specific action identified	N/A
Internal context	
No management processes or procedures were deemed relevant for this aspect.	

External context
During relevant persons consultation, no objections or claims were raised regarding unplanned interaction with marine fauna arising from the petroleum activity.

8.10.4 Environmental performance

Table 8-53 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-53: Environmental performance relevant to unplanned disturbance—fauna interaction

EPO	Control measure	EPS	MC
EPO-34: No death or injury of an EPBC Act listed threatened, migratory, or cetacean species from the petroleum activity within the OA.	**CM-17:** Vessels under transit or on standby within the OA.	**EPS-17:** Vessels under transit[125] or on standby within the OA will implement caution and no approach zones as described in sections 8.05 and 8.06 of the EPBC Regulations 2025 (Cth): • caution zone (300 m either side of whales; 150 m either side of dolphins)–vessels must operate at ≤6 knots within this zone, maximum of three vessels within zone, and vessels should not enter if a calf is present • no approach zone (300 m to the front and rear of whales and 100 m either side; 300 m for whale calves; 150 m to the front and rear of dolphins and 50 m either side)–vessels should not enter this zone, and should not wait in front of the direction of travel of an animal or pod, or follow directly behind.	**MC-17.1:** Induction materials include relevant marine fauna caution and no approach zone requirements. **MC-17.2:** Training records confirm offshore personnel involved in the petroleum activity have completed the induction. **MC-17.3:** Vessel marine fauna sighting records show if cetacean interaction occurred within caution or approach zones, and what mitigation (e.g. divert or slow vessel) measure was implemented.

[125] For safety reasons this control measure is not applied to vessels holding station or with limited manoeuvrability (e.g. during bunkering, etc.) or during emergence situations.

EPO	Control measure	EPS	MC
	CM-18: Helicopters under transit within the OA.	**EPS-18:** Helicopters under transit within the Operational Area will operate in alignment with section 8.07 of the EPBC Regulations 2025 (Cth): • not operate at a height lower than 1,650 feet or within a horizontal radius of 500 m for a cetacean • not approach a cetacean from head on.	**MC-18:** Helicopter records show if marine fauna interaction occurred, and what mitigation (e.g. divert) measure was implemented.

8.11 Unplanned disturbance—Seabed disturbance

8.11.1 Source of aspect

Activities identified as having the potential to result in an unplanned seabed disturbance are:

- dropped objects (e.g. subsea tree) from the MODU, vessels or ROV/AUV during drilling activities.

8.11.2 Environmental risk evaluation

Unplanned seabed disturbance may result in:

- temporary alteration of BCH
- a potential adverse effect to unknown UCH sites and/or artefacts.

8.11.2.1 Consequence evaluation

8.11.2.1.1 Risk: Temporary alteration of BCH

Object loss may occur due to operator error, bad weather events or failure of equipment. The maximum footprint associated with this event is expected to be <0.01 km^2, corresponding to the largest item potentially lost during the drilling campaign (i.e. a subsea tree).

BCH may be altered via physical disturbance or indirectly by the temporary increase in suspended sediment near the seabed, resulting from unplanned seabed disturbance due to object loss.

As described in Section 5.3.1.1, the OA is primarily comprised of smooth seabed with bioturbation and scattered patches of bedforms with bare substrate to the north and north-east of the proposed DC. No epibenthic or infauna were identified (Ref. 33), and the OA does not overlap any KEFs. No site-attached species are expected due to the absence of suitable habitat in the OA (Section 5.3.3.3; Ref. 78).

The potential impacts to BCH as a result of unplanned seabed disturbance would be limited to individual occurrences and short-term localised impacts (i.e. area of impact limited to the size of dropped object or equipment). Thus, CAPL ranked this consequence as Incidental (6).

8.11.2.1.2 Risk: Potential adverse effect to unknown UCH sites and/or artefacts

During the petroleum activity, discovery of, and unintended disturbance to, an unknown UCH artefact may occur.

Given known sea level history, areas in water depths of <125 m would have been emergent land during the extended history of First Nations occupation of Australia. The OA occurs in water depths >1,100 m. Consequently, the OA would not have been emergent land during the history of First Nations occupation and unknown sites and/or artefacts are not considered credible; consequently, no further assessment has been undertaken.

As identified in Section 5.6.2, there are no known UCH within the OA, and the probability of encountering any historic UCH is low. Consequently, the discovery of, and unintended disturbance to, unknown UCH as a result of unplanned seabed disturbance is not expected. However, should such an event occur, it would be limited to individual occurrences and highly localised impacts (i.e. area of impact limited to the size of dropped object or equipment). Thus, CAPL has assessed potential adverse effect to unknown UCH sites and/or artefacts as Incidental (6).

8.11.2.2 Control measures

Table 8-54 describes the good practice control measures relevant to this aspect.

Table 8-54: Good practice control measures relevant to unplanned disturbance—seabed disturbance

Control measure	Description
CM-33: Lift Plan (or equivalent)	All vessels undertaking complicated, complex, or heavy lifts have a Lifting Procedure (or equivalent) in place that complies with the requirements of the *Control of Work Process* (Ref. 179). The lifting procedure describes the requirements when performing lifting activities.
CM-34: Dropped equipment	In the event of an unplanned loss of equipment, prior to the completion of the activity, the lost equipment will be recovered where considered safe and practicable to do so. Considerations for determining if equipment retrieval is safe and practicable include: • risk to personnel • whether the location of the equipment is in recoverable water depths • equipment's proximity to subsea infrastructure • ability to recover the equipment (e.g. nature of equipment, lifting equipment, suitable weather, etc.)
CM-10: UCH Procedure	The *Inadvertent Underwater Cultural Heritage Discovery Procedures* (Ref. 214) has been developed in alignment with the *Guidelines for Assessing and Managing Impacts to Underwater Cultural Heritage in Australian Water* (Ref. 9). The UCH Procedure (Ref. 214) will be implemented where there are activities interacting with the seabed with the risk of disturbing unlocated UCH. The UCH Procedure (Ref. 214) ensures that inadvertent discoveries of UCH (including First Nations UCH) are identified on site and responded to with adequate conservation and management actions.

Control measure	Description
	The Procedure will identify actions to be taken should potential UCH be identified within the OA.

8.11.2.3 ALARP justification

Vessel operations are routinely undertaken across the offshore petroleum industry, both nationally and internationally. The potential risks associated with unplanned seabed disturbance from these types of activities are managed through control measures prescribed by applicable legislation and/or recognised as standard industry practice. These requirements are well understood and implemented by the petroleum industry, including by CAPL. During relevant persons consultation, no objections or claims were raised regarding unplanned seabed disturbance arising from the petroleum activity.

Based on the environmental risk evaluation and application of relevant assessment tools as commensurate with the predicted level of risk (e.g. lower-order risks), CAPL considers the adopted good practice control measures (Section 8.11.2.2) are appropriate to manage the potential risks from unplanned seabed disturbance. No additional reasonably practicable control measures were identified that would provide a meaningful reduction in environmental risk. Accordingly, CAPL considers the potential environmental risks associated with this aspect to be reduced to ALARP.

8.11.2.4 Likelihood and risk level summary

Loss of equipment has occurred previously in the industry but is not considered likely to occur during these activities, given the control measures in place. As such, CAPL has assessed the likelihood and residual risk level as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Temporary alteration of BCH			
BCH	Incidental (6)	Unlikely (4)	Very Low (9)
Potential adverse effect to unknown UCH sites and/or artefacts			
Unknown UCH sites and/or artefacts	Incidental (6)	Unlikely (4)	Very Low (9)

8.11.3 Demonstration of acceptability

Table 8-55 describes the demonstration of acceptability relevant to this aspect.

Table 8-55: Demonstration of acceptability relevant to unplanned disturbance—seabed disturbance

Comparison with acceptable level
Acceptable level AL-21 is applicable to unplanned disturbance–seabed disturbance associated with the petroleum activity (refer to Section 6.7). Unplanned seabed disturbance, if it were to occur, has been assessed as having an Incidental (6) consequence (Section 8.11.2.1), with any predicted impact expected to be limited to individual occurrences. By adopting and implementing preventative control measures (Section 8.11.2.2), the risk of unplanned disturbance is reduced to ALARP. Consequently, this preventative approach ensures the acceptable level AL-21 is met.
Principles of ESD
Precautionary Principle

In accordance with Table 6-2, a consequence level of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level of Incidental (6) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required. *Biodiversity Principle* The risks associated with this aspect include localised and short-term seabed disturbance, which is not expected to represent a threat of serious or irreversible environmental damage. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity.
Relevant environmental legislation and other requirements
No legislation or other requirements were considered relevant to this aspect.

Requirement	Demonstration
N/A	N/A

Internal context
These management processes or procedures were deemed relevant for this aspect: • *Control of Work Process* (Ref. 179) Control measures related to the above management process have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.
External context
During relevant persons consultation, no objections or claims were raised regarding unplanned seabed disturbance arising from the petroleum activity.

8.11.4 Environmental performance

Table 8-56 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-56: Environmental performance relevant to unplanned disturbance—seabed disturbance

EPO	Control measure	EPS	MC
EPO-36: No unplanned release of solid objects to the environment attributable to the petroleum activity.	**CM-33:** Lift Plan (or equivalent)	**EPS-33:** Where required under the CoW process, develop and implement a Lift Plan (or equivalent) for the petroleum activity	**MC-33:** Records confirm that a Lift Plan (or equivalent) is in place prior to complicated, complex, or heavy lifts being undertaken.
	CM-34: Dropped equipment	**EPS-34:** Dropped equipment will be retrieved wherever practicable within operational and safety constraints.	**MC-34:** Records show that, where assessed as safe and practicable, the lost equipment has been retrieved.
	CM-10: UCH Procedure	**EPS-10.1:** Implement CAPL's *Inadvertent Underwater Cultural Heritage Discovery Procedures* (Ref. 214), including processes for notification and response to	**MC-10.1.1:** Induction materials include relevant UCH requirements.
			MC-10.1.2: Records show if UCH (or potential UCH) were identified within the

EPO	Control measure	EPS	MC
		suspected discoveries.	OA, conservation and management actions were implemented.
		EPS-10.2: Discovery of suspected UCH is reported to the Minister within 21 days of discovery as per section 40 of the UCH Act 2018 (Cth).	**MC-10.2:** Record of lodgement of notification to relevant agency, if suspected UCH was discovered.
		EPS-10.3: If First Nations UCH (or potential UCH) is identified during the petroleum activity, the finding will be shared with the relevant First Nations representative bodies.	**MC-10.3:** Relevant persons consultation records confirm that information has been shared with First Nations representative bodies.

8.12 Non-indigenous species—Introduction of invasive marine pests

8.12.1 Source of aspect

Activities identified as having the potential to result in the introduction of invasive marine pests (IMP) include:

- planned discharged of ballast water or the presence of biofouling on MODU and vessels undertaking activities within the OA
- presence of biofouling on subsea equipment used within the OA.

8.12.2 Environmental risk evaluation

A potential introduction and establishment of an IMP may subsequently result in:

- alteration to BCH.

8.12.2.1 Consequence evaluation

Section 8.11.2 of the NOPSEMA-accepted Gorgon Backfill Fields Development OPP provides an evaluation of potential impacts from introduction of IMP to BCH. As this petroleum activity forms part of the Backfill Fields Development (the offshore project), the potential introduction and establishment of an IMP are of a similar (or smaller) nature and scale, and the relevant receptor[126] (BCH) has been previously assessed, the consequence evaluation for this EP is considered covered by consequence evaluation within Section 8.11.2 of the OPP. In accordance with regulation 56(1) of the OPGGS(E)R, as this information has been previously supplied and is publicly available[127] it is not repeated here.

[126] Given the location of the OA, potential risks from introduction of IMP to KEFs and cultural heritage values were not considered credible for this petroleum activity.

[127] The NOPSEMA-accepted Gorgon Backfill Fields Development OPP is available online at: https://docs.nopsema.gov.au/A1265361. Section 8.11.2 of the Gorgon Backfill Fields Development OPP provides the consequence evaluation of the potential introduction and establishment of an IMP that may subsequently result in effects to BCH.

Consistent with information presented in the OPP, the risk consequence of a potential introduction and establishment of an IMP that may subsequently result in effects to BCH was assessed as Major (3). However, to align with updates to *Chevron's Integrated Risk Prioritization Matrix* (Table 6-2), the consequence rating for this petroleum activity has been conservatively assessed as Severe (2).

8.12.2.2 Control measures

Table 8-57 and Table 8-58 describe the control measures relevant to this aspect.

Table 8-57: Good practice control measures relevant to non-indigenous species—introduction of invasive marine pests

Control measure	Description
CM-35: Quarantine procedure	CAPL's *Quarantine Procedure Marine Vessels* (Ref. 185) provides information about quarantine compliance to CAPL, contractors, and others associated with marine vessels. The procedure also ensures that the requirements of various legislative or relevant guidelines are met, including: • ballast water management in line with the *Australian Ballast Water Management Requirements* (Ref. 10) • undertaking biofouling risk assessments in line with the with the *National Biofouling Management Guidance for the Petroleum Production and Exploration Industry* (Ref. 16) and DPIRD Vessel Check system • requirements for biofouling management plans and/or biofouling record books, in accordance with the *Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species (Biofouling Guidelines*) (Ref. 12) and *Australian Biofouling Management Requirements* (Ref. 11). As described in Section 10.3.3.2, all vessels operating in title areas must comply with applicable Australian biofouling and ballast water requirements to prevent the introduction and spread of marine pests. The quarantine procedure requires that all vessels complete and submit to CAPL a Quarantine Questionnaire – Marine Vessels, of which Section 3 addresses ballast water and Section 4 addresses biofouling, including that all relevant biofouling information (e.g. Biofouling Management Plan, Biofouling Record Book, evidence of last vessel clean to remove biofouling. Antifouling certificates, etc.) is provided to enable suitable risk assessments to be completed prior to vessel mobilisation to a title area. Once CAPL is satisfied that the vessel meets marine quarantine requirements, CAPL will issue authorization to mobilise via the Quarantine Certificate – Vessel Mobilisation
CM-36: Ballast water management	The *Australian Ballast Water Management Requirements* (Ref. 10) describes the management requirements for ballast water exchange, including: • non-discharge of 'high-risk' ballast water in Australian ports or waters • full ballast exchange outside Australian territorial seas • documentation of all ballast exchange activities
CM-37: Maritime Arrivals Reporting System (MARS)	Under the *Biosecurity Act 2015* (Cth), pre-arrival information must be reported through MARS before a vessel arrives in Australian waters. In accordance with the *Australian Biofouling Management Requirements* (Ref. 11) all operators of vessels intending to enter Australian territorial waters must also provide information relating to biofouling management as part of the pre-arrival reporting via MARS
CM-38: Marine Order 98	The *Protection of the Sea (Harmful Anti-fouling Systems) Act 2006* (Cth) enacts Marine Order 98—Marine pollution—anti-fouling systems which sets out the requirements for when an anti-fouling certificate is required.

Control measure	Description
	Marine vessels greater than 400 GT with an anti-foul coating are to maintain up-to-date international antifouling coating certification in accordance with *Protection of the Sea (Harmful Anti-fouling Systems) Act 2006* (Cth) and/or the International Convention on the Control of Harmful Anti-fouling Systems on Ships

Table 8-58: Additional control measures evaluated for non-indigenous species—introduction of invasive marine pests

Control measure	Benefit	Cost
Use locally sourced vessels and equipment	The use of locally sourced vessels and equipment may reduce the likelihood of introducing IMPs from international locations. However, it does not eliminate the risk of introducing species that are native to Australia but non-native to the NWMR, nor species that have established populations elsewhere in Australia. In addition, all contracted vessels are required to undergo IMP risk assessment and implement ballast water and biofouling management measures in accordance with regulatory requirements, regardless of origin. While the use of locally sourced vessels and equipment may reduce exposure to international sources of marine pests, the existing IMP controls applied to all vessels ensure that only vessels presenting an acceptably low IMP risk are mobilised to the OA. As such, no reduction in residual risk would be gained through the use of locally sourced vessels and equipment.	Restricting vessel and equipment selection to locally sourced providers may reduce vessel availability and flexibility, potentially resulting in scheduling delays and increased project costs. Given the negligible environmental benefit, the cost and operational constraints of implementing this control measure are considered grossly disproportionate. Therefore, this control has not been adopted for use.

8.12.2.3 ALARP justification

Vessel operations are routinely undertaken across the offshore petroleum industry, both nationally and internationally. The potential risks associated with an unplanned introduction of an IMP from these types of activities are managed through established control measures prescribed by applicable legislation and/or recognised as standard industry practice. These requirements are well understood and implemented by the petroleum industry, including by CAPL.

During relevant persons consultation, no objections or claims were raised regarding introduction of IMPs arising from the petroleum activity.

Based on the environmental risk evaluation and application of relevant assessment tools as commensurate with the predicted level of risk (e.g. lower-order risks), CAPL considers the adopted good practice control measures (Section 8.12.2.2) are appropriate to manage the potential risks from unplanned introduction of IMP. No further reasonably practicable control measures were identified that would provide a meaningful reduction in environmental risk without incurring grossly disproportionate costs. Accordingly, CAPL considers the potential environmental risks associated with this aspect to be reduced to ALARP.

8.12.2.4 Likelihood and risk level summary

As MODU and vessel activities are occurring within areas that are unlikely to provide benthic habitat suitable for IMP establishment, and with the well-known and implemented IMP control measures in place, CAPL has assessed the likelihood and residual risk level as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Alteration of BCH			
BCH	Severe (2)	Rare (6)	Low (7)

8.12.3 Demonstration of acceptability

Table 8-59 describes the demonstration of acceptability relevant to this aspect.

Table 8-59: Demonstration of acceptability relevant to non-indigenous species—introduction of invasive marine pests

Comparison with acceptable level
Acceptable level AL-20 is applicable to non-indigenous species–introduction of invasive marine pests associated with the petroleum activity (refer to Section 6.7). By adopting and implementing preventative control measures (Section 8.12.2.2), the risk of introduction and establishment of invasive marine pests is reduced to ALARP. Consequently, this preventative approach ensures the acceptable level AL-20 is met.
Principles of ESD
Precautionary Principle In accordance with Table 6-2, a consequence level of Severe (2) could represent a threat of serious or irreversible environmental damage and therefore further evaluation against the Precautionary Principle is required. There is little uncertainty associated with this aspect as the activities and cause pathways are well known and the activities are well regulated and managed. As such, there is limited scientific uncertainty associated with this aspect; therefore, no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level of Severe (2) could represent a threat of serious or irreversible environmental damage and therefore further evaluation against the Intergenerational Principle is required. However, as previously stated, there is limited scientific uncertainty associated with this aspect; consequently, prevention measures are proposed in line with relevant environmental legislation and other requirements to prevent the introduction of IMPs and to ensure that risks are managed such that the environment is maintained for the benefit of future generations. *Biodiversity Principle* The risks associated with this aspect is a widespread long-term impact to BCH, which are expected to comprise soft sediment communities. The introduction of an IMP to these communities has the potential to affect biological diversity and ecological integrity. However, as previously stated, there is limited scientific uncertainty associated with this aspect. Consequently, prevention measures are proposed in line with relevant environmental legislation and other requirements to prevent the introduction of IMPs and to ensure that risks to biodiversity are managed to ensure the protection and maintenance of benthic ecological values.
Relevant environmental legislation and other requirements
Legislation and other requirements considered relevant for this aspect include: • *Biosecurity Act 2015 (*Cth) • *Protection of the Sea (Harmful Anti-fouling Systems) Act 2006* (Cth) (enacted by Marine Order 98 [Marine pollution – anti-fouling systems]) • *Australian Ballast Water Management Requirements* (Ref. 10*)* • *Australian Biofouling Management Requirements* (Ref. 11*)*

- *Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species (Biofouling Guidelines*) (Ref. 12)
- *National Biofouling Management Guidance for the Petroleum Production and Exploration Industry* (Ref. 16).

CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:

Requirement	Demonstration
Biosecurity Act 2015 (Cth) Pre-arrival reporting through MARS	Requirement for pre-arrival reporting has been incorporated into the **MARS** control measure
Protection of the Sea (Harmful Anti-fouling Systems) Act 2006 (Cth) Gives effect to Marine Order 98	Anti-fouling certifications (as per Division 2) have been incorporated into the **Marine Order 98**control measure
Australian Ballast Water Management Requirements Best practice guidance for ballast water management within Australian seas, including legislative obligations under *Biosecurity Act 2015* (Cth)	Requirement for ballast water exchange has been incorporated into the **ballast water management** control measure. Proactive management of ballast water (e.g. use of ballast water management plan) has been incorporated into the **quarantine procedure** control measure
Australian Biofouling Management Requirements Best practice guidance for biofouling management within Australian seas, including legislative obligations under *Biosecurity Act 2015* (Cth)	Requirement for pre-arrival reporting has been incorporated into the **MARS** control measure. Proactive management of biofouling (e.g. use of biofouling management plan) has been incorporated into the **quarantine procedure** control measure
Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species (Biofouling Guidelines) A biofouling management plan and record book to be available and maintained	Proactive management of biofouling (e.g. use of biofouling management plan) has been incorporated into the **quarantine procedure** control measure
National Biofouling Management Guidance for the Petroleum Production and Exploration Industry Undertake a biofouling risk assessment	Biofouling risk assessments for vessels have been incorporated into the **quarantine procedure** control measure
Internal context	
These management processes or procedures were deemed relevant for this aspect: • *Quarantine Procedure Marine Vessels* (Ref. 185). Control measures related to the above management process have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.	
External context	
During relevant persons consultation, no objections or claims were raised regarding IMPs arising from the petroleum activity.	

8.12.4 Environmental performance

Table 8-60 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-60: Environmental performance relevant to non-indigenous species—introduction of invasive marine pests

EPO	Control measure	EPS	MC
EPO-35: No introduction of an invasive marine pest attributable to the petroleum activity.	**CM-35:** Quarantine procedure	**EPS-35:** MODU and vessels undertaking activities in the OA must meet the relevant requirements of CAPL's *Quarantine Procedure Marine Vessels* (Ref. 185), including that, where required: • Quarantine Questionnaire – Marine Vessels has been completed and submitted to CAPL • biofouling risk assessments are completed • biofouling management plans and/or biofouling record books are available.	**MC-35:** The Quarantine Certificate –Vessel Mobilisation issued by CAPL confirm that relevant vessels meet requirements of the *Quarantine Procedure Marine Vessels*.
	CM-36: Ballast water management	**EPS-36:** International marine vessels will be required to comply with the key *Australian Ballast Water Management Requirements* (Ref. 10), which are: • non-discharge of 'high-risk' ballast water in Australian ports or waters • full ballast exchange outside Australian territorial seas • documentation of all ballast exchange activities.	**MC-36:** For international marine MODU and vessels, records show compliance with the *Australian Ballast Water Management Requirements*.
	CM-37: Maritime Arrivals Reporting System (MARS)	**EPS-37:** Vessels entering into the Australian territorial sea from outside Australian territory will complete pre-arrival reporting (unless excepted under Biosecurity Determination 2016),	**MC-37:** Records confirm that international vessels completed pre-arrival reporting (or can demonstrate meeting conditions for an exception).

EPO	Control measure	EPS	MC
		in accordance with the *Biosecurity Act 2015 (*Cth).	
	CM-38: Marine Order 98	**EPS-38:** MODU and vessels operating within the OA will comply with requirements for anti-fouling certificates or anti-fouling declarations (as appropriate to vessel class) within Marine Order 98—Marine pollution—anti-fouling systems.	**MC-38:** Records antifouling coating certifications or declarations, where applicable, are up to date.

8.13 Unplanned release—Solid waste

8.13.1 Source of aspect

Activities identified as having the potential to result in an unplanned release of waste to the environment include:

- inappropriately handled or stored solid waste onboard MODU and vessels operating within the OA during the petroleum activity.

8.13.2 Environmental risk evaluation

Unplanned release of solid waste to the environment may result in:

- injury or mortality of marine fauna.

8.13.2.1 Consequence evaluation

Section 8.12.2 of the NOPSEMA-accepted Gorgon Backfill Fields Development OPP provides an evaluation of potential impacts from unplanned release of solid objects. As this petroleum activity forms part of the Backfill Fields Development (the offshore project), the risk of unplanned release of waste is of a similar (or smaller) nature and scale, and the relevant receptors[128] (marine fauna) are the same as those previously assessed, the consequence evaluation for this EP is considered covered by consequence evaluation within Section 8.12.2 of the OPP. In accordance with regulation 56(1) of the OPGGS(E)R, as this information has been previously supplied and is publicly available[129] it is not repeated here.

Consistent with information presented in the OPP, the risk consequence of injury or mortality of marine fauna was assessed as Incidental (6). However, to align with updates to *Chevron's Integrated Risk Prioritization Matrix* (Table 6-2) a conservative consequence ranking of Minor (5) has been applied due to potential impacts to individuals EPBC listed species.

[128] Given the location of the OA, potential risks from unplanned release of solid waste to KEFs were not considered credible for this petroleum activity. Potential risks from unplanned release of dropped objects to BCH and UCH are assessed in Section 8.11.

[129] The NOPSEMA-accepted Gorgon Backfill Fields Development OPP is available online at: https://docs.nopsema.gov.au/A1265361. Section 8.12.2 of the Gorgon Backfill Fields Development OPP provides the consequence evaluation of the potential impacts from unplanned release of solid waste.

8.13.2.2 Control measures

Table 8-61 describes the good practice control measures relevant to this aspect.

Table 8-61: Good practice control measures relevant to unplanned release—solid waste

Control measure	Description
CM-39: Marine Order 95	Marine Order 95—Marine pollution prevention—garbage gives effect to MARPOL Annex V. MARPOL is the International Convention for the Prevention of Pollution from Ships and is aimed at preventing both accidental pollution, and pollution from routine operations. Specifically, MARPOL Annex V requires: • marine vessels >100 T (or certified to carry >15 persons) will have a Garbage Management Plan on board in accordance with MARPOL 73/78 Annex V • marine vessels >400 T (or certified to carry >15 persons) will have a Garbage Record Book on board in accordance with MARPOL 73/78 Annex V • for waste that is incinerated on board a marine vessel, the incinerator is to be IMO-approved and the waste incinerated is to be recorded in accordance with MARPOL 73/78 Annex V.

8.13.2.3 ALARP justification

MODU and vessel operations are routinely undertaken across the offshore petroleum industry, both nationally and internationally. The potential risks associated with an unplanned release of solid wastes from these types of activities are managed through established control measures prescribed by applicable legislation and recognised as standard industry practice. These requirements are well understood and implemented by the petroleum industry, including by CAPL.

During relevant persons consultation, no objections or claims were raised regarding the unplanned release of waste arising from the petroleum activity.

Based on the environmental risk evaluation and application of relevant assessment tools as commensurate with the predicted level of risk (e.g. lower-order risks), CAPL considers the adopted good practice control measures (Section 8.13.2.2) are appropriate to manage the potential risks from an unplanned release of solid waste. No additional reasonably practicable control measures were identified that would provide a meaningful reduction in environmental risk. Accordingly, CAPL considers the potential environmental risks associated with this aspect to be reduced to ALARP.

8.13.2.4 Likelihood and risk level summary

Marine pollution arising from mismanaged waste offshore has occurred previously in the industry but is not expected to occur during these activities, given the control measures in place. As such, CAPL has assessed the likelihood and residual risk level as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential injury or mortality of marine fauna			
Marine fauna	Minor (5)	Remote (5)	Very Low (9)

8.13.3 Demonstration of acceptability

Table 8-62 describes the demonstration of acceptability relevant to this aspect.

Table 8-62: Demonstration of acceptability relevant to unplanned release—solid waste

Comparison with acceptable level
Acceptable level AL-21 is applicable to unplanned release of waste associated with the petroleum activity (refer to Section 6.7). Unplanned release of waste, if it were to occur, has been assessed as having a Minor (5) consequence (Section 8.13.2.1), where any predicted impact is not expected to have a detrimental effect on the overall population (i.e. at a local or regional scale. By adopting and implementing preventative control measures (Section 8.13.2.2), the risk of unplanned release of waste is reduced to ALARP. Consequently, this preventative approach ensures the acceptable level AL-21 is met.
Principles of ESD
Precautionary Principle In accordance with Table 6-2, a consequence level of Minor (5) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level of Minor (5) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required. *Biodiversity Principle* The potential risks associated with this aspect are expected to be limited. If injury or mortality of marine fauna occur, it would be limited to individuals and is not expected to result in effects at a population level that would prevent their long-term recovery or survival. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity
Relevant environmental legislation and other requirements
Legislation and other requirements considered relevant for this aspect include: • *Marine Order 95* • *MARPOL 73/78* • *Threat Abatement Plan for the Impacts of Marine Debris* on the vertebrate *Wildlife of Australia's Coasts and Oceans* (Ref. 407) • *Conservation Management Plan for the Blue Whale 2015–2025* (Ref. 52) • *Recovery Plan for Marine Turtles in Australia* (Ref. 291) • *Conservation Advice for Leatherback Turtle* (Ref. 408) • *Sawfish and River Sharks Multispecies Recovery Plan* (Ref. 409) • *Conservation advice for the whale shark* (Ref. 292) • *Wildlife Conservation Plan for Seabirds* (Ref. 80) • *National Recovery Plan for Albatrosses and Petrels* (Ref. 409) • *Conservation Advice for Abbott's Booby Papasula abbotti* (Ref. 491). CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:

Requirement	**Demonstration**
Marine Order 95 Gives effect to Annex V of MARPOL 73/78	Requirements for offshore discharge of food from MODU and vessels have been incorporated into the **Marine Order 95** control measure
Threat Abatement Plan for the Impacts of Marine Debris on the vertebrate *Wildlife of Australia's Coasts and Oceans*	N/A

No specific conservation action identified	
Conservation Management Plan for the Blue Whale 2015–2025 No specific conservation action identified	N/A
Recovery Plan for Marine Turtles in Australia *Action A.3.4:* Describe and quantify the impact of ingestion of debris on marine turtles, particularly those life phases using the open ocean. *Action A.3.5:* Support the implementation of the EPBC Act *Threat Abatement Plan for the impacts of marine debris on vertebrate marine life*.	The EPBC management plan requirements to reduce impacts from marine debris. Section 8.13.2 provides a risk evaluation for unplanned release of waste on marine turtles, and control measures have been identified. Therefore, this activity is not considered to be inconsistent with the *Recovery Plan for Marine Turtles in Australia.*
Conservation Advice for Leatherback Turtle No specific conservation action identified	N/A
Sawfish and River Sharks Multispecies Recovery Plan *Action 6a:* Assess the impacts of marine debris including ghost nets, fishing gear and plastics on sawfish and river shark species.	Section 8.13.2 provides a risk evaluation for unplanned release of waste on fishes, including sharks and rays, and control measures have been identified. Therefore, this activity is not considered to be inconsistent with the *Sawfish and River Sharks Multispecies Recovery Plan*
Conservation advice for the whale shark No specific conservation action identified	N/A
Wildlife Conservation Plan for Seabirds *Action 2d:* Ensure all areas of important habitat for seabirds are considered appropriately and consistently in the development assessment process.	The OA overlaps the breeding BIA for wedge-tailed shearwaters. The OA is ~75 km north-east of the Montebello Island and ~93 km north-east of Barrow Islands. As such, it does not intersect with breeding islands or nesting habitat. Section 8.13.2 provides a risk evaluation for unplanned release of waste on seabirds and control measures have been identified. Therefore, this activity is not considered to be inconsistent with the *Wildlife Conservation Plan for Seabirds.*
National Recovery Plan for Albatrosses and Petrels No specific management action identified	N/A
Conservation Advice for Abbott's Booby Papasula abbotti No specific conservation action identified	N/A
Internal context	
No management processes or procedures were deemed relevant for this aspect.	
External context	
During relevant persons consultation, no objections or claims were raised regarding waste management arising from the petroleum activity.	

8.13.4 Environmental performance

Table 8-63 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-63: Environmental performance relevant to unplanned release—solid waste

EPO	Control measure	EPS	MC
EPO-36: No unplanned release of		**EPS-39.1:** Marine vessels >100 T (or	**MC-39.1:** OVIS report, ABU Marine

EPO	Control measure	EPS	MC
solid objects to the environment attributable to the petroleum activity.	**CM-39:** Marine Order 95	certified to carry >15 persons) will have a Garbage Management Plan on board, in accordance with MARPOL 73/78 Annex V.	OE Inspection Checklist, or equivalent record verifies that a Garbage Management Plan is on board marine vessels >100 T or certified to carry >15 persons.
		EPS-39.2: Marine vessels >400 T (or certified to carry >15 persons) will have a Garbage Record Book on board, in accordance with MARPOL 73/78 Annex V.	**MC-39.2:** OVIS report, ABU Marine OE Inspection Checklist, or equivalent record verifies that a Garbage Record Book is on board marine vessels >400 T or certified to carry >15 persons.
		EPS-39.3: For waste that is incinerated on board a marine vessel, the incinerator is to be IMO-approved and the waste incinerated is to be recorded in accordance with MARPOL 73/78 Annex V.	**MC-39.3.1:** OVIS report, ABU Marine OE Inspection Checklist, or equivalent record verifies that current IAPP Certificate (for marine vessels >400 T or certified to carry >15 persons) is in place.
			MC-39.3.1: Inspection (or equivalent) records verify that incinerated waste is recorded within the Garbage Record Book (for marine vessels >400 T or certified to carry >15 persons).

8.14 Unplanned release—Leaks and spills

8.14.1 Source of aspect

The operation of vessels includes handling, using, and transferring hazardous materials, and has the potential to result in leaks or minor spill events. Based on the activities described in this EP, the following potential leaks or minor spills scenarios were identified:

- using, handling, and transferring hazardous materials and chemicals on board (~1 m^3)[130]

[130] A range of hydrocarbons and other hazardous chemicals/materials are likely to be present during onboard the MODU and vessels; however, the maximum credible volume associated with a single-point failure was estimated to be ~1 m^3 based on the loss of an entire intermediate bulk container due to rupture while handling.

- transferring marine fuel or chemicals (e.g. NADF) between MODU and vessels (50 m^3)[131]
- hydraulic line failure from equipment (<1 m^3)
- emergency disconnect (~229 m^3 WBF or NADF)
- slip joint packer failure (~5 m^3 WBF or NADF).

8.14.2 Environmental risk evaluation

Unplanned release of hazardous materials may result in:

- localised and temporary reduction in water quality
- potential adverse effects to marine fauna.

8.14.2.1 Consequence evaluation

8.14.2.1.1 Risk: Localised and temporary reduction in water quality

Leaks and minor spills have the potential to result in a localised and temporary reduction in water quality at the release location.

Upon release, a loss of 50 m^3 of a hazardous product would be expected to result in a localised and short-term change to the water quality within surface waters. Similarly, the environmental impacts of a surface release of ~229 m^3 of drilling fluids are expected to disperse and be less than or comparable to those assessed in Section 8.9, and therefore, are not evaluated further here.

The environmental impacts associated with a surface release of 50 m^3 of MDO are expected to be significantly less than those associated with a vessel collision, and thus are not evaluated further in this section, as this risk is evaluated in Section 8.15.

The remaining leaks or minor spills scenarios are limited to very small (≤5 m^3) releases of hydraulic fluid or other chemicals, which are expected to evaporate quickly or be mixed and diluted due to wave action and local currents. Therefore, any hydrocarbons or chemicals released to the marine environment are expected to be localised and temporary. As such, CAPL has assessed this risk as Incidental (6).

8.14.2.1.2 Risk: Potential adverse effects to marine fauna

As identified in Section 5.3.3, several marine species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the OA. The presence of these species (including marine mammals, reptiles, and pelagic and demersal fishes) are expected to the transitory, with no known aggregation areas within the vicinity of the OA:

Based on the nature of these unplanned releases, which are very small (≤5 m^3), instantaneous and intermittent, the extent and severity of any potential impact is expected to be spatially and temporally limited.

[131] AMSA (Ref. 410) suggests the maximum credible spill volume from a refuelling incident with continuous supervision is the transfer rate × 15 minutes of flow. Assuming failure of dry-break couplings and an assumed 200 m^3/h transfer rate (based on previous operations), this equates to an instantaneous spill volume of ~50 m^3. Assuming the same equipment is used to complete bulk transfers of any bulk liquid (such as NADF), a similar volume (50 m^3) could be expected for an accidental release of drilling fluid during transfer. This is considered conservative because transfer rates are typically slower than the peak transfer rates (described above).

Given the nature of unplanned releases covered under this EP and the transient nature of marine fauna species, fauna would need to pass directly through the plume almost immediately upon release to be impacted. Any potential impact from such an event is expected to be short term and limited to a small number of transient individuals, thus the potential adverse effects to marine fauna arising from chemical toxicity due to unplanned leaks and/or minor spills was determined as Incidental (6).

8.14.2.2 Control measures

Table 8-64 describes the good practice control measures relevant to this aspect.

Table 8-64: Good practice control measures relevant to unplanned release—leaks and spills

Control measure	Description
CM-40: Bulk Transfer Procedure	Bulk transfers of NADF from vessels to MODU will be undertaken in accordance with CAPL's *Wells Fluid Field Guidelines Offshore* (Ref. 411) and the relevant MODU contractor procedure. The requirements include: • Job Safety Analysis (JSA) to be held before all transfers to or from vessels • review and assess the weather forecast, ensuring prevailing and anticipated weather conditions are within capabilities of vessel and working limits • communications established and continuous watch maintained for the duration of transfer.
CM-41: Bunkering Procedure	Transfer of hydrocarbons will be undertaken in accordance with CAPL's *Offshore Cargo Handling Procedure* (Ref. 413) and the relevant vessel contractor procedure. The requirements include: • undertaking a risk assessment before transferring hydrocarbons during darkness • assessing weather conditions prior to cargo operations to confirm conditions are suitable for safe operations.
CM-42: Equipment maintenance	Critical equipment will be identified (e.g. slip joint packers, seals, dry break couplings, hoses) and maintained in accordance with manufacturers specifications. Regular maintenance ensures the integrity of critical equipment is maintained, which ensures optimal performance and reduces the risk of failure.
CM-43: Permit system	CAPL will implement a permit system to control the isolation of overboard drainage aboard the MODU where there is potential for unplanned release of hazardous materials.
CM-44: Riser visual inspection	A riser visual inspection will be conducted weekly (via ROV) following latch up of the BOP to the well. The initial inspection will occur prior to commencement of drilling activities with the riser in place.
CM-45: MARPOL 73/78 (Ship Oil Pollution Emergency Plan [SOPEP] / Shipboard Marine Pollution Emergency Plan)	MARPOL 73/78 Annex I and Marine Order 91—Marine pollution prevention—oil requires that vessels (as appropriate to vessel class) has an approved SOPEP in place. To prepare for a spill event, the SOPEP details: • response equipment available to control a spill event • review cycle to ensure that the SOPEP is kept up to date • testing requirements, including the frequency and nature of these tests. In the event of a spill, the SOPEP details: • reporting requirements and a list of authorities to be contacted

Control measure	Description
	• activities to be undertaken to control the discharge of oil • procedures for coordinating with local officials.

8.14.2.3 ALARP justification

Offshore drilling and vessel operations are commonplace and well-practised nationally and internationally. The control measures to manage the risk associated with leaks or minor spill scenarios from these activities are well defined via legislative requirements that are considered standard industry practice. There is a good understanding of potential spill sources, and the control measures required to manage these are well understood and implemented by the petroleum industry and CAPL.

During relevant persons consultation, a claim was raised regarding the risk of releases of chemicals and hydrocarbons. This claim was responded to by CAPL (see summary in 'external context' [Section 8.14.3] and within Appendix E.

Based on the environmental risk evaluation and application of relevant assessment tools as commensurate with the predicted level of risk (e.g. lower-order risks), CAPL considers the adopted good practice control measures (Section 8.14.2.2) are appropriate to manage the potential risks from an unplanned leak or spill to the marine environment. No additional reasonably practicable control measures were identified that would provide a meaningful reduction in environmental risk. Accordingly, CAPL considers the potential environmental risks associated with this aspect to be reduced to ALARP.

8.14.2.4 Likelihood and risk level summary

With the control measures in place, it was considered very unlikely that a leak or minor spill event associated with this activity would occur, and even more unlikely that such an event would have a potential adverse effects to marine fauna, which are known to be transient and unlikely to be present at the exact location of the leaks or minor spills.

Risk / Receptor	Consequence	Likelihood	Residual risk
Localised and temporary reduction in water quality	Incidental (6)	Remote (5)	Very Low (10)
Potential adverse effects to marine fauna	Incidental (6)	Remote (5)	Very Low (10)

8.14.3 Demonstration of acceptability

Table 8-65 describes the demonstration of acceptability relevant to this aspect.

Table 8-65: Demonstration of acceptability relevant to unplanned release—leaks and spills

Comparison with acceptable level
Acceptable level AL-22 is applicable to unplanned releases–leaks and spills associated with the petroleum activity (refer to Section 6.7). Unplanned release of leaks and spills, if it were to occur, has been assessed as having an Incidental (6) consequence (Section 8.14.2.1), where any predicted impact is not expected to have a detrimental effect on the overall population (i.e. at a local or regional scale. By adopting and implementing preventative control measures (Section 8.14.2.2), the risk of unplanned release of leaks and spills is reduced to ALARP. Consequently, this preventative approach ensures the acceptable level AL-22 is met.

Principles of ESD

Precautionary Principle

In accordance with Table 6-2, a consequence level of Minor (5) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required.

Intergenerational Principle

In accordance with Table 6-2, a consequence level of Minor (5) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required.

Biodiversity Principle

The risks associated with this aspect include localised and short-term toxicity effects to transitory marine fauna, which is not expected to result in effects at a population level that would prevent their long-term recovery or survival. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity

Relevant environmental legislation and other requirements

Legislation and other requirements considered relevant for this aspect include:

- *Marine Order 91—Marine pollution prevention—oil*
- *MARPOL 73/78*
- *Conservation Advice Balaenoptera physalus fin whale* (Ref. 282)
- *Conservation Advice Balaenoptera borealis sei whale* (Ref. 283)
- *Conservation Advice for Sousa sahulensis Australian humpback dolphin* (Ref. 284)
- *Conservation Advice for Orcaella heinsohni Australian snubfin dolphin* (Ref. 285)
- *Recovery Plan for Marine Turtles in Australia* (Ref. 291)
- *Conservation Advice for Leatherback Turtle* (Ref. 408)
- *Conservation advice for the whale shark* (Ref. 292)
- *Sawfish and River Sharks Multispecies Recovery Plan* (Ref. 409)
- *Conservation Advice on Pristis clavate (Dwarf Sawfish)* (Ref. 486)
- *Recovery Plan for the Grey Nurse Shark (Carcharias taurus)* (Ref. 487)
- *Recovery Plan for the White Shark (Carcharodon carcharias)* (Ref. 488)
- *Wildlife Conservation Plan for Seabirds* (Ref. 80)
- *Wildlife Conservation Plan for Migratory Shorebirds* (Ref. 303)
- *National Recovery Plan for albatrosses and petrels* (Ref. 304)
- *National Recovery Plan for (Sternula nereis nereis) (Australian Fairy Tern)* (Ref. 496)
- *Conservation Advice for fairy tern Sternula nereis nereis* (Ref. 495)
- *Conservation Advice for Tringa nebularia (Common Greenshank)* (Ref. 497)
- Conservation Advice for Calidris ferruginea (Curlew Sandpiper) (Ref. 498)
- *Conservation Advice for Numenius madagascariensis (Far Eastern Curlew)* (Ref. 499)
- Conservation Advice for Yakutian bar-tailed Godwit *Limosa lapponica menzbieri* (Ref. 503)
- *Conservation Advice for Calidris canutus (Red Knot)* (Ref. 504)
- *Conservation Advice for Calidris acuminata (Sharp-tailed Sandpiper)* (Ref. 506).

CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:

Requirement	Demonstration
Marine Order 91 Gives effect to Annex I of MARPOL 73/78	Requirements for a vessel to have a SOPEP have been incorporated into the **SOPEP** control measure
Conservation Advice Balaenoptera physalus fin whale No specific conservation action identified	N/A

Conservation Advice Balaenoptera borealis sei whale No specific conservation action identified	N/A
Conservation Advice for Sousa sahulensis Australian humpback dolphin No specific conservation action identified	N/A
Conservation Advice for Orcaella heinsohni Australian snubfin dolphin No specific conservation action identified	N/A
Recovery Plan for Marine Turtles in Australia 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. Note: This is also a specific action identified for the green turtle NWS, loggerhead turtle WA, and flatback turtle Pilbara individual stocks	MODU and vessel are required to have a SOPEP, which include strategies and response programs to respond a spill event. A leak or minor spill is expected to be instantaneous and intermittent within close proximity of the OA. The OA does not overlap any BIA or HCTS of marine turtles. Therefore, this activity is not considered to be inconsistent with the *Recovery Plan for Marine Turtles in Australia*
Conservation Advice for Leatherback Turtle No specific conservation action identified	N/A
Conservation Advice for whale shark Conservation action: Assess the impacts of offshore installations and associated environmental changes (light spill, chronic noise, changed water temperature, localised nutrient levels) on whale sharks and mitigation options for these impacts	Section 8.14.2 provides a risk assessment and consideration of control measures for unplanned releases from a leak or minor spill. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for whale shark*
Sawfish and River Sharks Multispecies Recovery Plan Action 5c: Identify risks to important sawfish and river shark habitat and measures needed to reduce those risks	Section 8.14.2 provides a risk assessment to marine fauna predicted to be impacted from an unplanned leak or minor spill release from the petroleum activity and consideration of control measures has been identified. Therefore, this activity is not considered to be inconsistent with the *Sawfish and River Sharks Multispecies Recovery Plan*
Conservation Advice on Pristis clavate (Dwarf Sawfish) No specific conservation action identified	N/A
Recovery Plan for the Grey Nurse Shark (Carcharias taurus) No specific management action identified	N/A
Recovery Plan for the White Shark (Carcharodon carcharias) No specific conservation action identified	N/A
Wildlife Conservation Plan for Seabirds Action 2h: Enhance contingency plans to prevent and/or respond to environmental emergencies that have an impact on seabirds and their habitats	MODU and vessel are required to have a SOPEP, which include strategies and response programs to respond a spill event. Therefore, this activity is not considered to be inconsistent with the *Wildlife Conservation Plan for Seabirds*

Wildlife Conservation Plan for Migratory Shorebirds Action 3f: Ensure all areas important to migratory shorebirds in Australia continue to be considered in development assessment processes	Section 8.14.2provides a risk assessment to marine fauna predicted to be impacted from an unplanned release from the petroleum activity and consideration of control measures has been identified. Therefore, this activity is not considered to be inconsistent with the *Wildlife Conservation Plan for Migratory Shorebirds*
National Recovery Plan for albatrosses and petrels Action 5c: Risk based response strategies for marine pollution incidents are developed. Action 5b (adapted): Undertake, as feasible, monitoring of breeding colonies for marine pollution impacts, including as a priority: • incidence of oiled birds at nest • effect of marine pollution	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Monitoring, response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *National Recovery Plan for albatrosses and petrels*
National Recovery Plan for (Sternula nereis nereis) (Australian Fairy Tern) No specific management action identified	N/A
Conservation Advice for common greenshank Tringa nebularia No specific conservation action identified	N/A
Conservation Advice for Calidris ferruginea (Curlew Sandpiper) No specific conservation action identified	N/A
Conservation Advice for fairy tern *Sternula nereis nereis* Action: 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 is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for Sternula nereis nereis (Fairy Tern)*
Conservation Advice for Numenius madagascariensis (Far Eastern Curlew) No specific conservation action identified	N/A
Conservation Advice for Yakutian bar-tailed Godwit *Limosa lapponica menzbieri* No specific conservation action identified	N/A
Conservation Advice for Calidris canutus (Red Knot) No specific conservation action identified	N/A
Conservation Advice for Calidris acuminata (Sharp-tailed Sandpiper) No specific conservation action identified	N/A
Internal context	
These management processes or procedures were deemed relevant for this aspect: • *Chevron Shipping's Marine Standard Non Tankers: Corporate OE Standard* (Ref. 180) • CAPL *Well Fluid Field Guidelines Offshore 2020* (Ref. 411).	

Control measures related to the above management process have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.
External context
During relevant persons consultation, a concern was raised regarding potential impacts from marine chemical and hydrocarbon discharges. CAPL provided a response that confirmed: • potential environmental risks from unplanned releases are identified and evaluated within the EP. Control measures have been identified to prevent and/or reduce risks to ALARP. This is considered within the EP in Section 8.15 and Section 8.16. No further objections or claims were raised regarding leaks or minor spill arising from the activity.

8.14.4 Environmental performance

Table 8-66 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-66: Environmental performance relevant to unplanned release—leaks and spills

EPO	Control measure	EPS	MC
EPO-37: No unplanned release of hydrocarbons or chemicals to the environment attributable to the petroleum activity	**CM-40:** Bulk Transfer Procedure	**EPS-40:** Bulk transfers of NADF are implemented in accordance with CAPL's *Wells Fluid Field Guidelines Offshore* (Ref. 411) and the relevant MODU contractor procedure. The requirements include: • JSA to be held before all transfers to or from vessels • review and assess the weather forecast, ensuring prevailing and anticipated weather conditions are within capabilities of vessel and working limits • communications established and continuous watch maintained for the duration of transfer.	**MC-40:** Records confirm that bulk transfers of NADF were conducted in accordance with CAPL's *Wells Fluid Field Guidelines Offshore* and the relevant MODU contractor procedure.
	CM-41: Bunkering Procedure	**EPS-41:** Develop and implement a Bunkering Procedure (or equivalent) for the petroleum activity. The requirements include:	**MC-41:** Records confirm that refuelling was undertaken in accordance with the Bunkering Procedure (or equivalent).

EPO	Control measure	EPS	MC
		• undertaking a risk assessment before transferring hydrocarbons during darkness • assessing weather conditions prior to cargo operations to confirm conditions are suitable for safe operations.	
	CM-42: Equipment maintenance	**EPS-42:** Critical equipment will be identified and maintained in accordance with manufacturers specifications.	**MC-42:** Records confirm critical equipment is maintained in accordance with manufacturer specifications.
	CM-43: Permit system	**EPS-43:** Implement a permit system to control the isolation of overboard drainage aboard the MODU and vessels, where there is potential for unplanned discharge of hazardous materials.	**MC-43:** Where required, records confirm the implementation of a permit system.
	CM-44: Riser visual inspection	**EPS-44:** A riser visual inspection will be conducted weekly (via ROV) following latch up of the BOP to the well. The initial inspection will occur prior to commencement of drilling activities with the riser in place.	**MC-44:** Records confirm riser inspections are conducted.
	CM-45: MARPOL 73/78 (SOPEP)	**EPS-45.1:** Marine vessels (as appropriate to vessel class) will carry on board a Shipboard Oil Pollution Emergency Plan (SOPEP) in accordance with MARPOL 73/78 Annex I – Prevention of Oil Pollution.	**MC-45.1.1:** OVIS report, ABU Marine OE Inspection Checklist, or equivalent record, confirms an approved SOPEP is on board marine vessels >400 T.
			MC-45.1.2: Inspection records (or similar) show drills conducted in accordance with SOPEP.
			MC-45.1.3: Inspection records (or similar) show spill kits

EPO	Control measure	EPS	MC
			available in accordance with SOPEP.
		EPS-45.2: In the event of a vessel-based spill event, emergency response activities will be implemented in accordance with the vessel SOPEP (or equivalent).	**MC-45.2:** Records confirm that emergency response activities were implemented in accordance with the vessel SOPEP in the event of a vessel-based spill.

8.15 Unplanned release—Loss of containment (vessel collision)

8.15.1 Source of aspect

A vessel collision event within the OA is considered a credible (but unlikely) unplanned event. A major marine spill because of vessel collision is only expected to occur under exceptional circumstances (e.g. loss of DP, navigational error, or floundering due to inclement weather conditions). A collision could potentially occur between the MODU/vessels undertaking the petroleum activity and/or third-party vessels. Given the location, water depths, and lack of submerged features within the OA, grounding is not considered credible and is not considered further.

8.15.2 Worst case credible scenario

Based upon the type of MODU/vessels and marine fuels likely to be used during the petroleum activity, CAPL has identified the credible worst-case scenario as being a:

- surface release of ~2,350 m^3 of MDO over 24 hours.

The estimate of spill volume is aligned with AMSA's guidance for maximum credible spill volumes for vessel collisions (Ref. 414). The spill duration is based on industry experience and guidance from RPS.

8.15.3 Oil spill modelling

RPS undertake stochastic and deterministic spill modelling (Ref. 415) to inform the risk assessment associated with a vessel collision event. Table 8-67 provides a summary of the oil spill model settings.

Oil spill modelling was performed using a three-dimensional trajectory and fates model: Spill Impact Mapping and 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 hydrocarbon properties.

Because an oil spill can occur during any set of wind and current conditions, modelling was conducted using a stochastic (random or non-deterministic) approach, which involved running 100 spill simulations per season using random start times and the same spill release information (spill volume, duration, and hydrocarbon composition). This ensured that each stochastic simulation was subject to different wind and current conditions and, in turn, movement and weathering of the hydrocarbon. Stochastic modelling informs that potential EMBA by hydrocarbons from an oil spill event.

Deterministic modelling is predictive modelling based on a single simulation; i.e. it represents of single event under particular environmental conditions (unlike the multiple simulations used to generate the stochastic modelling results). From the 300 stochastic simulations, particular deterministic runs were selected based on 'worst case' spatial extents above exposure values and used to inform the risk assessment.

Table 8-67: Vessel collision credible spill scenario inputs

Parameter	Details
Release Location	G&E DC
Latitude	19° 56' 25.5" S
Longitude	114° 53' 6.7" E
Water Depth	1,220 m
Oil type	MDO
Simulation spill type	Surface
Simulation spill volume	2,350 m^3
Simulation spill duration	24 hours
Total simulation duration	50 days
Number of randomly selected spill simulation start times	100 per season (300 total)
Seasons modelled	Summer (September to the following March) Transitional (April and August) Winter (May to July)

Hydrocarbon properties

MDO is a light persistent fuel oil used in the maritime industry. The physical properties and boiling point distributions for the MDO are presented in Table 8-68.

The low viscosity indicates that this oil will spread quickly when released and will form a thin film on the sea surface, increasing its rate of evaporation (Ref. 415).

Generally, about 6.0% of the MDO mass should evaporate within the first 12 hours (BP <180 °C); a further ~34.6% should evaporate within the first 24 hours (BP 180 °C–265 °C); and an additional ~54.4% should evaporate over several days (BP 265 °C–380 °C). Approximately 5% (by mass) of MDO will not evaporate at atmospheric temperatures, though will decay slowly over time (Ref. 415).

The heavier components of the MDO, specifically the low volatiles and persistent portions, will have a strong tendency to become entrained into the water column in the presence of moderate winds (>10 knots) and in turn breaking waves; however, it can re-surface under calm conditions (<10 knots) (Ref. 415).

Table 8-68: Physical properties and boiling point ranges for MDO

Characteristics	Value
Density	829.1 kg/m^3 at 25 C
Dynamic viscosity	4.0 cP at 25 C

Characteristics	Value			
Pour point	-14 C			
API gravity	37.6			
Classification	Group II, light persistent			
Boiling point (BP)	**Volatile <180°C C_4 to C_{10}**	**Semi-volatile 180–265°C C_{11} to C_{15}**	**Low volatility 265–380°C C_{16} to C_{20}**	**Residual >380°C >C_{20}**
	Non-persistent			**Persistent**
	6.0%	34.6%	54.4%	5.0%

Exposure values

NOPSEMA's *information paper on the Application of oil spill modelling in Environment Plans* (Ref. 23) provides recommended exposure values that should be applied for different purposes to meet the different requirements of the OPGGS(E)R):

- identification of the **EMBA by hydrocarbons** (regulations 21(2) and 21(3)) and the evaluation of consequences of hydrocarbon exposure on all relevant environmental values and sensitivities (regulations 21(5) and (6))
- informing **oil spill response** option selection and **operational and scientific monitoring** arrangements (regulations 22(9) and 22(10)).

Table 8-69 provides the exposure values adopted in this EP to identify the EMBA by hydrocarbons (the 'Hydrocarbon EMBA' in Section 5.1) and to inform the consequence evaluation for this aspect (Section 8.15.4.1). These exposure values are based on the recommended values in Table 1 of NOPSEMA's information paper (Ref. 23).

Note: For exposure values related to oil spill response and operational and scientific monitoring planning refer to Section 9.1.

Table 8-69: Hydrocarbon exposure values

Oil component	Exposure value	Purpose of exposure value*
Shoreline	High (≥1,000 g/m^2)	It represents the concentration of shoreline oil at or above which there is an increased likelihood of consequences on ecological, social, economic, or cultural features of the environment.
	Moderate (≥100 g/m^2)	It represents a lower concentration for identifying ecological features of the EMBA by shoreline oil, and for assessing the potential consequences on these features.
	Low (≥10 g/m^2)	It represents a lower concentration for identifying social, economic, or cultural features of the EMBA by shoreline oil, and for assessing the potential consequences on these features. At this concentration, consequences on ecological features of the environment are generally not expected; however, consequences may occur depending on factors such as the sensitivity of specific features or any management, conservation, or protection objectives for the environment (e.g. marine protected areas, First Nations cultural heritage).
Surface (floating)	High (≥50 g/m^2)	It represents the concentration of surface oil at or above which there is an increased likelihood of consequences on ecological, social, economic, or cultural features of the environment.

Oil component	Exposure value	Purpose of exposure value*
	Moderate (≥10 g/m^2)	It represents a lower concentration for identifying ecological features of the EMBA by floating oil, and for assessing the potential consequences on these features.
	Low (≥1 g/m^2)	It represents a lower concentration for identifying social, economic, or cultural features of the EMBA by surface oil, and for assessing the potential consequences on these features. At this concentration, consequences on ecological features of the environment are generally not expected; however, consequences may occur depending on factors such as the sensitivity of specific features or any management, conservation, or protection objectives of the environment (e.g. marine protected areas, First Nations cultural heritage).
Dissolved	High (≥400 ppb PAH)[132]	It represents a concentration of dissolved oil at or above which there is an increased likelihood of consequences on ecological, social, economic, or cultural features of the environment.
	Moderate (≥50 ppb PAH)	It represents a concentration of dissolved oil at or above which there is an increased likelihood of consequences on ecological, social, economic, or cultural features of the environment.
	Low (≥10 ppb PAH)	It represents a lower concentration for identifying ecological, social, economic and cultural features of the EMBA by dissolved oil, and for assessing the potential consequences on these features.
Entrained	High (≥1,000 ppb THC)	It represents a concentration of entrained oil at or above which there is an increased likelihood of consequences on ecological, social, economic, or cultural features of the environment.
	Moderate (≥100 ppb THC)	It represents a lower concentration for identifying ecological, social, economic, or cultural features of the EMBA by entrained oil, and for assessing the potential consequences on these features. It is a conservative exposure value to account for the uncertainty in consequences on ecological, social, economic, and cultural features of the environment.

** Source: Table 1 from NOPSEMA's information paper on the application of oil spill modelling in EPs (Ref. 23)*

Modelling results

Outcomes of the stochastic modelling undertaken by RPS (Ref. 415) are provided in the following:

- visual representation of areas at risk of exposure to surface, dissolved, entrained, and shoreline accumulated oil at each of the relevant exposure values (Figure 8-2)
- an overall summary of stochastic modelling results (below) and a summary of the maximum predicted exposures and/or concentrations to key individual receptors (Table 8-70).

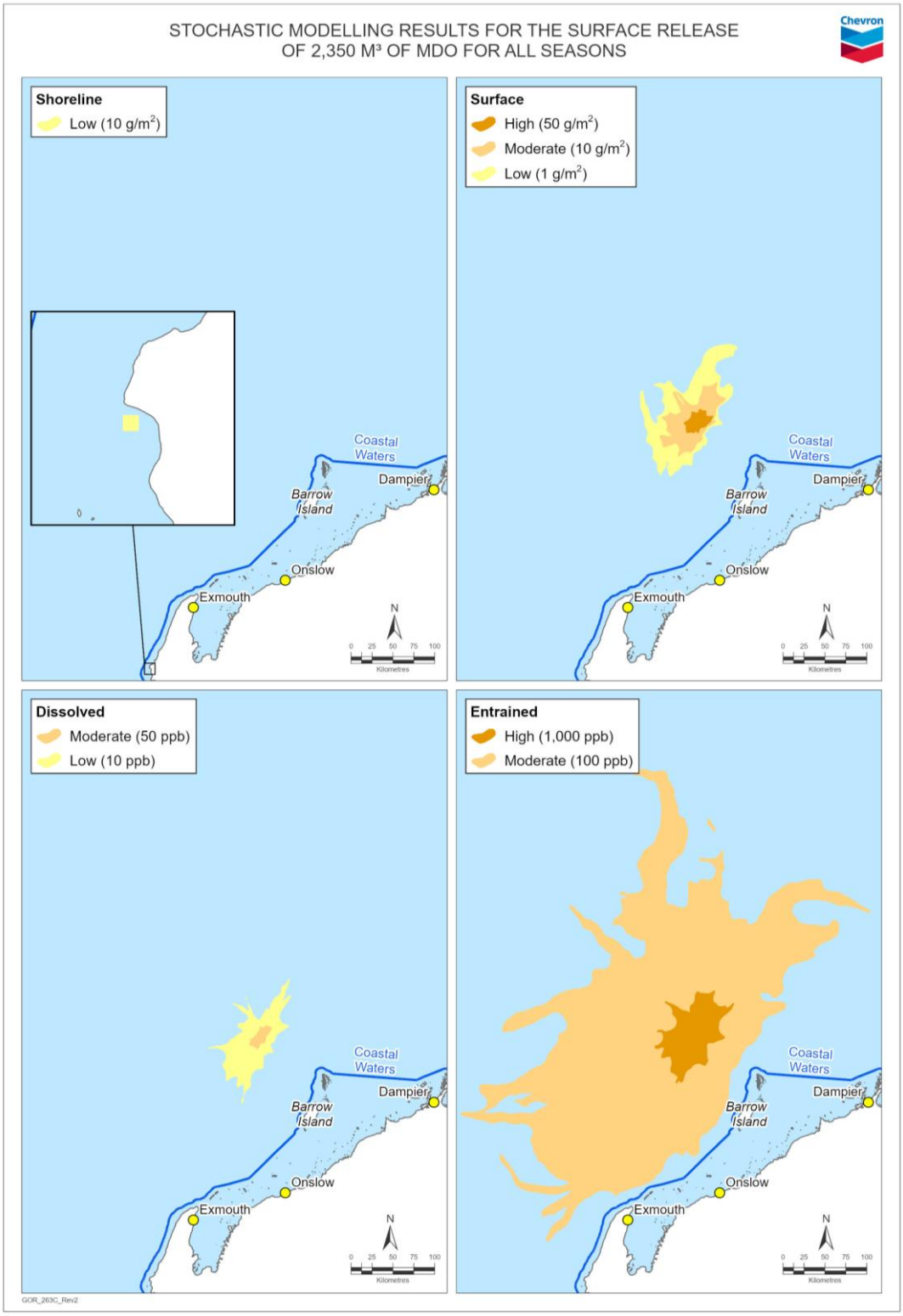
[132] The recommended exposure value in the 2025 NOPSEMA guidance (Ref. 23) use 300 ppb; however, the oil spill modelling for this petroleum activity was undertaken prior to this guidance being released. The previous 2019 NOPSEMA guidance (Ref. 416) used a recommended value of 400 ppb. This high exposure value does not affect the spatial boundary of the Hydrocarbon EMBA, or the area exposed to dissolved oil (as exposure does occur at the low and moderate thresholds), and is therefore still considered appropriate to inform this risk evaluation.

RPS analysed the stochastic modelling results to determine the worst-case deterministic (i.e. single simulation) runs that represented particular criteria (e.g. largest swept area of surface oil). The outcomes from the deterministic modelling analyses are summarised in Table 8-71.

Stochastic modelling outputs from RPS (Ref. 415) are summarised below:

- shoreline
  - shoreline accumulation at the low exposure value (≥10 g/m^2) was predicted during summer only (no other seasons), and only on a small part of the North West Cape (within the Ningaloo); the probability of this shoreline accumulation occurring is 1%.
    - the minimum time before oil accumulated above this exposure value was ~32.4 days, and the maximum total length was 1.0 km
    - the predicted peak volume ashore was 1.6 m^3 occurring ~35 days after release; and the maximum total volume[133] of accumulated shoreline oil was 2.3 m^3.
  - no shoreline accumulation above moderate (≥100 g/m^2) or high (≥1,000 g/m^2) exposure values was predicted for any season.
- surface
  - the maximum distances to the low exposure value (≥1 g/m^2) ranged between 69.4 km (summer) to 100.1 km (transitional)
  - the maximum distances to the moderate exposure value (≥10 g/m^2) ranged between 45.6 km (summer) and 51.5 km (transitional)
  - the maximum distances to the high exposure value (≥50 g/m^2) remained within 17.4 km from the release location.
  - no surface exposure above the low (1 g/m^2) exposure value was predicted in State waters during any season.
- dissolved
  - dissolved oil above the low (≥10 ppb) and moderate (≥50 ppb) exposure values was predicted to occur during all three seasons; no dissolved oil above the high (≥400 ppb) exposure value was predicted to occur
  - no dissolved oil above any exposure value was predicted in State waters.
- entrained
  - entrained oil at the moderate (≥100 ppb) and high (≥1,000 ppb) exposure values was predicted to occur during all three seasons
  - the probability of the Gascoyne and Montebello AMPs being exposed to entrained oil at ≥100 ppb was 5–11% and 0–2% respectively
  - neither AMP was predicted to be exposed to entrained oil at the high (≥1,000 ppb) exposure value
  - no entrained oil above these exposure values was predicted in State waters.

[133] Total volume of oil stranded on shorelines over the entire simulation, not accounting for natural removal processes such as evaporation and decay (Ref. 415).



Note: Exposure values not presented in the figure were not predicted.

Figure 8-2: Zones of potential exposure to surface, dissolved, entrained, and shoreline accumulated oil based on 300 simulations for a 2,350 m³ surface release of MDO

Table 8-70: Maximum predicted probability of exposure[134] and/or concentrations (from any season) to individual receptors based on stochastic modelling of 2,350 m³ surface release of MDO

Value or sensitivity (Receptor)	Surface oil			Dissolved oil				Entrained oil			Shoreline accumulated oil			
	Maximum probability (%) of exposure			Maximum concentration (ppb)	Maximum probability (%) of exposure			Maximum concentration (ppb)	Maximum probability (%) of exposure		Maximum accumulated concentration (g/m²)	Maximum probability (%) of exposure		
	≥1 g/m²	≥10 g/m²	≥50 g/m²		≥10 ppb	≥50 ppb	≥300 ppb		≥100 ppb	≥1,000 ppb		≥10 g/m²	≥100 g/m²	≥1,000 g/m²
Australian Marine Parks														
Gascoyne	–	–	–	–	–	–	–	262.3	11	–	N/A			
Montebello	–	–	–	–	–	–	–	201.3	2	–	N/A			
State marine protected areas														
No state marine protected areas are predicted to be exposed to oil above the relevant Hydrocarbon EMBA exposure values (see Table 8-69)[135].											N/A			
KEFs														
Ancient coastline at 125 m depth contour	–	–	–	–	–	–	–	693.6	NIE (SB)	–	N/A			
Canyons linking the Cuvier Abyssal Plan and the Cape Range Peninsula	–	–	–	–	–	–	–	229.7	NIE (SB)	–	N/A			
Continental slope demersal fish communities	NIE (NSB)	NIE (NSB)	–	24	NIE (NSB)	–	–	1,998.9	NIE (NSB)	NIE (NSB)	N/A			
Exmouth Plateau	NIE (SB)	–	–	–	–	–	–	858.9	NIE (SB)	–	N/A			
Reefs, banks, and shoals														
Rankin Bank	–	–	–	–	–	–	–	112	NIE (SB)	–	N/A			
BIAs for protected marine fauna														
Humpback whale	–	–	–	–	–	–	–	533.3	32	–	N/A			
Pygmy blue whale	100	100	84	149	92	59	–	24,030.2	100	100	N/A			
Flatback turtle	–	–	–	–	–	–	–	1.401.0	14	1	N/A			
Green turtle	–	–	–	–	–	–	–	236.6	2	–	N/A			
Hawksbill turtle	–	–	–	–	–	–	–	192.4	2	–	N/A			
Loggerhead turtle	–	–	–	–	–	–	–	229.7	2	–	N/A			
Whale shark	–	–	–	–	–	–	–	1,259.8	14	1	N/A			
Lesser crested tern	–	–	–	–	–	–	–	127.4	1	–	N/A			
Wedge-tailed shearwater	100	100	84	149	91	59	–	24,030.2	100	97	N/A			
HCTS of marine turtles														
Flatback turtle	1	–	–	–	–	–	–	1,411.3	28	1	N/A			
Green turtle	–	–	–	–	–	–	–	189.9	2	–	N/A			
Hawksbill turtle	–	–	–	–	–	–	–	189.9	2	–	N/A			

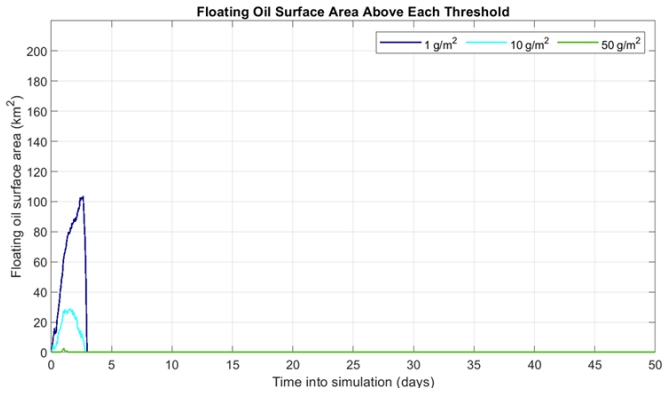
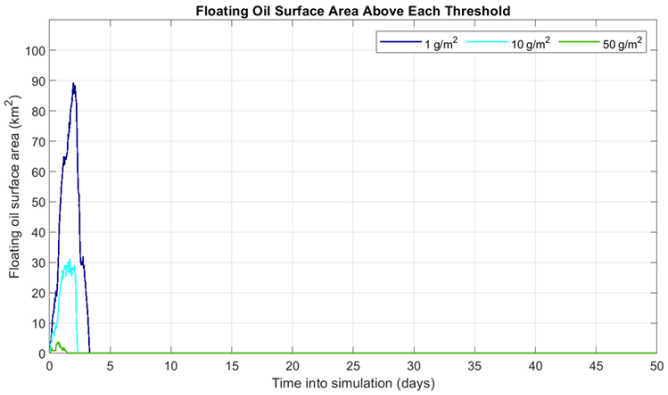
[134] Where – = no contact predicted, NIE (SB) = spatial overlap based on plan view, but no interaction expected as value or sensitivity is a seabed based receptor; NIE (NSB) = spatial overlap based on plan view, but no interaction expected as value or sensitivity is a near-seabed based receptor), N/A = not applicable.

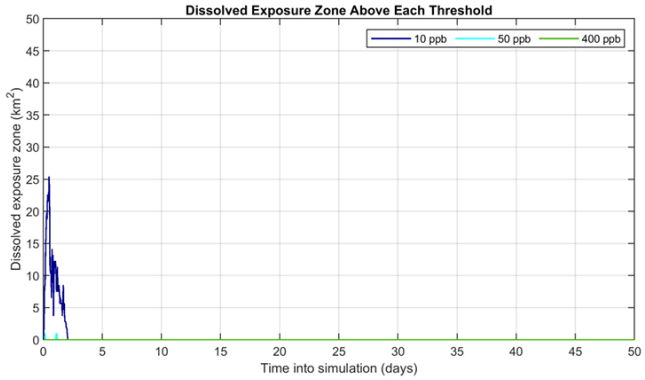
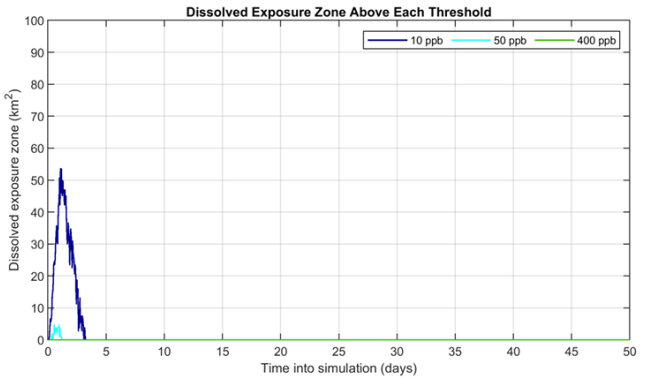
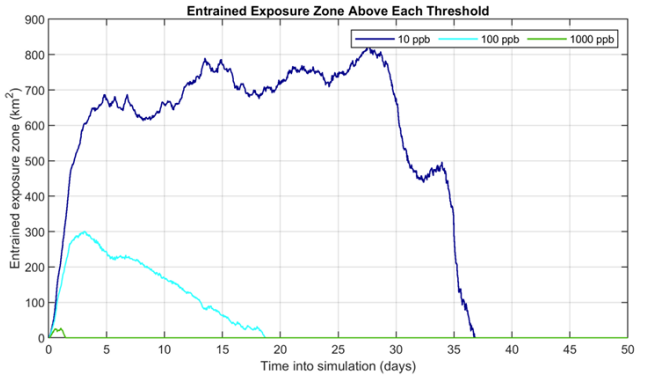
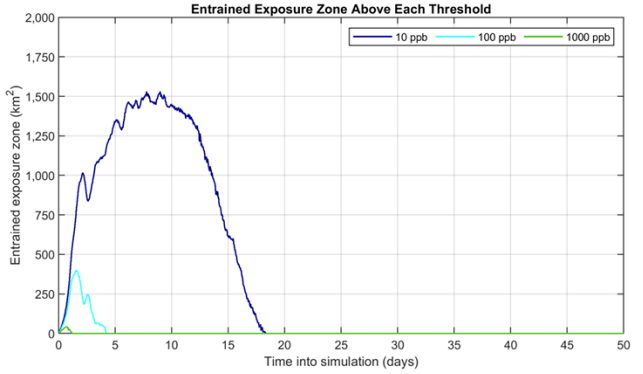
[135] The Hydrocarbon EMBA defined in Section 5.1 is based on a smoothed outer boundary to provide a conservative approach to identifying and describing environmental values and sensitivities. Section 5.5.2 and Figure 5-12 show the Hydrocarbon EMBA extending into several state marine parks protected areas. The stochastic modelling for this spill scenario (2,350 m³ surface release of MDO) does not predict exposure to any state marine parks protected areas occurring at or above the relevant exposure values for the Hydrocarbon EMBA (Table 8-69). The stochastic modelling did predict exposure at the low (≥10 ppb) entrained exposure value; this exposure value is associated with the planning area for operational and scientific monitoring as described in Section 9.

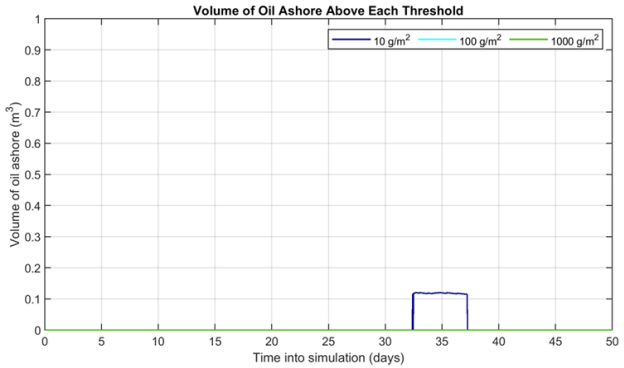
Value or sensitivity (Receptor)	Surface oil			Dissolved oil				Entrained oil			Shoreline accumulated oil			
	Maximum probability (%) of exposure			Maximum concentration (ppb)	Maximum probability (%) of exposure			Maximum concentration (ppb)	Maximum probability (%) of exposure		Maximum accumulated concentration (g/m^2)	Maximum probability (%) of exposure		
	≥1 g/m^2	≥10 g/m^2	≥50 g/m^2		≥10 ppb	≥50 ppb	≥300 ppb		≥100 ppb	≥1,000 ppb		≥10 g/m^2	≥100 g/m^2	≥1,000 g/m^2
World Heritage property														
No World Heritage listed properties were identified within the Hydrocarbon EMBA (Section 5.6)[136].											N/A			
National Heritage place														
No National Heritage listed places were identified within the Hydrocarbon EMBA (Section 5.6)[136].											N/A			
Commonwealth Heritage place														
No Commonwealth Heritage listed places were identified within the Hydrocarbon EMBA (Section 5.6)[136].											N/A			
State waters														
WA State waters are not within the spatial extents predicted to potentially be exposed to oil above the relevant Hydrocarbon EMBA exposure values (see Table 8-69).											N/A			
Shorelines														
WAMOPRA Shoreline Cell 126	N/A										10.5	1	–	–

[136] The Hydrocarbon EMBA defined in Section 5.1 is based on a smoothed outer boundary to provide a conservative approach to identifying and describing environmental values and sensitivities. Section 5.6 shows the Hydrocarbon EMBA extending into The Ningaloo Coast World Heritage property, National and Commonwealth Heritage places, and the Learmonth Air Weapons Rage Facility Commonwealth Heritage place. The stochastic modelling for this spill scenario (2,350 m^3 surface release of MDO) does not predict exposure to any Heritage protected property or place occurring at or above the relevant exposure values for the Hydrocarbon EMBA (Table 8-69). The stochastic modelling did predict exposure at the low (≥10 ppb) entrained exposure value; this exposure value is associated with the planning area for operational and scientific monitoring as described in Section 9.

Table 8-71: Summary of deterministic modelling analyses for surface, dissolved, entrained, and shoreline accumulated oil based on a 2,350 m³ surface release of MDO

Variable	Deterministic scenario	
Surface oil	**Largest swept area of surface oil ≥10 g/m²**	**Largest swept area of surface oil ≥50 g/m²**
Season	Winter	Transitional
Peak volume (m^3) of surface oil and day of occurrence	944.6 (Day 1)	1067.1 (Day 1)
Volume (m^3) of surface oil at end of simulation (Day 50)	0.0	<0.1
Predicted area of surface oil above each exposure value *Image source: RPS (Ref. 415)*		
Dissolved oil	**Largest area of dissolved oil ≥10 ppb**	**Largest area of dissolved oil ≥50 ppb**
Season	Summer	Winter
Peak volume (m^3) of dissolved oil and day of occurrence	13.8 (Day 2)	20.8 (Day 2)
Volume (m^3) of dissolved oil at end of simulation (Day 50)	0.1	0.2

Variable	Deterministic scenario	
Predicted area of dissolved oil above each exposure value *Image source: RPS (Ref. 415)*		
Entrained oil	**Largest area of entrained oil ≥100 ppb**	**Largest area of entrained oil ≥1,000 ppb**
Season	Transitional	Transitional
Peak volume (m^3) of entrained oil and day of occurrence	1,363.9 (Day 2)	1,744.6 (Day 2)
Volume (m^3) of entrained oil at end of simulation (Day 50)	174.4	122.8
Predicted area of entrained oil at each exposure value *Image source: RPS (Ref. 415)*		

Variable	Deterministic scenario	
Shoreline accumulated oil	**Largest (total) volume of shoreline oil accumulation**	**Longest length of shoreline oil accumulation ≥100 g/m²**
Season	Summer	N/A (No shoreline accumulation ≥100 g/m² during any season).
Peak volume (m^3) of shoreline oil and day of occurrence	1.6 (Day 35)	
Volume (m^3) of shoreline oil at end of simulation (Day 50)	1.1	
Predicted volume of shoreline accumulation above each exposure value *Image source: RPS (Ref. 415)*		

8.15.4 Environmental risk evaluation

Unplanned release of MDO due to a vessel collision event may result in:

- change in water quality
- potential adverse effects to BCH
- potential adverse effects to marine fauna
- potential changes to the functions, interests and activities of other marine users
- potential changes to values and sensitivities of protected areas
- potential changes to tangible cultural heritage values.

8.15.4.1 Consequence evaluation

8.15.4.1.1 Risk: Change in water quality

An unplanned release of hydrocarbon from a vessel collision may result in a reduction in water quality in offshore waters extending from the release location.

Impacts to water quality are expected to be short-term, consistent with the typical weathering properties of MDO. Following release to the marine environment, MDO spreads quickly and evaporates rapidly when exposed to air, up ~95% may evaporate over several days depending on wind and wave conditions affecting how much is entrainment into the water column (Section 8.15.3; Ref. 415).

Deterministic modelling for the largest swept area of surface oil at ≥10 g/m^2 predicted that oil at this concentration may be present for <4 days following the spill event with a peak area of coverage of ~30 km^2 (Ref. 415).

Deterministic modelling for the largest entrained oil >100 ppb indicated that entrained oil above this concentration may be present for <20 days following the spill event, with a peak area of coverage of ~300 km^2. Deterministic modelling for the largest area of dissolved oil ≥10 ppb were predicted to be present for <3 days following the spill event, with a peak area of coverage of ~25 km^2. (Ref. 415).

The release of MDO would be subject to evaporation (when exposed to air), dispersion, dilution, and physical and biological degradation. Based on the predicted magnitude, spatial extent, and duration of an unplanned release of MDO, potential changes in water quality are expected to occur and for short-term durations. Therefore, potential change in water quality due to a MDO spill has been evaluated as Minor (5).

8.15.4.1.2 Risk: Potential adverse effects to BCH

Direct contact of hydrocarbons to subtidal habitats can cause smothering. The effects of physical contact on subtidal habitats are similar, and studies have shown that it can cause sublethal stress and reduced growth rates in seagrass (Ref. 465; Ref. 466), act as a barrier to diffusion of CO_2 across cell walls in macroalgae (Ref. 467), and a decline in metabolic rate, bleaching or partial mortality in corals (Ref. 468; Ref. 469) and impair respiration and photosynthesis by symbiotic zooxanthellae (Ref. 470; Ref. 471). The recovery of benthic habitats can be slow, with studies following the Deepwater Horizon (DWH) incident showing long-term non-acute effects of the spill on coral colonies seven years after the event (Ref. 472).

Given the surface release of the MDO, and that most of the oil is expected to either remain on the surface or within the upper water column, impacts to BCH within the deep offshore waters of the Hydrocarbon EMBA are typically not anticipated. However, geomorphic features located within the water column, such as banks and shoals, may be impacted by dissolved or entrained hydrocarbons.

Rankin Bank occurs within the Hydrocarbon EMBA, ~70 km north-east of the OA. Rankin Bank is considered a regionally significant habitat (Section 5.3.1.2); types of BCH include coral reef, macroalgae, and sponges. Stochastic modelling predicted a 2% probability of exposure to entrained oil above the moderate (≥100 ppb) exposure value during summer only for Rankin Bank; no exposure was predicted during other seasons (Ref. 415). Stochastic modelling did not predict exposure to dissolved oil (Ref. 415).

Banks and shoals would be expected to recover over time—these habitats are subject to high levels of natural variability (Ref. 473), suggesting they can adapt and recover to external factors. Therefore, potential impacts to BCH associated with banks and shoals within the Hydrocarbon EMBA were assessed as Minor (5).

8.15.4.1.3 Risk: Potential adverse effects to marine fauna

Marine mammals

Marine mammals may be exposed to hydrocarbons from an oil spill at both the surface and within the water column, either through contact, inhalation, and/or ingestion (Ref. 425; Ref. 426).

Marine mammals are highly vulnerable to oil spills, although the effects at both individual and population levels are not fully understood (Ref. 427). The degree of exposure is strongly influenced by their morphology, biological behaviours and distribution, as well as the origin and evolution of the spill (Ref. 427). For example, marine mammals that feed on prey near the ocean surface are more likely to inhale oil following a spill, compared to deep-diving species like sperm whales, which spend extended periods at depth (Ref. 427; Ref. 426). Benthic feeders may ingest sunken oil while feeding in areas of contaminated sediment. Cetacean species that feed on invertebrates are at risk of indirect oil ingestion, as many invertebrates can accumulate PAHs without metabolising them (Ref. 426).

Baleen whales are vulnerable due to blowhole breathing, surface filter feeding, and invertebrate prey (Ref. 426), killer whales may also be at risk due to population sizes, complex social structure, slow reproductive turnover, and dietary specialisation (Ref. 426) The effect of oil on cetacean skin is likely minor; however, prolonged contact with oil can lead to long-term coating that may interfere with filtering capacity in baleen whales (Ref. 428). Toothed whales and dolphins may be susceptible to ingestion of in-water oil as they gulp feed at depth. However, as highly mobile species, in general it is not expected that these animals will be constantly exposed to concentrations of hydrocarbons in the water column for continuous durations (e.g. >48–96 hours) that would lead to chronic effects.

After an oil spill, the highest concentrations of volatile hydrocarbons are typically found at the air-water interface (Ref. 429). If compounds from the oil get into the bloodstream of marine mammals, they can cause neurological disorders, physiological damage and impacts on the endocrine system, with the consequent effects on reproductive success (Ref. 430; Ref. 431; Ref. 432; Ref. 433).

Following the DWH oil spill, a population of bottlenose dolphins experienced increased mortality, reproductive failure, and a rise in disease incidence (Ref. 427;

Ref. 434). Although baseline data from the spill location were limited, combined models extrapolated from detailed studies of nearshore bottlenose dolphin populations with predictions of offshore cetacean survival and recovery identified that population declines are likely to occur in the initial years, with recovery expected within 5–15 years (Ref. 434). Given the characteristics of the crude oil, the physical extent and duration of the DWH spill, the event and impacts are considered severe, in comparison with potential MDO vessel spills from the petroleum activity.

Dugongs have smooth skin, which makes them less susceptible to oil adhering to their surface. However, their sparsely distributed sensory hairs, believed to play a role in orientation, could be negatively impacted if coated in oil (Ref. 435). Ingestion of oil, whether directly or indirectly through contaminated seagrass, may lead to toxic effects; however, there is currently no information on potential sublethal effects of oil exposure in sirenians, and reports of oil pollution impacts to dugongs are rare (Ref. 435). Toxic effects of oil and associated vapors on the eyes and respiratory system in dugongs are expected to be similar to those observed in other marine mammals (Ref. 435).

As identified in Section 5.3.3.1, marine mammals listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Hydrocarbon EMBA. The following BIAs for marine mammals intersect the Hydrocarbon EMBA:

- dugong (breeding, calving, foraging [high density seagrass beds] and nursing)
- humpback whale (migration [north and south] and resting)
- pygmy blue whale (migration and possible foraging area)
- southern right whale (migration and reproduction).

Both stochastic and deterministic analyses were utilised to understand the potential extent and duration of exposure.

Deterministic modelling for the largest swept area of surface oil at ≥10 g/m^2 predicted that surface oil at this concentration may be present for <4 days following the spill event, with a peak area of coverage of ~30 km^2 occurring ~1 day after the spill commenced (Ref. 415). Using the pygmy blue whale migration BIA as an example, the spatial extent of surface oil above the exposure value was predicted to be <0.01% of the entire BIA.

The modelling did not predict surface hydrocarbons concentrations ≥10 g/m^2 in State waters during any season (Ref. 415); consequently, nearshore waters and subsequent impacts from surface exposure to nearshore BIAs (e.g. dugong and southern right whale BIAs) are not expected.

Deterministic modelling for the largest area of entrained oil ≥100 ppb indicated that entrained oil at this concentration may be present for <20 days following the spill event, with a peak area of coverage of ~300 km^2 occurring ~4 days after the spill commenced (Ref. 415). Using the pygmy blue whale migration BIA as an example, the spatial extent of entrained oil above the exposure value was predicted to be <0.1% of the entire BIA. Based on the stochastic modelling, the maximum residence time of entrained oil exposure ≥100 ppb within this BIA is predicted to be <8 days.

Based on an assessment of the predicted magnitude and duration of an unplanned release of MDO and the mobile and transitory nature of marine mammals within the potentially impacted area, it is expected that only individuals to a small proportion of any marine mammal population is likely to be exposed

above the defined exposure value that may result in sublethal or lethal effects. Therefore, the potential impacts of oil to cause sublethal or lethal effects to marine mammals were ranked as Minor (5) and Moderate (4), respectively.

Marine reptiles

Marine reptiles may be exposed to hydrocarbons from oil spills at the water surface, within the water column, and along shorelines. Turtles are vulnerable at all life stages, with exposure occurring through direct contact or contamination of their habitats (Ref. 437). Direct exposure, particularly when it blocks the nostrils, may lead to prolonged inhalation of toxic gases, potentially causing respiratory diseases and damage to organs such as the liver and brain (Ref. 438; Ref. 439; Ref. 440).

Oil contact may also result in skin lesions (e.g. inflammation, elevated skin temperature, and chemical burns) (Ref. 439; Ref. 441; Ref. 442; Ref. 443; Ref. 444) and impar movements, leading to exhaustion and increased vulnerability to predators (Ref. 445). Ingested oil can lead to bioaccumulation of PAHs and reduces the assimilation of food (Ref. 440).

Oil spills in shallow coastal foraging areas have been linked to increased marine turtle strandings. Yaghmour (Ref. 439) reported that nearly one-third of strandings along the eastern coast of the United Arab Emirates occurred within 10 days of a spill, with affected turtles showing signs of oil exposure and buoyancy disorders.

Additionally, nesting habitat for Kemp's ridley marine turtles in the Gulf of America declined in 2010 and 2013, coinciding with the DWH oil spill. While this suggests a potential link, it is noted that causality remains uncertain due to other anthropogenic stressors (Ref. 440).

As identified in Section 5.3.3.2, several marine reptiles species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Hydrocarbon EMBA. The internesting buffer BIA for flatback, green, hawksbill and loggerhead turtles may be exposed to hydrocarbon concentrations above relevant entrained exposure value for ecological effects.

Both stochastic and deterministic analyses were utilised to understand the potential extent and duration of exposure.

Stochastic modelling did not predict shoreline accumulation ≥100 g/m^2; therefore, impacts to nesting adult turtles and emerging hatchlings are not predicted and no further evaluation has been undertaken. Stochastic modelling also did not predict any surface or dissolved oil exposure within State waters, or any overlap between surface or dissolved oil and the BIAs for marine turtles. However, for comparative purposes, deterministic modelling for the largest swept area of surface oil at ≥10 g/m^2 predicted that surface oil a this concentration may be present for <4 days following the spill event, with a peak area of coverage of ~30 km^2 occurring ~1 day after the spill commenced (Ref. 415). Using the flatback turtle internesting buffer BIA as an example, the spatial extent of surface oil above the exposure value was predicted to be limited to <0.2% of the entire BIA.

Deterministic modelling for the largest area of entrained oil ≥100 ppb indicated that entrained oil at this concentration may be present for <20 days following the spill event, with a peak area of coverage of ~300 km^2 occurring ~4 days after the spill commenced (Ref. 415). Using the flatback turtle internesting BIA as an example, the spatial extent of entrained oil above the exposure value was predicted to be <1.5% of the entire BIA. However, stochastic modelling indicates that the probability of exposure to this BIA is relatively low at 10–14%. As such, if

a vessel spill was to occur during nesting season, it is possible that a small proportion of turtles may be exposed to entrained oil either within nearshore internesting habitats and/or further offshore.

The EPBC threatened short-nosed seasnake and leaf-scaled seasnake, along other EPBC marine listed seasnake species, may be present within the Hydrocarbon EMBA. Oil pollution has been identified as a pressure 'of potential concern' for seasnakes[137] (Ref. 446). These species are susceptible to oil on the sea surface (Ref. 446; Ref. 447; Ref. 448). As air-breathing, obligate bottom feeders, seasnakes may inhale or ingest oil (Ref. 446; Ref. 449). Both the threatened short-nosed seasnake and leaf-scaled seasnake occur primarily on reef flats or in shallow waters of the outer reef edges to depths of 10 m (Ref. 450; Ref. 451).

The EPBC migratory salt-water crocodile may also be present within the Hydrocarbon EMBA. Oil pollution has been identified as a pressure 'of not of concern' for this species (Ref. 446). The salt-water crocodile inhabits Australian coastal waters, estuaries, lakes, inland swamps, and marshes (Ref. 77).

Stochastic modelling did not predict surface oil exposure in State waters or nearshore habitats during any season, and shoreline exposure at or above ≥100 g/m^2 was not predicted. Consequently, exposure to most seasnakes or the salt-water crocodile habitats are not expected.

There are some seasnake species (e.g. yellow-bellied seasnake) which are known to be pelagic and live in the open ocean. Although seasnakes may be present in offshore waters, their abundance is not expected to be high. Potential impacts to seasnakes from direct contact with hydrocarbons are likely to result in similar physical effects to those recorded for marine turtles and may include potential damage to the dermis and irritation to mucus membranes of the eyes, nose and throat (Ref. 436). Seasnakes may also be impacted when they return to the surface to breathe and inhale the toxic vapours associated with the hydrocarbons, resulting in damage to their respiratory system.

Based on an assessment of the predicted magnitude and duration of an unplanned release of MDO, it is expected that only individuals to a small proportion of any marine reptile population is likely to be exposed above the defined exposure value that may result in sublethal or lethal effects. Therefore, the potential impacts of oil to cause sublethal or lethal effects was ranked as Minor (5).

Fishes, including sharks and rays

Fishes, including sharks and rays, may be exposed to hydrocarbons from an oil spill within the water column. However, some shark species (including whale sharks) feed in surface waters, so there is also the potential for surface hydrocarbons to be ingested.

The impact of oil on fish can vary depending on habitat, behaviour, diet, life stage, and the type of oil involved (Ref. 452). Light oils and petroleum products may cause acute toxicity, although the toxic event is generally over quickly (Ref. 453). Chronic or long-term damage is less likely, as dissolved or entrained

[137] The pressure analysis distinguished between oil pollution from shipping ('of less concern') and oil rigs ('of potential concern') (Ref. 446). Although the aspect source for this risk assessment is a spill from a vessel, the higher-pressure concern has been adopted.

hydrocarbons are usually insufficient to harm free-swimming fish and sharks (Ref. 454).

Potential effects on fish include liver damage, irritation of the stomach and intestinal lining, reduced oxygen absorption, decreased reproductive output, and toxic effects on embryos (Ref. 452; Ref. 455). Fish are most vulnerable to oil during embryonic and larval stages (Ref. 456; Ref. 457; Ref. 458). In contrast, juvenile and adult fish are generally more mobile, selective in their feeding, and possess enzymes that help detoxify many oil compounds (Ref. 453), which limits their exposure.

Given the surface release of the MDO, and that most of the oil is expected to either remain on the surface or within the upper water column, impacts to demersal fish within the deep offshore waters of the Hydrocarbon EMBA are typically not anticipated. Near the surface, fish can detect and avoid oil slicks, which means fish mortalities are rare during hydrocarbon spills in open waters (Ref. 459; Ref. 460).

As identified in Section 5.3.3.3, several fishes, including sharks and rays species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Hydrocarbon EMBA. The foraging and foraging (high density prey) BIAs for the whale shark may be exposed to hydrocarbon concentrations above the relevant entrained exposure values for ecological effects.

Stochastic and deterministic analyses were utilised to understand the potential extent and duration of exposure.

Deterministic modelling for the largest area of entrained oil ≥100 ppb indicated that entrained oil at this concentration may be present for <20 days following the spill event, with a peak area of coverage of ~300 km^2 occurring ~4 days after the spill commenced (Ref. 415). Using the whale shark foraging BIA as an example, the extent above exposure value was predicted to be 0.1% of the entire BIA. Based on the stochastic modelling, the maximum residence time of entrained oil exposure ≥100 ppb within this BIA is predicted to be <5 days.

Based on an assessment of the predicted magnitude and duration of an unplanned release of MDO and the mobile and transitory nature of fishes, including sharks and rays within the potentially impacted area, it is expected that only individuals to a small proportion of fishes, including sharks and rays are likely to be exposed above the defined exposure value that may result in sublethal or lethal effects. Therefore, the potential impact was ranked as Minor (5).

Seabirds and shorebirds

Birds may be exposed to hydrocarbons from an oil spill at the water surface (e.g. foraging, resting, roosting) or on the shoreline (e.g. roosting, nesting). Species that rest or roost on the water's surface (e.g. shearwaters), and those that plunge-dive to feed (e.g. terns, boobies), are particularly vulnerable to surface oil due to their frequent contact with the water surface, small body size, and limited fat reserves (Ref. 461; Ref. 462).

Birds may suffer direct impacts from oil exposure, including suffocation or ingestion of toxic oil, often through preening contaminated feathers (Ref. 463). Ingestion of the aromatic fraction of an oil (e.g. BTEX) may result in metabolic and endocrine disruption, with emerging evidence indicating potential cardiotoxic effects (Ref. 462). Cardiac impairment may also contribute to embryotoxicity, which can occur when eggs are exposed to small amounts of oil (Ref. 462).

Additionally, direct contact with oil can interfere with key physiological and behavioural functions such as thermoregulation, flight, diving, swimming, and buoyancy (Ref. 463; Ref. 464).

As identified in Section 5.3.3.4, several birds species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Hydrocarbon EMBA. Breeding BIAs for lesser crested tern and wedge-tailed shearwater above the relevant entrained exposure values for ecological effects.

Stochastic and deterministic analysis were utilised to understand the potential extent and duration of exposure.

Stochastic modelling did not predict shoreline accumulation ≥100 g/m^2; therefore, impacts to roosting or nesting birds on shorelines are not predicted, and no further evaluation has been undertaken. Stochastic modelling also did not predict any surface or dissolved oil exposure within State waters. The only overlap between predicted surface oil exposure and a BIA was for the wedge-tailed shearwater.

Deterministic modelling for the largest swept area of surface oil at ≥10 g/m^2 predicted that surface oil at this concentration may be present for <4 days following the spill event, with a peak area of coverage of ~30 km^2 occurring ~1 day after the spill commenced (Ref. 415). Using the wedge-tailed shearwater breeding BIA as an example, the spatial extent of surface oil above the exposure value was predicted to be <0.1% of the entire BIA. As such, if a vessel spill event occurred during the breeding season, it is unlikely to impact entire local nesting populations.

Based on an assessment of the predicted magnitude and duration of an unplanned release of MDO and the mobile and transitory nature of seabirds and migratory shorebirds within the potentially impacted area, it is expected that only individuals to a small proportion of any bird population is likely to be exposed above the defined exposure value that may result in sublethal or lethal effects. Therefore, the potential impact was ranked as Minor (5).

8.15.4.1.4 Risk: Potential change to the functions, interests and activities of other marine users

Commercial fisheries

As identified in Section 5.4.1, several commercial fisheries with fishing management areas and recent fishing effort recorded were identified within the Hydrocarbon EMBA. A spawning ground for the southern bluefin tuna was also identified within the Hydrocarbon EMBA.

Direct impacts to commercially targeted fish species are expected to be similar to those evaluated above for pelagic and demersal fishes. In the event of an unplanned release of MDO, limited exposure to juvenile and adult free-swimming fish are expected (Ref. 453; Ref. 454); this would be the same for commercially important adult or migratory juvenile fish species (e.g. southern bluefin tuna, yellowfin tuna). However, fish stocks may be vulnerable to oil spills close to the spawning grounds or egg and larval drift areas. Fish eggs and larvae are typically vulnerable to toxic oil compounds due to their small size, poorly developed membranes and detoxification systems as well as their position in the water column (Ref. 456; Ref. 457; Ref. 458). Despite potential mortality of eggs and larvae following a spill, subsequent depletion of adult wild fish stocks is rarely recorded (Ref. 454).

Entrained and dissolved deterministic analyses were utilised to understand the potential extent and duration of exposure to known southern bluefin tuna spawning ground.

Deterministic modelling for the largest area of entrained oil ≥100 ppb indicated that entrained oil at this concentration may be present for <20 days following the spill event, with a peak area of coverage of ~300 km^2 occurring ~4 days after the spill commenced (Ref. 415). Based on the spatial extent of the southern bluefin tuna spawning ground (~1,850,475 km^2), the spatial extent of entrained hydrocarbons above the exposure value was predicted to be ~0.02% of the entire spawning ground.

Deterministic modelling for the largest area of dissolved oil ≥10 ppb indicated that dissolved oil at this concentration may be present for <3 days following the spill event, with a peak area of coverage of ~25 km^2 occurring the day the spill commenced (Ref. 415). Based on the spatial extent of the southern bluefin tuna spawning ground (~1,850,475 km^2), the spatial extent of dissolved oil above the exposure value was predicted to be ~0.01% of the entire spawning ground. As such, effects on southern bluefin tuna larvae are expected to be limited and unlikely to substantially affect the broader population of this commercially targeted species.

Spill events also have the potential to impact commercial fisheries through indirect impacts. Commercial fishing may be impacted by exclusion zones associated with the unplanned release of MDO, and subsequent reduction in fishing effort. Exclusion zones may impede access to commercial fishing areas for a short time, and nets and lines may become oiled. However, the impacts to commercial fishing from a public perception may be much more significant and longer term than the actual spill.

Fishing areas may be temporarily closed for fishing because of the risks of the catch being tainted by hydrocarbons. Concentrations of oil contaminants in fish, crustacean and mollusc tissues could pose a significant potential for adverse human health effects, and until these products are cleared by health authorities, they could be restricted for sale and human consumption. Toxicity in adult fish has been reported in response to diesel exposure (Ref. 476; Ref. 477). Uptake of oil has been demonstrated in bony fish after exposure to water-accommodated fraction of between 24 and 48 hours. Davis et al (Ref. 478) reported detectable tainting of fish flesh after a 24-hour exposure to marine fuel oil concentrations of 0.33 ppm and diesel concentrations of 0.25 ppm. Most studies, from laboratory trials or of fish collected after release events (including the Hebei Spirit, Macondo, and Sea Empress spills), find evidence of elimination of PAHs in fish, with tissues returning to reference levels within two months of exposure (Ref. 478; Ref. 479; Ref. 480; Ref. 481; Ref. 482; Ref. 483; Ref. 484).

If there are impacts to fish stocks associated with impacts to the larval life phase of fish, there is the potential for reduced profits for commercial fisheries over a longer time, and potential for reduced fishing quotas or exclusion zones which could exclude fishing effort.

The Montara spill of a light gas condensate (the most recent [2009] example of a large hydrocarbon spill in Australian waters) occurred over an area fished by the Northern Demersal Scalefish Managed Fishery (11 icences held by 7 operators), with goldband snapper, red emperor, saddletail snapper and yellow spotted rockcod being the key species fished (Ref. 485). As a precautionary measure, the then WA Department of Fisheries (now part of DPIRD) advised the commercial

fishing fleet to avoid fishing in oil-affected waters. Testing of fish caught in areas of a visible slick (November 2009) found no detectable petroleum hydrocarbons in fish muscle samples, suggesting fish were safe for human consumption. Limited ill effects were only detected in a small number of individual fish (Ref. 485). No consistent effects of exposure on fish health could be detected within two weeks of the end of the well release. Follow-up sampling in areas affected by the spill during 2010 and 2011 (Ref. 485) found negligible ongoing environmental impacts from the spill.

If an MDO spill occurred as the result of a vessel collision, a temporary fisheries closure may be put in place by DPIRD or AFMA (or voluntarily by the fishers themselves). MDO may foul the hulls of fishing vessels and associated equipment, such as gill nets. A temporary fisheries closure, combined with oil tainting of target species (actual or perceived), may lead to financial losses to fisheries and economic losses for individual licence holders. Fishery closures and the flow-on losses from the lack of income derived from these fisheries are likely to have short-term and localised socio-economic consequences, such as reduced employment (in fisheries service industries, such as tackle and bait supplies, fuel, marine mechanical services, accommodation etc.). Therefore, based on limited effects to commercial fishery stocks, and potential minor loss of revenue due to closures (for perceived or actual impact) CAPL assesses change to the functions, interests and activities of fisheries as localised and short term and it is ranked as Minor (5) consequence.

Tourism and recreation

As identified in Section 5.4.5, tourism and recreational activities may occur within the Hydrocarbon EMBA, however except for some offshore recreational fishing, most marine tourism and recreational activities occur in the shallower State waters. Marine nature-based tourist and recreational areas within the Hydrocarbon EMBA include Ningaloo (inclusive of the reef, marine area, and broader World Heritage area) and around the Pilbara Inshore Islands.

The presence of oil within areas used for tourism or recreational activities may reduce the visual amenity of the area, and because these destinations offer primarily nature-based tourism, potential environmental impacts to these places may also reduce visitor numbers. Reduced visitor numbers may also lead to a minor loss of revenue for tourist operators (e.g. charter fishing cancellations due to fishery closures).

Stochastic modelling did not predict visible oil on the water (≥1 g/m^2 exposure value) in State waters during any season (Ref. 415). Therefore, no further evaluation of visual amenity affects to water-based tourism or recreational activities in State waters has been undertaken.

Stochastic modelling predicted a very low probability (1%) of shoreline accumulation ≥10 g/m^2 (visible exposure value) within the Ningaloo Coast World Heritage Area during summer only. Based on deterministic modelling, shoreline contact is estimated to occur ~32 days after the spill commenced, with a peak oil volume of 1.6 m^3 (Ref. 415).

Shoreline loading can adversely impact the visual amenity of coastal areas and potentially restrict beach access for users. However, if shoreline contact occurs (highly unlikely), it is expected that any impacts from this type of event would be of short duration and have a relatively small total volume ashore. As such, given the volume, type of oil (marine fuel) and predicted weathering, CAPL assesses the

reduction in amenity resulting in change to the functions, interests and activities of tourism and recreation as a Minor (5) consequence.

8.15.4.1.5 Risk: Potential changes to values and sensitivities of protected areas

As identified in Section 5.5, several marine and terrestrial protected areas were identified within the Hydrocarbon EMBA.

Stochastic modelling predicted a very low probability (1%) of shoreline accumulation ≥10 g/m^2 (visible exposure value) at Ningaloo Coast World Heritage Area, where Cape Range South National Park is also located. Based on the deterministic modelling, shoreline contact is estimated to occur ~32 days after the spill commenced, with a peak oil volume of 1.6 m^3. Shoreline contact was only predicted during the summer season. No shoreline contact was predicted to occur at the higher exposure values associated with ecological effects (Ref. 415).

Stochastic modelling also predicted a relatively low probability of entrained oil exposure at ≥100 ppb within the Gascoyne (5–11%) and Montebello (0–2%) AMPs (Ref. 415). No surface oil or dissolved oil was predicted to occur within the AMPs. No seabed oil exposure was predicted, given the propensity of MDO to remain within the upper water column.

The natural values of these AMPs include species listed as threatened, migratory, marine, or cetacean under the EPBC Act, as well as any identified BIAs for protected marine fauna. Social and economic values of the AMPs include fishing and tourism and recreation. The consequence evaluations to marine fauna and commercial fisheries are provided above.

Given the expected behaviour and weathering of MDO, the limited spatial and temporal exposure to marine fauna or commercial fish species above exposure values that may result in sublethal or lethal effects, the potential impacts of a vessel spill event to the values and sensitivities of these protected areas have been ranked as Moderate (4).

8.15.4.1.6 Risk: Potential changes to tangible cultural heritage values

As identified in Section 5.6, there are heritage listed places or sites within the Hydrocarbon EMBA, including the World and National heritage listed Ningaloo Coast, Commonwealth listed Ningaloo Marine Area and Learmonth Air Weapons Rage, historic shipwrecks, as well as several protected First Nation sites or artefacts along (or adjacent to) the coast of the North West Cape.

Protected UCH (shipwrecks, Table 5-27) have been identified within the Hydrocarbon EMBA. Given known sea level history, areas in water depths of <125 m would have been emergent land during the extended history of First Nations occupation of Australia; therefore, shallower waters within the Hydrocarbon EMBA have a higher relative likelihood of encountering UCH than the deeper waters, given the concentration of maritime infrastructure, anchorage activity, navigational hazards, and vessel groundings, as well as increased potential for the survival of remains (Ref. 149). At the time of writing this EP, CAPL understands through consultation with the relevant First Nations people and/or representative bodies that no Aboriginal UCH has been identified within the Hydrocarbon EMBA where seabed disturbance could credibly occur. Given the surface release of the MDO, and that most of the oil is expected to either remain on the surface or within the upper water column, impacts to seabed-based UCH (e.g. shipwrecks or archaeology), including First Nations UCH, are not expected.

Stochastic modelling predicted very low (1%) probability of shoreline accumulation ≥10 g/m^2 (visible exposure value) at Ningaloo Coast World Heritage Area. Based on the deterministic modelling, shoreline contact is estimated to occur ~32 days after the spill commenced, with a peak oil volume of 1.6 m3. Shoreline contact was only predicted during the summer season (Ref. 415). No shoreline contact was predicted to occur at the higher exposure values associated with ecological effects.

Given the expected behaviour and weathering of the MDO, limited spatial and temporal exposure, only a small area is predicted to be exposed due to a single spill event. Therefore, potential changes to tangible cultural heritage values was ranked as Minor (5).

8.15.4.2 Control measures

Table 8-72 and Table 8-73 describe the control measures relevant to this aspect. Note: While Table 8-73 assesses additional control measures, for any element already documented in the OPEP this evaluation is provided for context only. The OPEP remains the overarching control measure implemented for the activity.

Table 8-72: Good practice control measures relevant to unplanned release—loss of containment (vessel collision)

Control measure	Description
CM-01: Maritime safety information	Maritime safety information, such as AUSCOAST navigational warnings, are issued by the Joint Rescue Coordination Centre (JRCC) Australia, part of AMSA. Under the *Navigation Act 2012* (Cth), the AHO is also responsible for maintaining and disseminating navigational charts and publications, including providing safety-critical information to mariners (including any change to prohibited/restricted areas, obstructions to surface navigation, etc.) via the Notice to Mariners system. Notice to Mariners can be permanent or temporary notifications. Maritime safety information (radio-navigation warnings and/or Notice to Mariners will be issued; thus, enabling other marine users to also safely plan their activities
CM-02: Marine Order 27	Marine Order 27—Safety of navigation and radio equipment sets out requirements for safe navigation, radio equipment and communications. The AIS is a maritime communications device, and AIS equipped vessels (shipborne AIS) can use it to send and receive identifying information. This identifying information can be displayed on an electronic chart, computer display, chart plotter or compatible navigation radar. As such, this identifying information can: • aid in situational awareness • provide a means to assist in collision avoidance
CM-03: Marine Order 28	Marine Order 28—Operations standards and procedures sets out requirements and responsibilities for vessel crew, including watchkeeping standards
CM-04: Marine Order 30	Marine Order 30—Prevention of collisions and section 176 of the *Navigation Act 2012* (Cth) gives effect to the COLREGS, which has lighting and signal requirements for vessels. These requirements include the use of appropriate lights and shapes to reflect the nature of vessel activities (e.g. restricted in the ability to manoeuvre, vessels underway, etc.). These requirements ensure other marine users in the vicinity are aware of the nature of the vessel activities

Control measure	Description
CM-46: Vessel crew training and certification	Crew member on vessels operating in Australian waters under the *Navigation Act 2012* (Cth), are required to hold a current Standards of Training, Certification and Watchkeeping for Seafarers (or equivalent) certificate as appropriate to duties. AMSA is responsible for issuing maritime certifications and regulating the issuance of certifications in accordance with standards that meet Australia's obligations under the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
CM-45: MARPOL 73/78 (SOPEP)	MARPOL 73/78 Annex I and Marine Order 91—Marine pollution prevention—oil requires that vessels (as appropriate to vessel class) has an approved SOPEP in place. To prepare for a spill event, the SOPEP details: • response equipment available to control a spill event • review cycle to ensure that the SOPEP is kept up to date • testing requirements, including the frequency and nature of these tests. In the event of a spill, the SOPEP details: • reporting requirements and a list of authorities to be contacted • activities to be undertaken to control the discharge of oil • procedures for coordinating with local officials
CM-47: OPEP	Under the OPGGS(E)R, NOPSEMA require that the petroleum activity have an accepted OPEP in place before commencing the activity. If a vessel collision occurs, the OPEP will be implemented
CM-48a: OSM-BIP	The OSM-BIP describes a program of monitoring oil pollution that will be adopted in the event of a hydrocarbon spill incident (Level 2–3) to marine waters. The OSM-BIP is aligned to the Joint Industry Operational and Scientific Monitoring Framework (Ref. 475) and describes how this Framework applies to Chevron's activities and spill risks in Australian waters. CAPL has developed an OSM-BIP to support all spill monitoring activities across all its assets. The OSM-BIP includes arrangements with OSM services providers with the scientific and technical capability to mobilise operational and scientific monitoring resource according to the timeframes required to help inform response decision-making and remediation activities.
CM-49: EMT	An emergency management team (EMT) capable of managing a response to the worst-case discharge scenario described in this EP will be maintained

Table 8-73: Additional control measures evaluated for unplanned release—loss of containment (vessel collision)

Control measure	Benefit	Cost
Vessels with fully protected internal tanks (double hull)	The use of vessels with fully protected internal tanks (double-hull construction) may reduce the potential environmental impacts and risks associated with a vessel collision incident.	Restricting vessel selection to vessels with fully protected internal tanks (double hull) would reduce vessel availability and operational flexibility, potentially resulting in scheduling constraints, activity delays and increased project costs. Proposed control measures, together with compliance with applicable maritime requirements, already reduce the likelihood of a vessel incident. As a result, the additional reduction in environmental risk that may be achieved through exclusive use of vessels with fully protected internal tanks is limited.

Control measure	Benefit	Cost
		Given the limited incremental environmental benefit and the associated operational and cost impacts, the costs of implementing this control measure are considered grossly disproportionate to the reduction in risk achieved. Therefore, this control has not been adopted for use.
OPEP—Containment and recovery (CAR)	When used in conjunction with other response strategies, CAR can provide a beneficial supporting response by targeting isolated patches of weathered hydrocarbons and reducing the volume of hydrocarbons potentially available to impact sensitive receptors, including shorelines. These activities will generally target residual swathes or patches of weathered surface hydrocarbons. As identified in Table 6-1 of the OPEP (Preliminary Screening of Event Response Options), CAR has been assessed as a secondary response option only. Group 2 hydrocarbons (e.g. MDO/ Geryon condensate) are highly volatile, rapidly spreading products that typically evaporate and disperse quickly following release. Consequently, opportunities for effective containment and recovery are limited, particularly in offshore environments where weathering processes further reduce recoverable volumes. As outlined in Section 9.3, CAR is therefore not considered an effective primary response strategy for these release scenarios. In addition, implementation of CAR for Group 2 hydrocarbons in offshore locations is likely to be resource intensive and operationally inefficient relative to the volumes that could realistically be recovered. Deployment would also increase health and safety risks to responders due to the volatile nature of the product. As a result, CAR is not expected to materially reduce the potential environmental impacts or risks associated with these releases. Where CAR may provide a benefit as a secondary response option, CAPL has established emergency management arrangements to facilitate its implementation where appropriate. Section 10.3.9 outlines the response strategy, including access to Australian, regional and	N/A

Control measure	Benefit	Cost
	global response resources through mutual aid arrangements and oil spill response organisations. Further details of spill response arrangements are provided in Appendix C of the OPEP. While CAR may provide a limited environmental benefit in specific circumstances, this benefit is expected to be minor due to the characteristics of the hydrocarbons and the offshore nature of the petroleum activity. Accordingly, implementing CAR as a primary response option would not provide an environmental or risk-reduction benefit for this release scenario. No further evaluation has been undertaken.	
OPEP—Shoreline Protection and Deflection (SPD)	SPD is a primary response option for nearshore spills (Section 6.5 of the OPEP). This response option uses booming systems to physically contain, divert or exclude hydrocarbons from shorelines and sensitive coastal environments. The OA, where a vessel collision is considered a credible (but unlikely) event, is located offshore in water depth >1,100 m (not nearshore) and ~75 km from the nearest land (Montebello Islands). As identified in Section 8.15.3, no shoreline accumulation ≥100 g/m^2 exposure value (i.e. associated with the lowest concentration of shoreline oil that is likely to require clean-up effort) was predicted. Given that no shoreline accumulation at concentration of shoreline oil that is likely to require clean-up effort was predicted, implementation of SPD would not reduce the environmental impacts or risks associated with this release scenario. The preliminary screening and Strategic NEBA therefore indicate that SPD would provide no overall environmental benefit for this scenario. As SPD would not provide an environmental or risk-reduction benefit for this release scenario, no further evaluation has been undertaken. Note that an Operational NEBA would nevertheless be completed prior to implementing any response strategy to confirm that the proposed response would provide an overall benefit to receptors, as outlined in Section 6.4.2 of the OPEP.	N/A

Control measure	Benefit	Cost
OPEP—Pre-oiled shoreline response planning	Pre-oiled shoreline assessments can support shoreline clean-up activities by evaluating shoreline conditions before impact, establishing shoreline segments, setting clean-up priorities and identifying suitable response tactics. Additional pre-shoreline response planning may also assist in directing resources to high-value receptors where there is a benefit in reducing receptor exposure (see Section 9.2.2). As identified in Section 8.15.3, no shoreline accumulation ≥100 g/m^2 exposure value (i.e. associated with concentration of shoreline oil that is likely to require clean-up effort) was predicted. Shoreline accumulation at ≥10 g/m^2 exposure value (i.e. associated with social, economic, or cultural features) was predicted in summer only, with a 1% probability, a minimum arrival time of ~32.4 days. CAPL has also established a Protection Prioritisation Process (PPP) and Tactical Response Guides (TRGs) for priority shoreline receptors (Section 9.2.2). The PPP includes pre-prepared Strategic TRGs for locations where shoreline contact is predicted within 4-days and preparing Operational TRGs for receptors where contact is predicted after 4 days or more. The 4-day window has been selected as ample time to understand spill trajectories and operational response requirements and fits within the 14-day OSM-BIP prioritisation window. Consequently, the environmental benefit associated with implementing additional pre-oiled shoreline response planning is considered limited.	Implementation would require additional personnel time and effort to undertake shoreline assessments and develop planning products beyond the existing PPP and TRG framework. Given the low probability of shoreline exposure, the absence of shoreline accumulation associated with concentration of shoreline oil that is likely to require clean-up effort, and the extended predicted shoreline arrival time, the existing PPP and TRG framework provides sufficient opportunity to undertake shoreline response planning if required. Consequently, the current process for tactical pre-oiled shoreline response planning is considered appropriate and additional pre-oiled shoreline response planning has not been adopted.
OPEP—Pre-deployment of shoreline protection equipment	Pre-deployment of shoreline protection equipment may reduce mobilisation and deployment times following a spill, potentially increasing the effectiveness of shoreline protection activities where there is a credible risk of shoreline exposure. Early deployment may also assist in reducing hydrocarbon contact with sensitive shoreline receptors where protection and deflection strategies are considered feasible. As identified in Section 8.15.3, no shoreline accumulation ≥100 g/m^2 exposure value (i.e. associated with	Implementation would require the mobilisation, deployment, maintenance and periodic replacement of shoreline protection equipment at remote coastal locations. Ongoing inspection and monitoring activities would also be required to ensure equipment remains suitable for implementation. The activity may introduce additional environmental impacts and risks, including physical disturbance to intertidal and shoreline habitats, and increase health and safety risks associated with personnel access,

Control measure	Benefit	Cost
	concentration of shoreline oil that is likely to require clean-up effort) was predicted. Shoreline accumulation at ≥10 g/m^2 exposure value (i.e. associated with social, economic, or cultural features) was predicted in summer only, with a 1% probability, a minimum arrival time of ~32.4 days. In addition, the predicted shoreline exposure was limited to Ningaloo Coast. As discussed in Section 9.4.2, the high-energy wave environment, shallow fringing reefs and environmental sensitivity of this area may limit the effectiveness and practicability of shoreline protection activities. Given the very low probability of shoreline exposure, absence of shoreline accumulation associated with concentration of shoreline oil that is likely to require clean-up effort and the extended predicted arrival time, the environmental benefit associated with pre-deployment of shoreline protection equipment is considered limited.	transport and deployment activities in remote coastal environments. Given the low probability of shoreline exposure, the absence of shoreline accumulation associated with concentration of shoreline oil that is likely to require clean-up effort, the extended predicted shoreline arrival time and the potential environmental and HSE risks associated with deployment activities, the costs associated with implementing this control measure are considered grossly disproportionate to the environmental benefit gained. Consequently, this control has not been adopted for use.
OSM-BIP—Pre-contracted dedicated OSM sampling vessel, with trained OSM personnel, on standby for the duration of the drilling activity	Chartering and equipping vessels on standby for OSM would reduce mobilisation time for water quality monitoring by an estimated 12 to 24 hours following a Level 2 or Level 3 spill event, providing earlier data on hydrocarbon exposure.	Implementation of this control would require a dedicated standby vessel for the duration of the activity, resulting in additional vessel charter costs of approximately $75,000 to $200,000 per week (depending on vessel specifications and readiness), increased organisational complexity, and additional environmental impacts and risks associated with vessel presence (e.g. GHG emissions, sound emissions, vessel discharges). The costs of having a small team of trained OSM personnel available on standby closer to the spill location release would be >$3–4 M / per annum, regardless of whether an oil spill occurred. Under the current OSM Services Provider contract, activation is provided within 72 hours of notification. CAPL maintains standing OSM-BIP arrangements and has access to the NWS vessel fleet through concurrent operations and MoU, providing access to suitable vessels and resources within the planned response timeframes. As such, maintaining a dedicated standby vessel and OSM personnel would provide limited additional environmental benefit. Given the limited incremental environmental

Control measure	Benefit	Cost
		benefit, together with the additional environmental impacts, operational complexity and vessel charter costs, the costs associated with implementing this control measure are considered grossly disproportionate to the environmental benefit gained. This approach is also not standard industry practice in Australia or internationally. Therefore, this control has not been adopted for use.
CM-48b: OSM-BIP—Maintain initial water quality / hydrocarbon sampling kits for pre-positioning on Barrow Island and selected vessels, and develop technical procedure for sample collection.	The availability of initial water quality / hydrocarbon sampling kits on Barrow Island and selected vessels (and an accompanying technical procedure for sample collection) provides an opportunity for more rapid initial measurements of hydrocarbon properties. This information can provide important initial situational awareness information that aids decision making in both monitoring and response efforts.	Implementing this control measure will involve time and effort to source and supply the initial water quality / hydrocarbon sampling kits. There will also be employee time involved in developing the technical procedure (such that untrained vessel personnel are able to collect these initial samples). However, adoption of this control measure provides an additional and potentially quicker opportunity for initial water quality sampling to aid situational awareness for decision making in monitoring and response teams, therefore this control measure has been adopted
CM-48c: OSM-BIP—Conduct periodical review of existing baseline data sources across receptors within the CAPL OSM Planning Area.	This ensures that receptors with deficient baseline data are identified. This a consideration for initial monitoring prioritisation and the finalisation of each SMP design.	Understanding the presence or absence, suitability and quality of baseline data for priority receptors is an important preparatory measure. Understanding which receptors have insufficient baseline data will help guide monitoring prioritisation and the finalisation of each SMP design and whether there is a need to include alternative designs. The cost for implementing this control measure are negligible in comparison with the environmental gained This control measure is considered reasonably practicable to implement and has been adopted.

8.15.4.3 ALARP justification

Vessel operations are routinely undertaken across the offshore petroleum industry, both nationally and internationally. The potential risks associated with a loss of containment from a vessel collision event are managed through established control measures prescribed by applicable legislation and/or recognised as standard industry practice. These requirements are well understood and implemented by the petroleum industry, including by CAPL. In addition, CAPL has worked in the NWS region for over 10 years, and has a demonstrated understanding of industry requirements and their operational implementation in this area.

During relevant persons consultation, a claim was raised regarding impacts to fisheries from a potential spill event. This claim was responded to by CAPL (see summary in 'external context' (Section 8.15.5) and within Appendix E.

Oil spill modelling has been used to inform the spatial extent of the Hydrocarbon EMBA and identify areas of potential oil exposure, and this is considered an appropriate basis to inform environmental risk assessments.

Based on the environmental risk evaluation and application of relevant assessment tools as commensurate with the predicted level of risk (e.g. higher-order risks), CAPL considers the adopted good practice and additional control measures (Section 8.15.4.2) are appropriate to manage the potential risks from a loss of containment from a vessel collision event. No further reasonably practicable control measures were identified that would provide a meaningful reduction in environmental risk without incurring grossly disproportionate costs. Accordingly, CAPL considers the potential environmental risks associated with this aspect to be reduced to ALARP.

8.15.4.4 Likelihood and risk level summary

Based on industry data, vessel collisions are considered rare, with only 3% of all marine incidents that occurred in Australian waters between 2005 and 2012 associated with a vessel collision event.

As most vessel collisions involve the loss of containment of a forward tank, which are generally double-lined and smaller than other tanks, the loss of the maximum credible volumes used in this scenario is not expected.

Considering the inherent low likelihood of a collision occurring, the control measures in place, and enactment of the OPEP, CAPL has assessed the likelihood and risk level as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Change in water quality			
Water quality	Minor (5)	Remote (5)	Very Low (9)
Potential adverse effects to BCH			
BCH	Minor (5)	Remote (5)	Very Low (9)
Potential adverse effects to marine fauna			
Marine mammals	Moderate (4)	Remote (5)	Low (8)
Marine reptiles	Minor (5)	Remote (5)	Very Low (9)
Fishes, including sharks and rays	Minor (5)	Remote (5)	Very Low (9)
Seabirds and shorebirds	Minor (5)	Remote (5)	Very Low (9)
Potential changes to the functions, interests and activities of other marine users			
Commercial fisheries	Minor (5)	Remote (5)	Very Low (9)
Tourism and recreation	Minor (5)	Remote (5)	Very Low (9)
Potential changes to values and sensitivities of protected areas			
Protected areas	Moderate (4)	Remote (5)	Low (8)
Potential change to tangible cultural heritage values			
Tangible cultural heritage values	Minor (5)	Remote (5)	Very Low (9)

8.15.5 Demonstration of acceptability

Table 8-74 describes the demonstration of acceptability relevant to this aspect.

Table 8-74: Demonstration of acceptability relevant to unplanned release—loss of containment (vessel collision)

Comparison with acceptable level
Acceptable level AL-23 is applicable to unplanned releases–loss of containment (vessel collision) associated with the petroleum activity (refer to Section 6.7). By adopting and implementing preventative control measures (Section 8.15.4.2), the risk of unplanned loss of containment due to a vessel collision is reduced to ALARP. Consequently, this preventative approach ensures the acceptable level AL-23 is met.
Principles of ESD
Precautionary Principle In accordance with Table 6-2, consequence level ranging from Minor (5) to Moderate (4) do not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level of Minor (5) to Moderate (4) do not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required. *Biodiversity Principle* The risks associated with this aspect is expected to affect only individuals to a small proportion of any marine fauna, which is not expected to result in effects at a population level that would prevent their long-term recovery or survival. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity
Relevant environmental legislation and other requirements
Legislation and other requirements considered relevant for this aspect include: • *Navigation Act 2012* (Cth) • *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (Cth) • Marine Order 27—Safety of navigation and radio equipment • Marine Order 28—Operations standards and procedures • Marine Order 30—Prevention of collisions • Marine Order 91—Marine Pollution Prevention—oil • *Conservation Management Plan for the Blue Whale 2015–2025 (*Ref. 52) • *Conservation Advice Balaenoptera physalus fin whale* (Ref. 282) • *Conservation Advice Balaenoptera borealis sei whale* (Ref. 283) • *Conservation Advice for Sousa sahulensis Australian humpback dolphin* (Ref. 284) • *Conservation Advice for Orcaella heinsohni Australian snubfin dolphin* (Ref. 285) • *National Recovery Plan for the Southern Right Whale (Eubalaena australis) (*Ref. 111*)* • *Recovery Plan for Marine Turtles in Australia* (Ref. 291) • *Conservation Advice for Leatherback Turtle* (Ref. 408) • *Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake)* (Ref. 450) • *Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake)* (Ref. 451) • *Conservation advice for the whale shark* (Ref. 292) • *Sawfish and River Sharks Multispecies Recovery Plan (*Ref. 409*)* • *Conservation Advice on Pristis clavate (Dwarf Sawfish)* (Ref. 486) • *Recovery Plan for the Grey Nurse Shark (Carcharias taurus)* (Ref. 487) • *Recovery Plan for the White Shark (Carcharodon carcharias) (*Ref. 488) • *Wildlife Conservation Plan for Seabirds* (Ref. 80) • *Wildlife Conservation Plan for Migratory Shorebirds* (Ref. 303)

- *National Recovery Plan for albatrosses and petrels* (Ref. 304)
- *Conservation Advice for Limnodromus semipalmatus (Asian dowitcher)* (Ref. 492)
- *Conservation Advice for Sternula nereis nereis (Fairy Tern)* (Ref. 495)
- *National Recovery Plan for (Sternula nereis nereis) (Australian Fairy Tern)* (Ref. 496)
- *National Recovery Plan for the Australian Painted Snipe Rostratula australis (*Ref. 493)
- *Conservation Advice for Tringa nebularia (Common Greenshank)* (Ref. 497)
- Conservation Advice for Calidris ferruginea (Curlew Sandpiper) (Ref. 498)
- *Conservation Advice for Numenius madagascariensis (Far Eastern Curlew)* (Ref. 499)
- *Conservation Advice for Charadrius leschenaultia (Greater Sand Plover)* (Ref. 501)
- *Conservation Advice for Limosa lapponica menzbieri (Yakutian bartailed Godwit)* (Ref. 503)
- *Conservation Advice for Calidris canutus (Red Knot)* (Ref. 504)
- *Conservation Advice for Calidris acuminata (Sharp-tailed Sandpiper)* (Ref. 506)
- North-west Marine Parks Network Management Plan (Ref. 145).

CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:

Requirement	Demonstration
Navigation Act 2012 (Cth) Notice to Mariners	Requirement to issue a Notice to Mariners has been incorporated into the **maritime safety information** control measure
Navigation Act 2012 (Cth) Watchkeeping certification	Requirement for crew members on vessels to hold a current Standards of Training, Certification and Watchkeeping for Seafarers (or equivalent) certificate has been incorporated into the **Vessel crew training and certification** control measure
Navigation Act 2012 (Cth) Use of AIS as per Marine Order 27	The use of shipborne AIS has been incorporated into the **AIS** control measure
Navigation Act 2012 (Cth) Vessel watchkeeping as per Marine Order 28	Vessel watchkeeping requirements has been incorporated into the **watchkeeping** control measure
Navigation Act 2012 (Cth) Use of lights and signals as per COLREGS and Marine Order 30	Requirement to exhibit appropriate lights and signals to reflect the nature of vessel operations has been incorporated into the **vessel lights and signals** control measure
Navigation Act 2012 (Cth) Marine Order 91 and Annex I of MARPOL 73/78	Requirements for a vessel to have a SOPEP have been incorporated into the **SOPEP / Shipboard Marine Pollution Emergency Plan** control measure
Conservation Management Plan for the Blue Whale 2015–2025 No specific conservation action identified	N/A
Conservation Advice Balaenoptera physalus fin whale No specific conservation action identified.	N/A
Conservation Advice Balaenoptera borealis sei whale No specific conservation action identified	N/A
Conservation Advice for Sousa sahulensis Australian humpback dolphin No specific conservation action identified	N/A
Conservation Advice for Orcaella heinsohni Australian snubfin dolphin	N/A

No specific conservation action identified	
National Recovery Plan for the Southern Right Whale (Eubalaena australis) No specific management action identified	N/A
Recovery Plan for Marine Turtles in Australia 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. Note: This is also a specific action identified for the green turtle NWS, loggerhead turtle WA, and flatback turtle Pilbara individual stocks	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Recovery Plan for Marine Turtles in Australia*
Conservation Advice for Leatherback Turtle No specific conservation action identified	N/A
Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake) Action: Ensure there is no anthropogenic disturbance in areas where the short-nosed sea snake occurs, excluding necessary actions to manage the conservation of the species.	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake)*
Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake) Action: Ensure there is no disturbance in areas where the leaf-scaled sea snake occurs, excluding necessary actions to manage the conservation of the species	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake)*
Conservation Advice for whale shark Conservation action: Assess the impacts of offshore installations and associated environmental changes (light spill, chronic noise, changed water temperature, localised nutrient levels) on whale sharks and mitigation options for these impacts	Section 8.15.4.1 provides a risk assessment and consideration of control measures for unplanned releases from a loss of containment (vessel colission). Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for whale shark*
Sawfish and River Sharks Multispecies Recovery Plan Action 5c: Identify risks to important sawfish and river shark habitat and measures needed to reduce those risks.	Section 8.15.4.1 provides a risk assessment to marine fauna and habitats predicted to be impacted from an unplanned release from the petroleum activity and consideration of control measures has been identified. Therefore, this activity is not considered to be inconsistent with the *Sawfish and River Sharks Multispecies Recovery Plan*
Conservation Advice on Pristis clavate (Dwarf Sawfish) No specific conservation action identified	N/A
Recovery Plan for the Grey Nurse Shark (Carcharias taurus)	N/A

No specific management action identified	
Recovery Plan for the White Shark (Carcharodon carcharias) No specific conservation action identified	N/A
Wildlife Conservation Plan for Seabirds Action 2h: Enhance contingency plans to prevent and/or respond to environmental emergencies that have an impact on seabirds and their habitats	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Wildlife Conservation Plan for Seabirds*
Wildlife Conservation Plan for Migratory Shorebirds Action 3f: Ensure all areas important to migratory shorebirds in Australia continue to be considered in development assessment processes	Section 8.15.4.1 provides a risk assessment to marine fauna and habitats predicted to be impacted from an unplanned release from the petroleum activity and consideration of control measures has been identified. Therefore, this activity is not considered to be inconsistent with the *Wildlife Conservation Plan for Migratory Shorebirds*
National Recovery Plan for albatrosses and petrels Action 5c: Risk based response strategies for marine pollution incidents are developed. Action 5b (adapted): Undertake, as feasible, monitoring of breeding colonies for marine pollution impacts, including as a priority: • incidence of oiled birds at nest • effect of marine pollution	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Monitoring, response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *National Recovery Plan for albatrosses and petrels*
Conservation Advice for Limnodromus semipalmatus (Asian dowitcher) No explicit relevant management actions: oil pollution recognised as a threat	N/A
Conservation Advice for Sternula nereis nereis (Fairy Tern) Ensure appropriate oil spill contingency plans are in place for the subspecies' breeding sites that are vulnerable to oil spills	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for Sternula nereis nereis (Fairy Tern)*
National Recovery Plan for (Sternula nereis nereis) (Australian Fairy Tern) No specific management action identified	N/A
National Recovery Plan for the Australian Painted Snipe Rostratula australis No specific management action identified	N/A
Conservation Advice for Tringa nebularia (Common Greenshank) No specific conservation action identified	N/A
Conservation Advice for Calidris ferruginea (Curlew Sandpiper) No specific conservation action identified	N/A

Conservation Advice for Numenius madagascariensis (Far Eastern Curlew) No specific conservation action identified	N/A
Conservation Advice for Charadrius leschenaultia (Greater Sand Plover) No specific conservation action identified	N/A
Conservation Advice for Limosa lapponica menzbieri (Yakutian bartailed Godwit) No specific conservation action identified	N/A
Conservation Advice for Calidris canutus (Red Knot) No specific conservation action identified	N/A
Conservation Advice for Calidris acuminata (Sharp-tailed Sandpiper) No specific conservation action identified	N/A
North-west Marine Parks Network Management Plan The Plan requires that '[a]ctions required to respond to oil pollution incidents, including environmental monitoring and remediation, in connection with mining operations authorised under the OPGGS Act may be conducted in all zones. The Director should be notified in the event of an oil pollution incident that occurs within, or may impact upon, an Australian Marine Park and, so far as reasonably practicable, prior to a response action being taken within a marine park'	The Gascoyne and Montebello Marine Parks are multiple use zone (IUCN VI). The control measures identified for managing an unplanned release provide for the response to, and environmental monitoring and remediation of, an oil pollution incident. Requirements to report oil pollution incidents that occur within, or may impact upon, an AMP is included in Section 10.6.2. Therefore, this activity is not considered to be inconsistent with the *North-west Marine Parks Network Management Plan*
Internal context	
These management processes or procedures were deemed relevant for this aspect: • OPEP (Ref. 2) • OSM-BIP (Ref. 5) Control measures related to the above management process have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.	
External context	
During relevant persons consultation, a concern was raised regarding impacts to fisheries from a potential spill event. CAPL provided a response that confirmed: • relevant fisheries (including information regarding specific species raised during consultation) are described in Section 5.4.1.1 • impacts to fisheries from a potential spill event are considered within the risk assessment in Section 8.15.4.1.4 and 8.16.4.1.6. No further objections or claims were raised regarding unplanned releases–vessel collision arising from the activity.	

8.15.6 Environmental performance

Table 8-75 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-75: Environmental performance relevant to unplanned release—loss of containment (vessel collision)

EPO	Control measure	EPS	MC
EPO-38: No unplanned release of hydrocarbons to the environment attributable to the petroleum activity	**CM-01:** Maritime safety information	**EPS-01.1:** MODU and vessels operating within the OA will comply with any Notice to Mariners requirements under the *Navigation Act 2012* (Cth).	**MC-01.1:** Records of lodgement of notification to relevant agency.
	CM-02: Marine Order 27	**EPS-02:** MODU and vessels will use shipborne AIS during the petroleum activity.	**MC-02:** Records indicate that shipborne AIS was used by the MODU and vessel/s during the petroleum activity.
	CM-03: Marine Order 28	**EPS-03:** MODU and vessels will implement watchkeeping standards in accordance with Marine Order 28.	**MC-03:** Records indicate that watchkeeping was undertaken in accordance with the requirements of Marine Order 28 during the petroleum activity.
	CM-04: Marine Order 30	**EPS-04:** In accordance with regulatory requirements, MODU and vessels will implement light and signals appropriate to the nature of their operations.	**MC-04:** Records indicate that vessel lights and signals were consistent with the requirements of COLREGS and the *Navigation Act 2012* (Cth) during the petroleum activity.
	CM-46: Vessel crew training and certification	**EPS-46:** MODU and vessel crew will hold a current Standards of Training, Certification and Watchkeeping for Seafarers (or equivalent) certificate as appropriate to duties.	**MC-46:** Records confirm that MODU and vessel crew held a current Standards of Training, Certification and Watchkeeping for Seafarers (or equivalent) certificate as appropriate to duties.
	CM-45: MARPOL 73/78 (SOPEP)	**EPS-45.1:** Marine vessels (as appropriate to vessel class) will carry on board a Shipboard Oil Pollution Emergency Plan (SOPEP) in accordance with MARPOL 73/78 Annex I – Prevention of Oil Pollution.	**MC-45.1.1:** OVIS report, ABU Marine OE Inspection Checklist, or equivalent record, confirms an approved SOPEP is on board marine vessels >400 T.
			MC-45.1.2: Inspection records (or similar) show drills conducted in accordance with SOPEP.
		EPS-45.2: In the event of a vessel-based spill event,	**MC-45.2:** Records confirm that emergency response

EPO	Control measure	EPS	MC
		emergency response activities will be implemented in accordance with the vessel SOPEP (or equivalent).	activities were implemented in accordance with the vessel SOPEP in the event of a vessel-based spill.
	CM-47: OPEP	**EPS-47.1:** In the event of a Level 2 (or above) oil spill occurring response activities are implemented in accordance with the ABU Consolidated OPEP.	**MC-47.1:** Records confirm the OPEP has been activated and response activities implemented.
		OPEP Refer to the OPEP for environmental performance outcomes, standards and measurement criteria related to emergency management, emergency preparedness, and each response tactic.	
	CM-48a: OSM-BIP	**EPS-48.1:** In the event of a Level 2 (or above) oil spill occurring, the OSM-BIP will be activated and: • operational and scientific monitoring programs are implemented once the specific initiation criteria are met • operational and scientific monitoring programs are implemented within the timeframes outlined in the OSM-BIP • operational and scientific monitoring components are continued until respective termination criteria are met.	**MC-48.1.1:** Records confirm the OSM-BIP has been activated.
			MC-48.1.2: Records confirm that once initiation criteria have been met, operational and scientific monitoring programs were initiated.
			MC-48.1.3: Records confirm that operational and scientific monitoring programs were implemented within the timeframes outlined in the OSM-BIP.
			MC-48.1.4: If any OSM-BIP programs requiring vessels are activated, records demonstrate that CAPL EMT identified vessel availability through existing contracts within 12 hours of OSM-BIP component initiation activation.
			MC-48.1.5: If any OSM-BIP programs requiring aircraft are activated, records demonstrate that CAPL EMT identified aircraft availability

EPO	Control measure	EPS	MC
			through existing contracts within 12 hours of OSM-BIP component initiation activation.
			MC-48.1.6: Records show CAPL EMT mobilised a minimum of one identified, contracted vessel within 24 hours to Onslow, Dampier or Barrow Island (subject to Barrow Island quarantine requirements).
			MC-48.1.7: Records confirm that once termination criteria have been met, operational and scientific monitoring programs were ceased.
		EPS-48.2: OSM-BIP Capability required to implement all operational and scientific monitoring programs are in place to meet the requirements outlined in the OSM-BIP.	**MC-48.2.1:** Records show CAPL obtained monthly capability reports from OSM services provider to demonstrate that the capability outlined in Section 10 of the CAPL OSM-BIP was available throughout the petroleum activity.
	CM-48b: OSM-BIP—Maintain initial water quality / hydrocarbon sampling kits for pre-positioning on Barrow Island and selected vessels, and develop technical procedure for sample collection.		**MC-48.2.2:** Water quality / hydrocarbon sample kits are maintained at Barrow Island and selected vessels, and a technical procedure for sample collection was developed.
	CM-48c: OSM-BIP—Conduct periodical review of existing baseline data sources across receptors within the CAPL OSM Planning Area.	**EPS-48.3:** CAPL maintains available marine baseline data for receptors within their OSM Planning Area as part of a joint-industry marine baseline data assessment project.	**MC-48.3:** Records show that CAPL maintains marine baseline data via the joint-industry marine baseline data assessment project.
	CM-49: EMT	**EPS-49.1:** CAPL core and support EMT members will complete all hazards and oil spill training in accordance with the *Training and Exercise*	**MC-49.1:** Records confirm training is conducted.

EPO	Control measure	EPS	MC
		Program Procedure (Ref. 198).	
		EPS-49.2: CAPL shall maintain an EMT duty roster with a minimum of 10 qualified EMT personnel to fulfil core CAPL EMT positions.	**MC-49.2:** EMT Duty Roster records.
		EPS-49.3: CAPL shall maintain the minimum required trained personnel to fulfil core EMT functions, including source control roles, as per Appendix F of the OPEP.	**MC-49.3:** Records confirm the minimum required personnel are trained.
		EPS-49.4: During any oil spill response, EMT support personnel, including mutual aid personnel, joining the CAPL EMT will be provided with training in accordance with the *Training and Exercise Program Procedure* (Ref. 198) before they join the EMT.	**MC-49.4:** Training/induction records.
		EPS-49.5: CAPL shall maintain service agreements with oil spill response organisations and membership to mutual aid frameworks (as per Section 10.3.9.7) that have capabilities to support a response to an oil spill event.	**MC-49.5:** Records confirm that service agreements and memberships to mutual aid frameworks are in place.

8.16 Unplanned release—LOWC

8.16.1 source of aspect

Activities identified as having the potential to result in a LOWC are:

- unplanned hydrocarbon influx, breach of well fluids, or loss of hydrostatic barrier during drilling, completion, well intervention and/or well abandonment activities.

8.16.2 Scenario

Drilling subsea wells introduce the potential for an unplanned release of gas and condensate. CAPL categorise well control into two categories:

- loss of well integrity—where integrity of the well has been compromised, but the well remains under control (which would prompt a Level 1 or Level 2 well control emergency response)
- loss of effective well control—where control of the well has been lost (which would require a Level 3 well control emergence response).

Well control events are a feasible risk during well drilling campaign, well abandonment or, well intervention activities and have the potential to occur by:

- dropped objects onto the well envelope (potential damage to wellhead)
- mechanical failure (including failure of wellhead components or cement plugs)
- corrosion (corrosion leading to loss of casing integrity)
- loss of effective well control (including hydrocarbon influx or breach of well fluids to surface)
- loss of effective well control (unable to shear pipe in an emergency situation)
- loss of effective well control (loss of hydrostatic barrier)
- loss of station keeping (anchoring/mooring failure with potential damage to wellhead)
- operating error (such as incorrect operation of well control systems).

Risk controls in place during drilling, completions and intervention activities include (but are not limited to) design and construction of primary and secondary well integrity barriers, fluids programs, casing program, overall, well design and pressure-control equipment (i.e. BOP). These are all supported by Chevron global technical standards containing requirements related to well control and WellSafe well design certification.

Based upon the feasible risks identified during activities within scope of this EP (i.e. well drilling campaign, and well intervention activities), a loss of effective well control was deemed to present the worst-case credible spill scenario and has been used as the basis for the following risk assessment.

Volume

The *Wells Worst Case Discharge Calculation and Relief Well Planning Standard Operational Procedure* (Ref. 197) describes the methodology for estimating a worst case discharge (WCD) for a loss of effective well control event.

The methodology aligns with the *Australian Offshore Titleholders Source Control Guideline* (Ref. 201) and the *Society of Petroleum Engineers (SPE) Technical Report – Calculation of Worst-Case Discharge* (Ref. 508).

The basis for the WCD calculation also includes the following well flow characteristics:

- open hole across all exposed flow zones
- no mechanical obstruction in the hole (e.g. no pipe, tools, or debris to choke the flow)
- no sand bridging of the wellbore, hydrates, or washouts
- zero mechanical skin or geometric skin
- no BOP attached with full WCD fluid evacuation to mudline.

Based on the above WCD calculation method, a subsea release of ~48,862 m^3 of Geryon condensate within the G&E fields was selected as the worst-case credible spill scenario for the drilling campaign.

Duration

Response time models (RTMs) for G&E wells indicate it is reasonable to expect that the well could be killed, via drilling a relief well, within an approximate 13-week (90 days) period. Therefore, this 90-days was used as the duration for the worst-case credible spill scenario. The RTMs take into account the preparation, assessment, and approval of the Safety Case revisions for the relief well rig and support vessels. The RTM is based on a rig being available on the NWS, and activated by the Australian Energy Producers (AEP) Memorandum of Understanding (MoU) (refer to Section 10.3.9.7 for oil spill response resourcing arrangements). Further details on the RTM are provided in the Source Control Emergency Response Plan (SCERP) (Ref. 196).

The SCERP (see Section 10.3.9.1.1) has been specifically developed to align with relevant industry guidance and standards, including the AEP *Australian Offshore Titleholders Source Control Guideline* (Ref. 201), IOGP's *Source Control Emergency Response Planning Guide for Subsea Wells* (Ref. 202) and NOPSEMA's *Source control planning and procedures Information Paper* (Ref. 203).

The SCERP contents satisfy the information recommendations in these industry documents and include topics such as a plume and dispersion study, capping stack landing analysis, capping stack selection, well to BOP to cap interface analysis, capping stack and ROV interfaces, capping stack mobilisation, and deployment planning, WCD calculation, relief well locations and designs, relief well dynamic well kill plan, relief well long lead inventory management, SIMOPS planning, debris clearance plan, subsea dispersant operations and supply planning, source control Incident Management Team (IMT) arrangements and notifications, mutual aid arrangements via AEP, wellhead structural integrity analysis, source control and emergency response plan training and drills, response vessels and tracking, and response time modelling for source control strategy.

The SCERP (Ref. 196) contains all steps necessary to affect the direct intervention on a well that has experienced LOWC, with the intent to halt or control the release of hydrocarbons to the environment. The SCERP also provides information to align source control response expectations within the Wells function between the Australian Business and the Chevron Global Wells Source Control Team, based in Houston.

As per the SCERP and associated RTM, drilling of a relief well would be the progressed concurrently with capping stack deployment (see Section 9.4.3 for capping stack deployment timeframes). The detailed and well specific relief well planning will be contained in a *WCD Calculation and Relief Well Planning SOP* (Ref. 197).

In addition to the detailed Relief Well Plan, the SCERP (Ref. 196) summarises relief well rig specifications, arrangements for monitoring the availability of appropriate rig units and the capabilities required for the rig mud pumps. Other specifications to be evaluated include water depth capability, maximum hook load, BOP pressure rating and rig choke and kill line size, which will provide a limit on the kill rate that can be delivered.

8.16.3 Oil spill modelling

RPS undertook stochastic and deterministic spill modelling (Ref. 509) to inform the risk assessment associated with a LOWC at the G&E field. The spill modelling was completed for a 48,862 m^3 subsea release of condensate over 90 days at the G&E DC (Table 8-76). Table 8-76 provides a summary of the oil spill the model settings.

Oil spill modelling was performed using a near-field plume model for the subsea release: OILMAP Deep, followed by a three-dimensional trajectory and fates model: SIMAP. OILMAP-Deep was used to simulate the near-field behaviour of the subsea gas-condensate release; and 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 hydrocarbon properties

The modelling study was carried out in stages. First, a 10-year current dataset that captures the combined influence of large-scale ocean and nearshore tidal currents. Second, OILMAP-Deep was used to simulate the near-field behaviour of the subsea gas-condensate release. Finally, the resulting metocean conditions, and detailed hydrocarbon characteristics were applied as inputs to the three-dimensional oil spill model SIMAP to simulate the drift, spread, weathering, and fate of the spilled oil (Ref. 509).

The exposure values used for this study are the same as those described in Section 8.15.3 and Table 8-69.

Table 8-76: LOWC credible spill scenario inputs

Parameter	Details
Release Location	G&E DC
Latitude	19° 56’ 25.5” S
Longitude	114° 53’ 6.7” E
Water Depth	1,220 m
Oil type	Geryon condensate
Simulation spill type	Subsea
Simulation spill volume	48,862 m^3
Simulation spill duration	90 days
Total simulation duration	104 days
Number of randomly selected spill simulation start times	100 per season (300 total)
Seasons modelled	Summer (September to the following March) Transitional (April and August) Winter (May to July)

Hydrocarbon properties

The physical properties and boiling point distributions for the condensate are presented in Table 8-77.

Geryon condensate is a light-persistent oil. In the event of a subsea release, the gas and condensate initially behave as a jet, which dissipates in the water column over a short distance. 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 (Ref. 509). The amalgamated gas and condensate would propel rapidly upward from the seabed to a depth of ~641 m below the sea surface (Ref. 509). At the trapping depth, condensate droplets of varying sizes separate from the plume and continue to rise independently through the water column under buoyancy, resulting from the density difference between the condensate and water, while also being transported by ambient currents.

Upon reaching the sea surface, the condensate's physical properties, including its low viscosity, indicate that this condensate will spread quickly when released and will form a thin to low thickness film on the sea surface, increasing its rate of evaporation (Ref. 509).

Generally, about 31.5% (by mass) of the condensate components should evaporate within the first 12 hours (BP <180°C); a further 27.1% of the semi-volatiles should evaporate within the first 24 hours (180°C < BP <265°C); and low volatile portion (~31.7%) should evaporate over a longer period (265°C < BP < 380°C). Approximately 9.7% (by mass) of the condensate will not evaporate though will be subject to relatively slow degradation over time (Ref. 509).

Soluble, aromatic hydrocarbons contribute approximately 2.9% (by mass) of the whole oil. For this condensate they are all contained in the volatile fractions, which are highly soluble (Ref. 509).

The heavier components for the condensate, specifically the low volatile and persistent portions, will have a strong tendency to become entrained into the water column in the presence of moderate winds (>10 knots) and in turn breaking waves, however, it can re-surface under calm conditions (<10 knots) (Ref. 509).

Table 8-77: Physical properties and boiling point ranges for Geryon condensate

<table>
<tr><th>Characteristics</th><th colspan="5">Value</th></tr>
<tr><td>Density</td><td colspan="5">810 kg/m^3 at 15 C</td></tr>
<tr><td>Dynamic viscosity</td><td colspan="5">5.2 cP at 15 C</td></tr>
<tr><td>Pour point</td><td colspan="5">-20 C</td></tr>
<tr><td>Surface tension</td><td colspan="5">22 dyne/cm</td></tr>
<tr><td>API gravity</td><td colspan="5">42.7</td></tr>
<tr><td>Classification</td><td colspan="5">Group II - Light-persistent</td></tr>
<tr><td rowspan="4">Boiling point</td><td rowspan="2">Component</td><td>Volatile
<180°C
C_4 to C_{10}</td><td>Semi-volatile
180–265°C
C_{11} to C_{15}</td><td>Low volatility
265–380°C
C_{16} to C_{20}</td><td>Residual
>380°C
>C_{20}</td></tr>
<tr><td colspan="3">Non-persistent</td><td>Persistent</td></tr>
<tr><td>% of total</td><td>31.5%</td><td>27.1%</td><td>31.7%</td><td>9.7%</td></tr>
<tr><td>% of aromatics</td><td>2.9%</td><td>0%</td><td>0%</td><td>0%</td></tr>
</table>

Modelling outputs

Outcomes of the stochastic modelling undertaken by RPS (Ref. 509) are provided in the following:

- visual representation of areas at risk of exposure to surface, dissolved, entrained, and shoreline accumulated oil at each of the relevant exposure values (Figure 8-3)

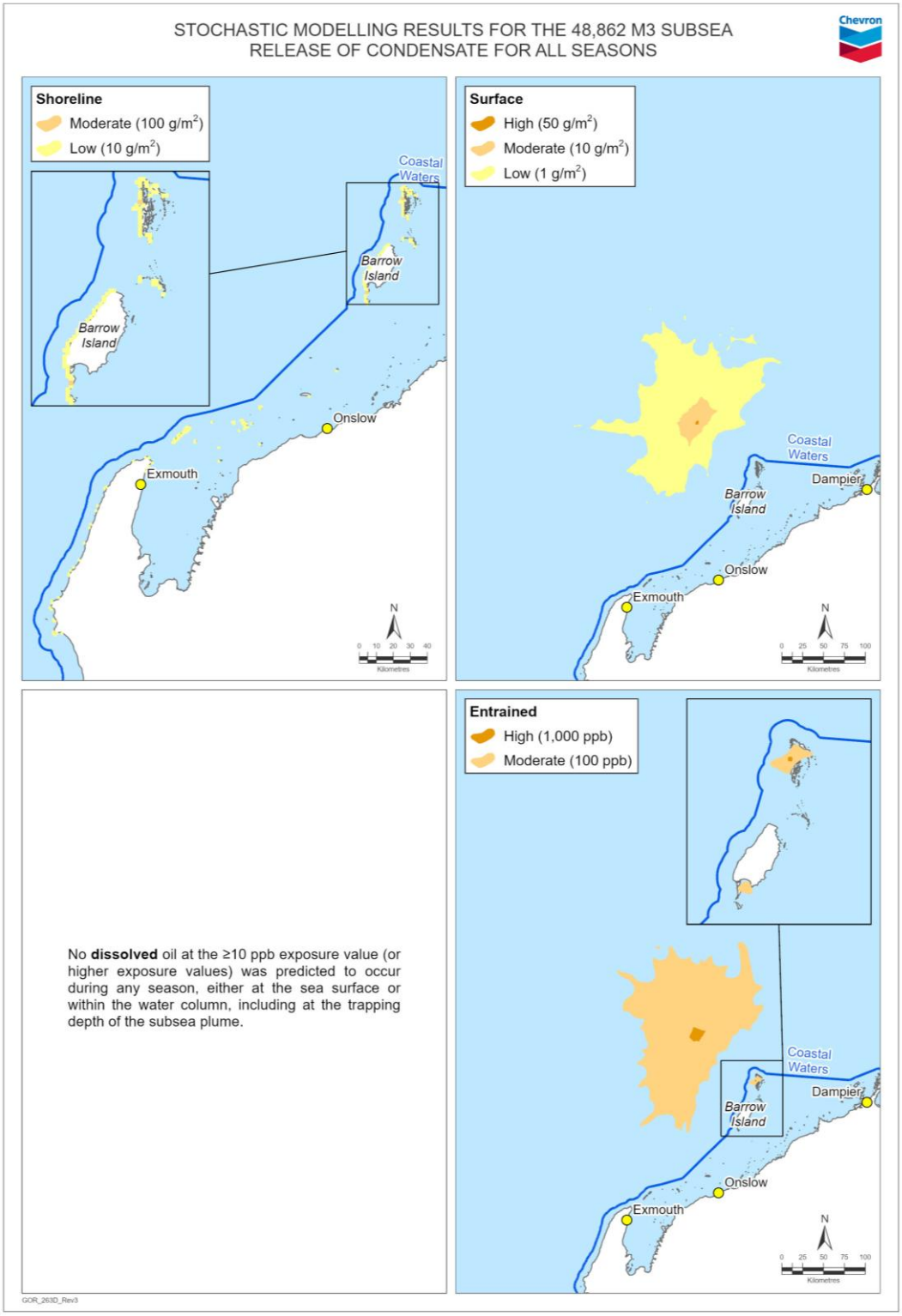
- an overall summary of stochastic modelling results (below) and a summary of the maximum predicted exposures and/or concentrations to key individual receptors (Table 8-78).

RPS analysed the stochastic modelling results to determine the worst-case deterministic (i.e. single simulation) runs that represented particular criteria (e.g. largest swept area of surface oil). The outcomes from the deterministic modelling analyses are summarised in Table 8-79.

Stochastic modelling outputs from RPS (Ref. 509) are summarised below:

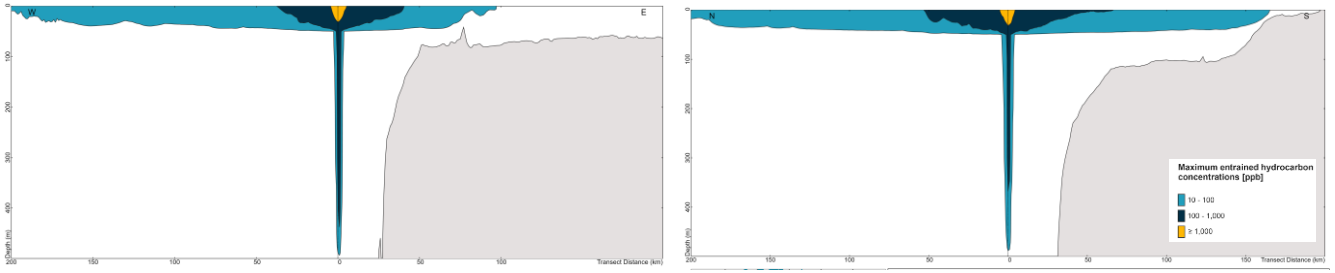
- shoreline
  - shoreline accumulation at the low (10 g/m^2) exposure value was predicted at the following locations:
    - along the west coast of Barrow, Middle and Boodie islands (transitional and winter season), Montebello Island (summer), several Pilbara inshore islands; and parts of the western and northern coasts of the North West Cape (all seasons)
    - the probability of accumulation ranged from 23% (transitional) to 45% (winter)
    - minimum time before oil accumulation above this exposure value ranged from 12.77 days (winter) to 22.36 days (transitional)
    - maximum length of shoreline above this exposure values ranged from 5.8 km (transitional) to 54.2 km (summer).
  - a very low (1%) probability of shoreline accumulation at the moderate (100 g/m^2) exposure value was predicted during summer only at the Barrow and Montebello island groups
    - the minimum time before oil accumulated above this exposure value was ~28.6 days, and the maximum total length was 1.9 km
  - the maximum volume of oil ashore ranged from 2.4 m^3 (transitional) to 24.8 m³ (summer)
  - no shoreline accumulation at the high (≥1,000 g/m^2) exposure value was predicted during any season
- surface
  - the maximum distances of surface oil from the release location to the:
    - low exposure value (≥1 g/m^2) ranged between 126.9 km (transitional) to 145.1 km (winter)
    - moderate exposure value (≥10 g/m^2) ranged between 28.7 km (winter) and 29.6 km (transitional)
    - high exposure value (≥50 g/m^2) remained within 2 km from the release location for all seasons
  - no surface exposure above the 10 g/m^2 moderate exposure value was predicted for any protected marine area during any season; there was a low probability (0–6%) of surface oil exposure above the low exposure value (1 g/m^2) within the Montebello AMP
  - no surface oil above the low exposure value (1 g/m^2) was predicted in State waters during any season

- dissolved
  - no dissolved oil at the ≥10 ppb exposure value (or higher exposure values) was predicted to occur during any season, either at the sea surface or within the water column, including at the trapping depth of the subsea plume
- entrained
  - entrained oil at the moderate (≥100 ppb) exposure value was predicted to occur during all seasons. However, concentrations at this exposure value were predominantly confined to the upper water column and surface layers, except in the immediate vicinity of the release location, where the plume extended vertically through the water column (Figure 8-4)
  - entrained oil at the high (≥1,000 ppb) exposure value was predicted to occur during all seasons. However, concentrations at this exposure value were limited to the surface layers (<30 m) (Figure 8-4)
  - discrete patches of entrained oil above these exposure values were predicted to occur within State waters (e.g. around Bandicoot Bay on Barrow Island, and within shallow waters in the northern section of Montebello Islands)
  - the State Barrow Island and Montebello Island Marine Parks were predicted to be contacted with entrained oil at the moderate exposure value with a probability of 8% during summer only
  - no AMPs were predicted to be exposed to entrained oil at the moderate or high exposure values.

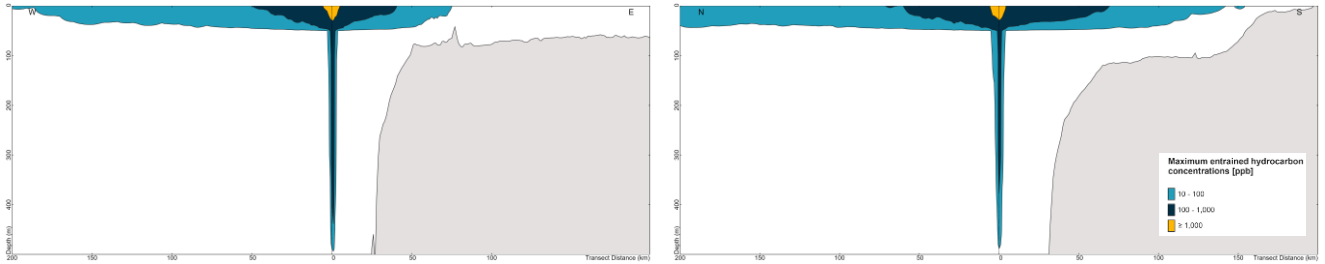


Note: Exposure values not presented in the figure were not predicted.

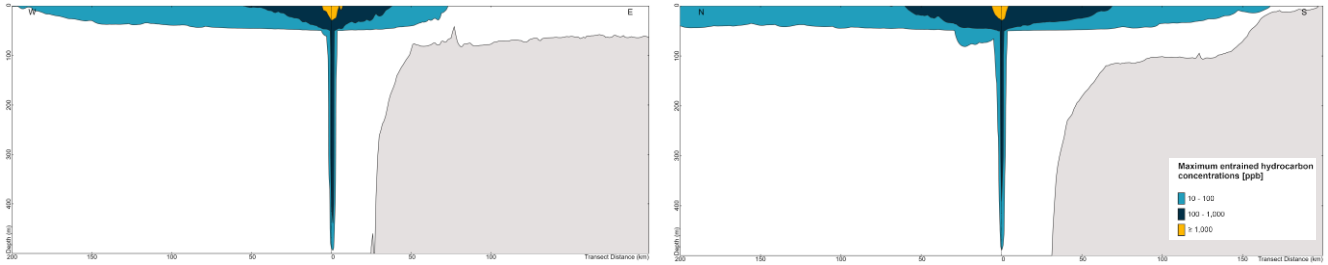
Figure 8-3: Zones of potential exposure to surface, dissolved, entrained, and shoreline accumulated oil based on 300 simulations for a 48,862 m^3 subsea release of condensate



(a) Maximum entrained hydrocarbon concentrations during summer



(b) Maximum entrained hydrocarbon concentrations during transitional



(c) Maximum entrained hydrocarbon concentrations during winter

Image source: RPS (Ref. 509)

Figure 8-4: Maximum depth of the predicted entrained hydrocarbon exposure based on 300 simulations for a 48,862 m^3 subsea release of condensate

Table 8-78: Maximum predicted probability of exposure[138] and/or concentrations (from any season) to individual receptors based on stochastic modelling of 48,862 m³ subsea release of condensate

Value or sensitivity (Receptor)	Surface oil			Dissolved oil				Entrained oil			Shoreline accumulated oil			
	Maximum probability (%) of exposure			Maximum concentration (ppb)	Maximum probability (%) of exposure			Maximum concentration (ppb)[139]	Maximum probability (%) of exposure		Maximum accumulated concentration (g/m²)	Maximum probability (%) of exposure		
	≥1 g/m²	≥10 g/m²	≥50 g/m²		≥10 ppb	≥50 ppb	≥300 ppb		≥100 ppb	≥1,000 ppb		≥10 g/m²	≥100 g/m²	≥1,000 g/m²
Australian Marine Parks														
Montebello	6	–	–	–	–	–	–	–	–	–	N/A			
State marine protected areas														
Barrow Island marine park	–	–	–	–	–	–	–	341.4	8	–	N/A			
Montebello Islands marine park	–	–	–	–	–	–	–	1,998.5	8	8	N/A			
KEFs														
Ancient coastline at 125 m depth contour	8	–	–	–	–	–	–	172.9	NIE (SB)	–	N/A			
Continental slope demersal fish communities	79	1	–	–	–	–	–	390.5	NIE (NSB)	–	N/A			
Exmouth Plateau	3	–	–	–	–	–	–	171.1	NIE (SB)	–	N/A			
Reefs, banks, and shoals														
Montebello Shoals	–	–	–	–	–	–	–	202.2	NIE (SB)	–	N/A			
BIAs for protected marine fauna														
Humpback whale	5	–	–	–	–	–	–	1,998.5	29	8	N/A			
Pygmy blue whale	100	100	23	–	–	–	–	2,477.9	100	100	N/A			
Flatback turtle	23	–	–	–	–	–	–	1,998.5	49	8	N/A			
Green turtle	–	–	–	–	–	–	–	1,998.5	8	8	N/A			
Hawksbill turtle	–	–	–	–	–	–	–	1,998.5	8	8	N/A			
Loggerhead turtle	–	–	–	–	–	–	–	1,998.5	8	8	N/A			
Whale shark	19	–	–	–	–	–	–	288.5	45	–	N/A			
Fairy tern	–	–	–	–	–	–	–	1,998.5	8	8	N/A			
Lesser crested tern	–	–	–	–	–	–	–	1,998.5	8	8	N/A			
Roseate tern	–	–	–	–	–	–	–	1,998.5	8	8	N/A			
Wedge-tailed shearwater	100	100	23	–	–	–	–	2,477.9	100	100	N/A			
HCTS of marine turtles														
Flatback turtle	30	–	–	–	–	–	–	1,998.5	53	8	N/A			
Green turtle	–	–	–	–	–	–	–	1,998.5	8	8	N/A			
World Heritage property														
No World Heritage listed properties were identified within the Hydrocarbon EMBA (Section 5.6)[140].											N/A			

[138] Where – = no contact predicted, NIE (SB) = spatial overlap based on plan view, but no interaction expected as value or sensitivity is a seabed based receptor; NIE (NSB) = spatial overlap based on plan view, but no interaction expected as value or sensitivity is a near-seabed based receptor), N/A = not applicable.

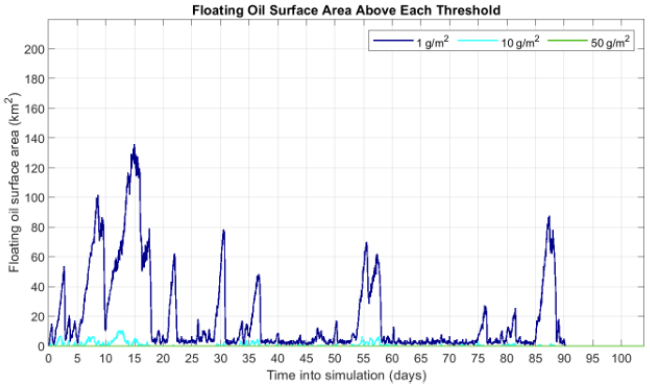
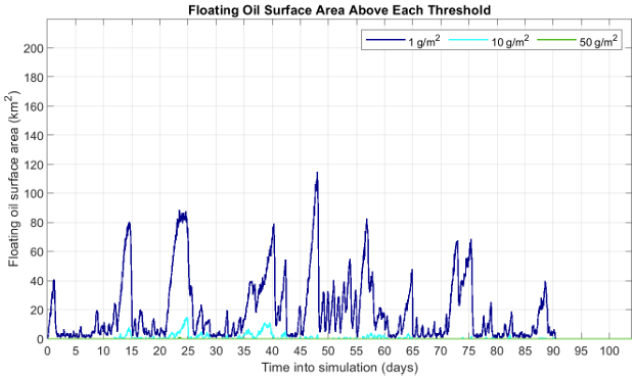
[139] As identified in Section 8.16.3 and Figure 8-4, concentrations at the high (≥1,000 ppb) exposure value were limited to the surface layers (<30 m), while concentrations at the moderate (≥100 ppb) exposure value were limited to the surface layers except in the immediate vicinity of the release location, where the plume extended vertically through the water column.

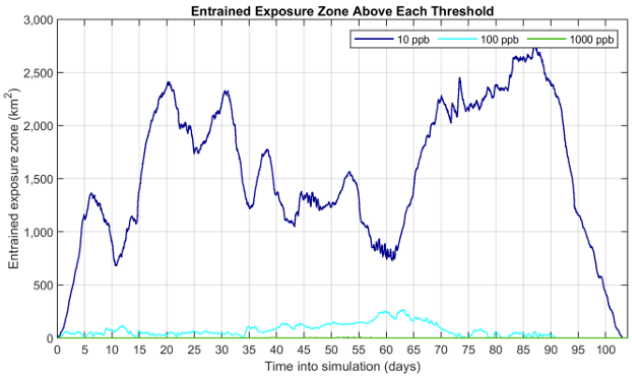
[140] The Hydrocarbon EMBA defined in Section 5.1 is based on a smoothed outer boundary to provide a conservative approach to identifying and describing environmental values and sensitivities. Section 5.6 shows the Hydrocarbon EMBA extending into The Ningaloo Coast World Heritage property, National and Commonwealth Heritage places, and the Learmonth Air Weapons Rage Facility Commonwealth Heritage place. The stochastic modelling for this spill scenario (48,862 m³ subsea release of condensate) does

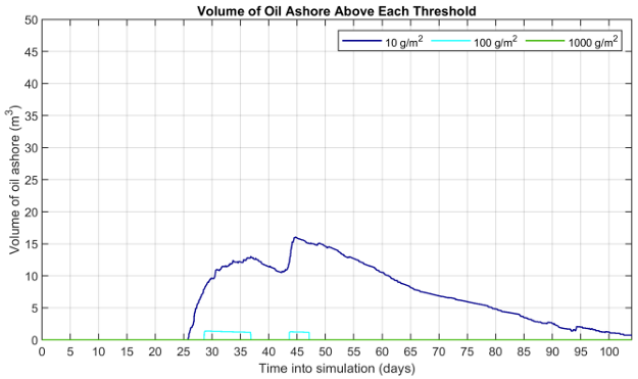
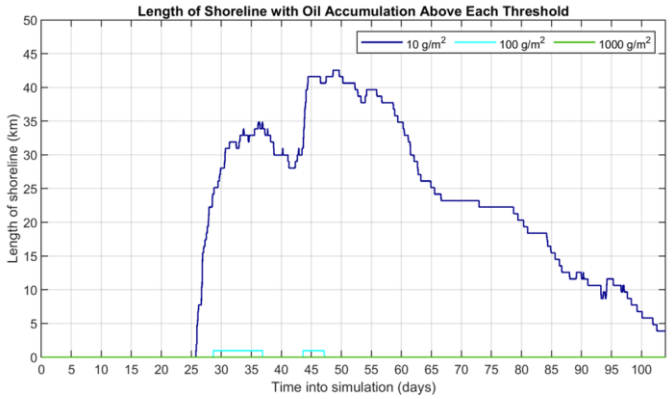
Value or sensitivity (Receptor)	Surface oil			Dissolved oil				Entrained oil			Shoreline accumulated oil			
	Maximum probability (%) of exposure			Maximum concentration (ppb)	Maximum probability (%) of exposure			Maximum concentration (ppb)[139]	Maximum probability (%) of exposure		Maximum accumulated concentration (g/m^2)	Maximum probability (%) of exposure		
	≥1 g/m^2	≥10 g/m^2	≥50 g/m^2		≥10 ppb	≥50 ppb	≥300 ppb		≥100 ppb	≥1,000 ppb		≥10 g/m^2	≥100 g/m^2	≥1,000 g/m^2
National Heritage place														
No National Heritage listed places were identified within the Hydrocarbon EMBA (Section 5.6)[140].											N/A			
Commonwealth Heritage place														
No Commonwealth Heritage listed places were identified within the Hydrocarbon EMBA (Section 5.6)[140].											N/A			
State waters														
WA State waters	–	–	–	–	–	–	–	1,998.5	8	8	N/A			
Shorelines														
WAMOPRA Shoreline Cell 121.	N/A										12.9	1	–	–
WAMOPRA Shoreline Cell 122.	N/A										17.2	4	–	–
WAMOPRA Shoreline Cell 123.	N/A										14.6	2	–	–
WAMOPRA Shoreline Cell 124.	N/A										16.2	4	–	–
WAMOPRA Shoreline Cell 125.	N/A										12.5	3	–	–
WAMOPRA Shoreline Cell 126.	N/A										25.0	8	–	–
WAMOPRA Shoreline Cell 127.	N/A										25.0	5	–	–
WAMOPRA Shoreline Cell 318.	N/A										107.4	11	1	–
WAMOPRA Shoreline Cell 319.	N/A										65.9	11	–	–
WAMOPRA Shoreline Cell 320.	N/A										42.9	9	–	–
WAMOPRA Shoreline Cell 321.	N/A										116.8	13	1	–
WAMOPRA Shoreline Cell 324.	N/A										10.8	1	–	–
WAMOPRA Shoreline Cell 325.	N/A										10	1	–	–
WAMOPRA Shoreline Cell 326.	N/A										47.6	19	–	–
WAMOPRA Shoreline Cell 327.	N/A										13.7	1	–	–
WAMOPRA Shoreline Cell 328.	N/A										13.7	1	–	–
WAMOPRA Shoreline Cell 329.	N/A										33.4	35	–	–

not predict exposure to any Heritage protected property or place occurring at or above the relevant exposure values for the Hydrocarbon EMBA (Table 8-69). The stochastic modelling did predict exposure at the low (≥10 ppb) entrained exposure value; this exposure value is associated with the planning area for operational and scientific monitoring as described in Section 9.

Table 8-79: Summary of deterministic modelling analyses for surface, dissolved, entrained, and shoreline accumulated oil based on a 48,862 m³ subsea release of condensate

Variable	Deterministic scenario	
Surface oil	**Largest swept area of surface oil ≥10 g/m²**	**Largest swept area of surface oil ≥50 g/m²**
Season	Transitional	Winter
Peak volume (m^3) of surface oil and day of occurrence	680.8 (Day 14)	693.9 (Day 25)
Volume (m^3) of surface oil at end of simulation (Day 104)	2.4	17.0
Predicted area of surface oil above each exposure value *Image source: RPS (Ref. 509)*		
Dissolved oil	**Largest area of dissolved oil ≥10 ppb**	**Largest area of dissolved oil ≥50 ppb**
N/A (no dissolved oil at the ≥10 ppb exposure value [or higher exposure values] was predicted to occur during any season) either at the sea surface or within the water column, including at the trapping depth of the subsea plume.		
Entrained oil	**Largest area of entrained oil ≥100 ppb**	**Largest area of entrained oil ≥1,000 ppb**
Season	Winter	
Peak volume (m^3) of entrained oil and day of occurrence	4,914.4 (Day 60)	

Variable	Deterministic scenario	
Volume (m^3) of entrained oil at end of simulation (Day 104)	2,475.5	
Predicted area of entrained oil at each exposure value *Image source:* *RPS (Ref. 509)*		
Shoreline accumulated oil	**Largest (total) volume of shoreline oil accumulation**	**Longest length of shoreline oil accumulation ≥100 g/m²**
Season	Summer	
Peak volume (m^3) of shoreline oil and day of occurrence	17.5 (Day 45)	
Volume (m^3) of shoreline oil at end of simulation (Day 104)	5.4	N/A

Variable	Deterministic scenario	
Predicted volume of shoreline accumulation above each exposure value *Image source:* *RPS (Ref. 509)*		N/A
Predicted longest length (km) of oil ashore	N/A	1
Predicted longest shoreline above each exposure value *Image source:* *RPS (Ref. 509)*	N/A	

8.16.4 Environmental risk evaluation

Unplanned release of condensate due to a LOWC may result in:

- change in water quality
- change in sediment quality
- potential adverse effects to BCH
- potential adverse effects to coastal communities and habitats
- potential adverse effects to marine fauna
- potential change to the functions, interests and activities of other marine users
- potential changes to values and sensitivities of protected areas
- potential changes to tangible cultural heritage values.

8.16.4.1 Consequence evaluation

8.16.4.1.1 Risk: Change in water quality

An unplanned release of condensate from a LOWC may result in a reduction in water quality in waters surrounding the release location.

Impacts to water quality are expected to be localised and/or short-term, consistent with the weathering properties of the condensate. Following release to the marine environment, condensate spreads quickly and evaporates rapidly when exposed to air, up ~90% may evaporate over several days depending on wind and wave conditions affecting how much is entrainment into the water column (Section 8.16.2; Ref. 509).

Deterministic modelling for the largest swept area of surface oil at ≥10 g/m^2 may predicted that oil at this concentration may be present for ~90 days following the spill event with a peak area of coverage of <10 km^2 (Ref. 509).

Deterministic modelling for the largest entrained oil >10 ppb indicated that entrained oil above this concentration may be present for ~90 days following the spill event, with a peak area of coverage of ~250 km^2. No dissolved hydrocarbon concentrations ≥10 ppb were predicted.

The release of condensate would be subject to evaporation (when exposed to air), dispersion, dilution, and physical and biological degradation. The condensate is a light-persistent and low viscosity oil, indicating that it will spread quickly when released and will form a thin to low thickness film on the sea surface, increasing its rate of evaporation (Ref. 509). Based on the predicted magnitude, spatial extent, and duration of an unplanned release of MDO, potential changes in water quality are expected to occur and for short-term durations. Therefore, potential change in water quality due to a MDO spill has been evaluated as Minor (5).

8.16.4.1.2 Risk: Change in sediment quality

An unplanned release of condensate from a LOWC may result in a reduction in sediment quality within the Hydrocarbon EMBA due to contamination from entrained or shoreline accumulated oil (no dissolved oil predicted to occur).

Studies of hydrocarbon concentrations in deep-sea sediments in the vicinity of a major well blowout indicate hydrocarbon from the blowouts can be incorporated into marine sediments; the proposed mechanisms for this contamination include

sedimentation of hydrocarbons and direct contact between submerged plumes and the seabed (Ref. 511). However, spill modelling (Ref. 509) showed that in the event of a LOWC, the amalgamated gas and condensate would propel rapidly upward from the seabed and that the oil breaks into smaller droplets. As a result, the extent of any potential impacts to the seabed at and surrounding the release site would be confined to a localised footprint.

Entrained oil above ecologically relevant exposure values (≥100 ppb) are generally not predicted to occur within State waters; and as such for most of the Hydrocarbon EMBA (which is in deep offshore waters), no impact to marine sediment quality from entrained oil is predicted. The exception to this is discrete areas of entrained oil exposure near some offshore islands (e.g. Barrow, Montebello). Similarly, accumulated shoreline oil above ecologically relevant exposure values (≥100 g/m^2) was predicted to occur in similar areas (Section 8.16.3). Such entrained and/or shoreline oil exposure may lead to reduced marine sediment quality by adherence of the oil to benthic of shoreline sediments.

The released condensate would be subject to evaporation (when exposed to air), dispersion, dilution, and physical and biological degradation. Based on the predicted magnitude and spatial extent of exposure, potential changes in sediment quality are expected to occur for short-term durations. Therefore, potential change in sediment quality due to a LOWC event have been evaluated as Minor (5).

8.16.4.1.3 Risk: Potential adverse effects to BCH

Offshore benthic habitats (e.g. coral, sponges, seagrass, macroalgae)

Direct contact of hydrocarbons to subtidal habitats can cause smothering. The effects of physical contact on subtidal habitats are similar, and studies have shown that it can cause sublethal stress and reduced growth rates in seagrass (Ref. 465; Ref. 466), act as a barrier to diffusion of CO_2 across cell walls in macroalgae (Ref. 467), and a decline in metabolic rate, bleaching or partial mortality in corals (Ref. 468; Ref. 469) and impair respiration and photosynthesis by symbiotic zooxanthellae (Ref. 470; Ref. 471). The recovery of benthic habitats can be slow, with studies following the DWH incident showing long-term non-acute effects of the spill on coral colonies seven years after the event (Ref. 472).

The spill modelling (Section 8.16.3; Ref. 509) showed that in the event of a LOWC, the amalgamated gas and condensate would propel rapidly upward from the seabed and that the oil breaks into smaller droplets. These droplets typically either rise entirely to the surface or remain within the upper water column. Therefore, impacts to BCH within the deep offshore waters of the Hydrocarbon EMBA are typically not anticipated. However, geomorphic features located within the water column, such as banks and shoals, may be impacted by dissolved or entrained hydrocarbons.

Rankin Bank occurs within the Hydrocarbon EMBA, ~70 km north-east of the OA. Rankin Bank is considered a regionally significant habitat (Section 5.3.1.2); types of BCH include coral reef, macroalgae, and sponges. Stochastic modelling did not predict exposure to entrained oil above the moderate (≥100 ppb) exposure value or exposure to dissolved oil (Ref. 509). Therefore, potential impacts to BCH associated with banks and shoals from an unplanned release of condensate due to a LOWC are not predicted to occur.

Nearshore benthic habitats (e.g. coral, sponges, seagrass, macroalgae)

Smothering of benthic habitat communities within shallow water environments may occur if a surface slick or in-water entrained oil above exposure value occurs in the intertidal area.

No surface exposure at the ≥10 g/m^2 exposure value was predicted at any protected marine area or within State waters during any season. Therefore, impacts from smothering within intertidal areas due to surface oil is not expected to occur.

The spill modelling (Section 8.16.3; Ref. 509) showed that in the event of a LOWC, the amalgamated gas and condensate would propel rapidly upward from the seabed and that the oil breaks into smaller droplets. These droplets typically either rise entirely to the surface or remain within the upper water column. Therefore, impacts to BCH within the deep offshore waters of the Hydrocarbon EMBA are typically not anticipated. However, geomorphic features located within the water column, such as banks and shoals, may be impacted by dissolved or entrained hydrocarbons. Stochastic modelling predicted a relatively low probability of entrained oil at >100 ppb around Bandicoot Bay on Barrow Island, and within shallow waters in the northern section of Montebello Islands (8%). Based on the stochastic modelling, the maximum residence time of entrained oil exposure ≥100 ppb within these locations is predicted to be ~36 hours. Coral, seagrass, and macroalgae habitats are known to occur around these islands (Section 5.3.2).

As the extent and duration of exposure to nearshore environments is expected to be limited the potential for environmental impacts would also be limited.

Based on an assessment of the predicted magnitude and duration of entrained oil from an unplanned release of condensate, it is expected that only a small proportion of any coral habitat is likely to be exposed above the exposure value that may result in alteration to these habitats. Therefore, the potential impact was ranked as Minor (5).

8.16.4.1.4 Risk: Potential adverse effects to coastal communities and habitats

Shoreline hydrocarbons can have smothering and toxic effects on mangroves and intertidal mudflats. Acute and chronic impacts to the health of mangrove communities can occur via pneumatophore smothering and exposure to the toxic volatile fraction of the hydrocarbons (Ref. 468). Intertidal mudflats, which are typically sheltered and have a large surface area for oil absorption, can trap oil, potentially causing toxicity impacts to infauna. Intertidal mudflats are very sensitive to oil pollution because the oil enters lower layers of the mudflats where a lack of oxygen prevents the oil from decomposing (Ref. 468).

As identified in Section 5.3.2, coastal habitats within the Hydrocarbon EMBA include rocky coasts, sandy beaches, tidal flats and mangroves. Coastal and marine baseline studies undertaken by CAPL (Ref. 43) identified that there are no mangrove stands on the west coast of Barrow Island, where the Hydrocarbon EMBA intersect with the coast; however there may be some intersect with the isolated patches of mangroves on the Montebello Islands.

Shoreline accumulation above the 100 g/m^2 exposure value was predicted to occur only during summer at Barrow and Montebello islands, with a low probability of occurrence (1%). The deterministic model for the longest length of shoreline accumulation area above ≥100 g/m^2 predicted the largest volume of oil ashore as 17.5 m^3, and the maximum length of shoreline exposed was 1.9 km occurring ~45 days after the spill commenced.

Based on an assessment of the predicted magnitude of shoreline accumulation from an unplanned release of condensate from a LOWC, only a small proportion of coastal habitat is likely to be exposed. However, it is acknowledged that offshore island habitats are important for fauna (e.g. turtles, birds), or that particular habitats (e.g. mangroves) are considered regionally significant. Therefore, alteration of coastal communities and habitats from a LOWC was ranked as a Minor (5) consequence.

8.16.4.1.5 Risk: Potential adverse effects to marine fauna

Marine mammals

Marine mammals may be exposed to hydrocarbons from an oil spill at both the surface and within the water column, either through contact, inhalation, and/or ingestion (Ref. 425; Ref. 426).

Marine mammals are highly vulnerable to oil spills, although the effects at both individual and population levels are not fully understood (Ref. 427). The degree of exposure is strongly influenced by their morphology, biological behaviours and distribution, as well as the origin and evolution of the spill (Ref. 427). For example, marine mammals that feed on prey near the ocean surface are more likely to inhale oil following a spill, compared to deep-diving species like sperm whales, which spend extended periods at depth (Ref. 427; Ref. 426). Benthic feeders may ingest sunken oil while feeding in areas of contaminated sediment. Cetacean species that feed on invertebrates are at risk of indirect oil ingestion, as many invertebrates can accumulate PAHs without metabolising them (Ref. 426).

Baleen whales are vulnerable due to blowhole breathing, surface filter feeding, and invertebrate prey (Ref. 426), killer whales may also be at risk due to population sizes, complex social structure, slow reproductive turnover, and dietary specialisation (Ref. 426) The effect of oil on cetacean skin is likely minor; however, prolonged contact with oil can lead to long-term coating that may interfere with filtering capacity in baleen whales (Ref. 428). Toothed whales and dolphins may be susceptible to ingestion of in-water oil as they gulp feed at depth. However, as highly mobile species, in general it is not expected that these animals will be constantly exposed to concentrations of hydrocarbons in the water column for continuous durations (e.g. >48–96 hours) that would lead to chronic effects.

After an oil spill, the highest concentrations of volatile hydrocarbons are typically found at the air-water interface (Ref. 429). If compounds from the oil get into the bloodstream of marine mammals, they can cause neurological disorders, physiological damage and impacts on the endocrine system, with the consequent effects on reproductive success (Ref. 430; Ref. 431; Ref. 432; Ref. 433).

Following the DWH oil spill, a population of bottlenose dolphins experienced increased mortality, reproductive failure, and a rise in disease incidence (Ref. 427; Ref. 434). Although baseline data from the spill location were limited, combined models extrapolated from detailed studies of nearshore bottlenose dolphin populations with predictions of offshore cetacean survival and recovery identified that population declines are likely to occur in the initial years, with recovery expected within 5–15 years (Ref. 434). Given the characteristics of the crude oil, the physical extent and duration of the DWH spill, the event and impacts are considered severe, in comparison with potential condensate spill from the petroleum activity.

Dugongs have smooth skin, which makes them less susceptible to oil adhering to their surface. However, their sparsely distributed sensory hairs, believed to play a role in orientation, could be negatively impacted if coated in oil (Ref. 435). Ingestion of oil, whether directly or indirectly through contaminated seagrass, may lead to toxic effects; however, there is currently no information on potential sublethal effects of oil exposure in sirenians, and reports of oil pollution impacts to dugongs are rare (Ref. 435; Ref. 435). Toxic effects of oil and associated vapors on the eyes and respiratory system in dugongs are expected to be similar to those observed in other marine mammals (Ref. 435).

As identified in Section 5.3.3.1, marine mammals listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Hydrocarbon EMBA. The following BIAs for marine mammals intersect the Hydrocarbon EMBA:

- dugong (breeding, calving, foraging [high density seagrass beds] and nursing)
- humpback whale (migration [north and south] and resting)
- pygmy blue whale (migration and possible foraging area)
- southern right whale (migration and reproduction).

Both stochastic and deterministic analyses were utilised to understand the potential extent and duration of exposure.

Deterministic modelling for the largest swept area of surface oil at ≥10 g/m^2 predicted that surface oil at this concentration may be present for ~90 days following the spill event, with a peak area of coverage of <10 km^2 occurring ~14 day after the spill commenced (Ref. 509). Using the pygmy blue whale migration BIA as an example, the spatial extent of surface oil above the exposure value was predicted to be <0.01% of the entire BIA.

The modelling did not predict surface hydrocarbons concentrations ≥10 g/m^2 in State waters during any season (Ref. 509); consequently, nearshore waters and subsequent impacts from surface exposure to nearshore BIAs (e.g. dugong and southern right whale BIAs) are not expected.

Deterministic modelling for the largest area of entrained oil ≥100 ppb indicated that entrained oil at this concentration may be present for ~90 days following the spill event, with a peak area of coverage of ~250 km^2 occurring ~60 days after the spill commenced (Ref. 509). Using the pygmy blue whale migration BIA as an example, the spatial extent of entrained oil above the exposure value was predicted to be <0.1% of the entire BIA. Based on the stochastic modelling, the maximum residence time of entrained oil exposure ≥100 ppb within this BIA is predicted to be <11 days.

Based on an assessment of the predicted magnitude and duration of an unplanned release of condensate from a LOWC and the spatial distribution of marine mammals within the potentially impacted area, it is expected that only individuals to a small proportion of any marine mammal population is likely to be exposed above the defined exposure value that may result in sublethal or lethal effects. Therefore, the potential impacts for condensate from a LOWC to cause sublethal and lethal effects were ranked as Minor (5) and Moderate (4), respectively.

Marine reptiles

Marine reptiles may be exposed to hydrocarbons from oil spills at the water surface, within the water column, and along shorelines. Turtles are vulnerable at

all life stages, with exposure occurring through direct contact or contamination of their habitats (Ref. 437). Direct exposure, particularly when it blocks the nostrils, may lead to prolonged inhalation of toxic gases, potentially causing respiratory diseases and damage to organs such as the liver and brain (Ref. 438; Ref. 439; Ref. 440).

Oil contact may also result in skin lesions (e.g. inflammation, elevated skin temperature, and chemical burns) (Ref. 439; Ref. 441; Ref. 442; Ref. 443; Ref. 444) and impar movements, leading to exhaustion and increased vulnerability to predators (Ref. 445). Ingested oil can lead to bioaccumulation of PAHs and reduces the assimilation of food (Ref. 440).

Oil spills in shallow coastal foraging areas have been linked to increased marine turtle strandings. Yaghmour (Ref. 439) reported that nearly one-third of strandings along the eastern coast of the United Arab Emirates occurred within 10 days of a spill, with affected turtles showing signs of oil exposure and buoyancy disorders.

Additionally, nesting habitat for Kemp's ridley marine turtles in the Gulf of America declined in 2010 and 2013, coinciding with the DWH oil spill. While this suggests a potential link, it is noted that causality remains uncertain due to other anthropogenic stressors (Ref. 440).

As identified in Section 5.3.3.2, several marine reptiles species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Hydrocarbon EMBA. BIAs for flatback, green, hawksbill and loggerhead turtles may be exposed to hydrocarbon concentrations above relevant, shoreline and entrained exposure value for ecological effects. BIAs for flatback turtles may also be exposed to hydrocarbon concentrations above relevant surface exposure value for ecological effects.

Both stochastic and deterministic analyses were utilised to understand the potential extent and duration of exposure.

Deterministic modelling predicted that shoreline accumulation ≥100 g/m^2 may occur during summer only at Barrow and Montebello islands, with a 1% probability of shoreline loading. The largest volume of oil ashore, 1.9 km, was estimated to occur ~25 days after the spill commenced. The Barrow and Montebello islands are identified as HCTS of flatback, green and hawksbill turtles (Section 5.3.3.2). Therefore, if a LOWC were to occur during the nesting season, while some hatchlings and nesting adults may experience smothering or acute impacts, it is unlikely that the entire local population traversing the intertidal zone would be affected.

Stochastic modelling did not predict exposure within State waters, or any overlap between surface oil and the BIAs for marine turtles. However, for comparative purposes, deterministic modelling for the largest swept area of surface oil at ≥10 g/m^2 predicted that surface oil a this concentration may be present for ~90 days following the spill event, with a peak area of coverage of <10 km^2 occurring ~14day after the spill commenced (Ref. 509). Using the flatback turtle internesting buffer BIA as an example, the spatial extent of surface oil above the exposure value was predicted to be limited to <0.1% of the entire BIA.

Stochastic modelling did not predict dissolved oil above the low (≥10 ppb) exposure value.

Deterministic modelling for the largest area of entrained oil ≥100 ppb indicated that entrained oil at this concentration may be present for ~90 days following the spill event, with a peak area of coverage of ~250 km^2 occurring ~60 days after the

spill commenced (Ref. 509). Using the flatback turtle internesting BIA as an example, the spatial extent of entrained oil above the exposure value was predicted to be <1.3% of the entire BIA. However, stochastic modelling indicates that the probability of exposure to this BIA is moderate at 40–49%. As such, if a vessel spill was to occur during nesting season, it is possible that a small proportion of turtles may be exposed to entrained oil either within nearshore internesting habitats and/or further offshore.

The EPBC threatened short-nosed seasnake and leaf-scaled seasnake, along other EPBC marine listed seasnake species, may be present within the Hydrocarbon EMBA. Oil pollution has been identified as a pressure 'of potential concern' for seasnakes[141] (Ref. 446). These species are susceptible to oil on the sea surface (Ref. 446; Ref. 447; Ref. 448). As air-breathing, obligate bottom feeders, seasnakes may inhale or ingest oil (Ref. 446; Ref. 449). Both the threatened short-nosed seasnake and leaf-scaled seasnake occur primarily on reef flats or in shallow waters of the outer reef edges to depths of 10 m (Ref. 450; Ref. 451).

The EPBC migratory salt-water crocodile may also be present within the Hydrocarbon EMBA. Oil pollution has been identified as a pressure 'of not of concern' for this species (Ref. 446). The salt-water crocodile inhabits Australian coastal waters, estuaries, lakes, inland swamps, and marshes (Ref. 77).

Stochastic modelling did not predict surface oil exposure in State waters or nearshore habitats during any season, and according to the shoreline exposure described above as indicative of oil presence in a nearshore environment, the probability, duration and extent of exposure from a single spill event is predicted to be limited. Consequently, exposure would also be limited.

There are some seasnake species (e.g. yellow-bellied seasnake) which are known to be pelagic and live in the open ocean. Although seasnakes may be present in offshore waters, their abundance is not expected to be high. Potential impacts to seasnakes from direct contact with hydrocarbons are likely to result in similar physical effects to those recorded for marine turtles and may include potential damage to the dermis and irritation to mucus membranes of the eyes, nose and throat (Ref. 436). Seasnakes may also be impacted when they return to the surface to breathe and inhale the toxic vapours associated with the hydrocarbons, resulting in damage to their respiratory system.

Based on an assessment of the predicted magnitude and duration of an unplanned release of condensate from a LOWC, it is expected that only a small proportion of any marine reptile population is likely to be exposed above the defined exposure value that may result in sublethal or lethal effects. Therefore, the potential impacts for condensate from a LOWC to cause sublethal and lethal effects were ranked as Minor (5) and Moderate (4), respective.

Fishes, including sharks and rays

Fishes, including sharks and rays, may be exposed to hydrocarbons from an oil spill within the water column. However, some shark species (including whale sharks) feed in surface waters, so there is also the potential for surface hydrocarbons to be ingested.

[141] The pressure analysis distinguished between oil pollution from shipping ('of less concern') and oil rigs ('of potential concern') (Ref. 446). Although the aspect source for this risk assessment is a spill from a vessel, the higher pressure concern has been adopted.

The impact of oil on fish can vary depending on habitat, behaviour, diet, life stage, and the type of oil involved (Ref. 452). Light oils and petroleum products may cause acute toxicity, although the toxic event is generally over quickly (Ref. 453). Chronic or long-term damage is less likely, as dissolved or entrained hydrocarbons are usually insufficient to harm free-swimming fish and sharks (Ref. 454).

Potential effects on fish include liver damage, irritation of the stomach and intestinal lining, reduced oxygen absorption, decreased reproductive output, and toxic effects on embryos (Ref. 452; Ref. 455). Fish are most vulnerable to oil during embryonic and larval stages (Ref. 456; Ref. 457; Ref. 458). In contrast, juvenile and adult fish are generally more mobile, selective in their feeding, and possess enzymes that help detoxify many oil compounds (Ref. 453), which limits their exposure.

The spill modelling (Ref. 509) showed that in the event of a LOWC, the amalgamated gas and condensate would propel rapidly upward from the seabed and that the oil breaks into smaller droplets. These droplets typically either rise entirely to the surface or remain within the upper water column. Therefore, impacts to demersal fish within the deep offshore waters of the Hydrocarbon EMBA are typically not anticipated. Near the surface, fish can detect and avoid oil slicks, which means fish mortalities are rare during hydrocarbon spills in open waters (Ref. 459; Ref. 460).

As identified in Section 5.3.3.3, several fishes, including sharks and rays species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Hydrocarbon EMBA. The foraging and foraging (high density prey) BIAs for the whale shark may be exposed to hydrocarbon concentrations above the relevant entrained exposure values for ecological effects.

Stochastic and deterministic analyses were utilised to understand the potential extent and duration of exposure.

Deterministic modelling for the largest area of entrained oil ≥100 ppb indicated that entrained oil at this concentration may be present for ~90 days following the spill event, with a peak area of coverage of ~250 km^2 occurring ~60 days after the spill commenced (Ref. 509). Using the whale shark foraging BIA as an example, the extent above exposure value was predicted to be ~0.1% of the entire BIA. Based on the stochastic modelling, the maximum residence time of entrained oil exposure ≥100 ppb within this BIA is predicted to be <3 days.

Based on an assessment of the predicted magnitude and duration of an unplanned release of condensate from a LOWC and the mobile and transitory nature of fishes, including sharks and rays, it is expected that only individuals to a small proportion of fishes, including sharks and rays are likely to be exposed above the defined exposure value that may result in sublethal or lethal effects. Therefore, the potential impacts for condensate from a LOWC to cause sublethal and lethal effects were ranked as Minor (5) and Moderate (4), respectively.

Seabirds and shorebirds

Birds may be exposed to hydrocarbons from an oil spill at the water surface (e.g. foraging, resting, roosting) or on the shoreline (e.g. roosting, nesting). Species that rest or roost on the water's surface (e.g. shearwaters), and those that plunge-dive to feed (e.g. terns, boobies), are particularly vulnerable to surface oil due to their frequent contact with the water surface, small body size, and limited fat reserves (Ref. 461; Ref. 462).

Birds may suffer direct impacts from oil exposure, including suffocation or ingestion of toxic oil, often through preening contaminated feathers (Ref. 463). Ingestion of the aromatic fraction of an oil (e.g. BTEX) may result in metabolic and endocrine disruption, with emerging evidence indicating potential cardiotoxic effects (Ref. 462). Cardiac impairment may also contribute to embryotoxicity, which can occur when eggs are exposed to small amounts of oil (Ref. 462).

Additionally, direct contact with oil can interfere with key physiological and behavioural functions such as thermoregulation, flight, diving, swimming, and buoyancy (Ref. 463; Ref. 464).

As identified in Section 5.3.3.4, several birds species listed as threatened and/or migratory under the EPBC Act have the potential to occur within the Hydrocarbon EMBA. Breeding BIAs for fairy tern, lesser crested tern, roseate tern and wedge-tailed shearwater may be exposed to hydrocarbon concentrations above relevant, shoreline and entrained exposure value for ecological effects. Breeding BIAs for and wedge-tailed shearwater may also be exposed to hydrocarbon concentrations above relevant surface exposure value for ecological effects.

Stochastic and deterministic analysis were utilised to understand the potential extent and duration of exposure.

Deterministic modelling predicted that shoreline hydrocarbons concentrations ≥100 g/m^2 was predicted during summer only at Barrow and Montebello islands, with a 1% probability of shoreline loading. The largest volume of oil ashore, 1.9 km, was estimated to occur ~45 days after the spill commenced. Islands off Barrow Island (Double and Boodie islands) are identified as a rookery and breeding locations for the wedge-tailed shearwater (Section 5.3.3.4.1).

Deterministic modelling for the largest swept area of surface oil at ≥10 g/m^2 predicted that surface oil at this concentration may be present for ~90 days following the spill event, with a peak area of coverage of <10 km^2 occurring ~14 day after the spill commenced (Ref. 509). Using the wedge-tailed shearwater BIA surrounding Barrow and Montebello islands as an example, the spatial extent of surface oil above the exposure value was predicted to be ~0.01% of the entire BIA. As such, if a LOWC occurred during the breeding season, it is unlikely to impact entire local nesting populations.

Based on an assessment of the predicted magnitude and duration of an unplanned release of condensate from a LOWC and the mobile and transitory nature of seabirds and marine shorebirds within the potentially impacted area, it is expected that only individuals to a small proportion of any bird population would be exposed above the defined exposure value that may result in sublethal or lethal effects. Therefore, the potential impacts for condensate from a LOWC to cause sublethal and lethal effects were ranked as Minor (5) and Moderate (4), respectively.

8.16.4.1.6 Risk: Potential changes to the functions, interests and activities of other marine users

Commercial fisheries

As identified in Section 5.4.1, several commercial fisheries with fishing management areas and recent fishing effort recorded were identified within the Hydrocarbon EMBA. A spawning ground for the southern bluefin tuna was also identified within the Hydrocarbon EMBA

Direct impacts to commercially targeted fish species are expected to be similar to those evaluated above for pelagic and demersal fishes. In the event of an unplanned release of MDO, limited exposure to juvenile and adult free-swimming fish are expected (Ref. 453; Ref. 454); this would be the same for commercially important adult or migratory juvenile fish species (e.g. southern bluefin tuna, yellowfin tuna). However, fish stocks may be vulnerable to oil spills close to the spawning grounds or egg and larval drift areas. Fish eggs and larvae are typically vulnerable to toxic oil compounds due to their small size, poorly developed membranes and detoxification systems as well as their position in the water column (Ref. 456; Ref. 457; Ref. 458). Despite potential mortality of eggs and larvae following a spill, subsequent depletion of adult wild fish stocks is rarely recorded (Ref. 454).

Entrained and dissolved deterministic analyses were utilised to understand the potential extent and duration of exposure to known southern bluefin tuna spawning ground.

Stochastic modelling did not predict dissolved oil above the low (≥10 ppb) exposure value. Deterministic modelling for the largest area of entrained oil ≥100 ppb indicated that entrained oil at this concentration may be present for ~90 days following the spill event, with a peak area of coverage of ~250 km^2 occurring ~60 days after the spill commenced (Ref. 509). Based on the spatial extent of the southern bluefin tuna spawning ground (~1,850,475 km^2), the spatial extent of entrained hydrocarbons above the exposure value was predicted to be ~0.01% of the entire spawning ground.

Spill events also have the potential to impact commercial fisheries through indirect impacts. Commercial fishing may be impacted by exclusion zones associated with the unplanned release of condensate, and subsequent reduction in fishing effort. Exclusion zones may impede access to commercial fishing areas for a short time, and nets and lines may become oiled. However, the impacts to commercial fishing from a public perception may be much more significant and longer term than the actual spill.

Fishing areas may be temporarily closed for fishing because of the risks of the catch being tainted by hydrocarbons. Concentrations of oil contaminants in fish, crustacean and mollusc tissues could pose a significant potential for adverse human health effects, and until these products are cleared by health authorities, they could be restricted for sale and human consumption. Toxicity in adult fish has been reported in response to diesel exposure (Ref. 476; Ref. 477). Uptake of oil has been demonstrated in bony fish after exposure to water-accommodated fraction of between 24 and 48 hours. Davis et al (Ref. 478) reported detectable tainting of fish flesh after a 24-hour exposure to marine fuel oil concentrations of 0.33 ppm and diesel concentrations of 0.25 ppm. Most studies, from laboratory trials or of fish collected after release events (including the Hebei Spirit, Macondo, and Sea Empress spills), find evidence of elimination of PAHs in fish, with tissues returning to reference levels within two months of exposure (Ref. 478; Ref. 479; Ref. 480; Ref. 481; Ref. 482; Ref. 483; Ref. 484).

If there are impacts to fish stocks associated with impacts to the larval life phase of fish, there is the potential for reduced profits for commercial fisheries over a longer time, and potential for reduced fishing quotas or exclusion zones which could exclude fishing effort.

The Montara spill of a light gas condensate (the most recent [2009] example of a large hydrocarbon spill in Australian waters) occurred over an area fished by the

Northern Demersal Scalefish Managed Fishery (11 licences held by 7 operators), with goldband snapper, red emperor, saddletail snapper and yellow spotted rockcod being the key species fished (Ref. 485). As a precautionary measure, the then WA Department of Fisheries (now part of DPIRD) advised the commercial fishing fleet to avoid fishing in oil-affected waters. Testing of fish caught in areas of a visible slick (November 2009) found no detectable petroleum hydrocarbons in fish muscle samples, suggesting fish were safe for human consumption. Limited ill effects were only detected in a small number of individual fish (Ref. 485). No consistent effects of exposure on fish health could be detected within two weeks of the end of the well release. Follow-up sampling in areas affected by the spill during 2010 and 2011 (Ref. 485) found negligible ongoing environmental impacts from the spill.

If a condensate spill occurred as the result of a LOWC, a temporary fisheries closure may be put in place by DPIRD or AFMA (or voluntarily by the fishers themselves). Condensate may foul the hulls of fishing vessels and associated equipment, such as gill nets. A temporary fisheries closure, combined with oil tainting of target species (actual or perceived), may lead to financial losses to fisheries and economic losses for individual licence holders. Fishery closures and the flow-on losses from the lack of income derived from these fisheries are likely to have short-term and localised socio-economic consequences, such as reduced employment (in fisheries service industries, such as tackle and bait supplies, fuel, marine mechanical services, accommodation etc.). Therefore, based on limited effects to commercial fishery stocks, and potential minor loss of revenue due to closures (for perceived or actual impact) CAPL assesses change to the functions, interests and activities of fisheries as localised and short term and it is ranked as Minor (5) consequence.

Tourism and recreation

As identified in Section 5.4.5, tourism and recreational activities may occur within the Hydrocarbon EMBA, however except for some offshore recreational fishing, most marine tourism and recreational activities occur in the shallower State waters. Marine nature-based tourist and recreational areas within the Hydrocarbon EMBA include Ningaloo (inclusive of the reef, marine area, and broader World Heritage area) and around the Pilbara Inshore Islands.

The presence of oil within areas used for tourism or recreational activities may reduce the visual amenity of the area, and because these destinations offer primarily nature-based tourism, potential environmental impacts to these places may also reduce visitor numbers. Reduced visitor numbers may also lead to a minor loss of revenue for tourist operators (e.g. charter fishing cancellations due to fishery closures).

Stochastic modelling did not predict visible oil on the water (≥1 g/m^2 exposure value) in State waters during any season (Ref. 509). Therefore, no further evaluation of visual amenity affects to water-based tourism or recreational activities in State waters has been undertaken.

Stochastic modelling predicted a low probability to moderate (23–45%) of shoreline accumulation ≥10 g/m^2 (visible exposure value) along Barrow, Middle and Boodie islands, Montebello Island, several Pilbara inshore islands; and parts of the western and northern coasts of the North West Cape. Shoreline contact was estimated to occur between 13 to ~22 days after the spill commenced, with a maximum oil volume ranging between 2.4–25 m^3 (Ref. 509).

Shoreline loading can adversely impact the visual amenity of coastal areas and potentially restrict beach access for users. However, if shoreline contact occurs (highly unlikely), it is expected that any impacts from this type of event is likely to be of short duration and have a relative small volume ashore. As such, given the volume, type of oil (condensate) and predicted weathering, CAPL assesses the reduction in amenity resulting in change to the functions, interests and activities of tourism and recreation as a Minor (5) consequence.

8.16.4.1.7 Risk: Potential changes to values and sensitivities of protected areas

As identified in Section 5.5, several marine and terrestrial protected areas were identified within the Hydrocarbon EMBA.

Stochastic modelling predicted a low probability to moderate (23–45%) of shoreline accumulation ≥10 g/m^2 (visible exposure value) along Barrow, Middle and Boodie islands, Montebello Island, several Pilbara inshore islands; and parts of the western and northern coasts of the North West Cape. Shoreline contact was estimated to occur between 13 to ~22 days after the spill commenced, with a maximum oil volume ranging between 2.4–25 m^3 (Ref. 509).

Stochastic modelling also predicted a relatively low probability (8%) of entrained oil exposure at ≥100 ppb within the Barrow Island and Montebello Island Marine Parks. No surface oil or dissolved oil was predicted to occur within AMPs or State marine parks.

The spill modelling (Ref. 509) showed that in the event of a LOWC, the amalgamated gas and condensate would propel rapidly upward from the seabed and that the oil breaks into smaller droplets. These droplets typically either rise entirely to the surface or remain within the upper water column. Therefore, impacts to BCH within the deep offshore waters of the Hydrocarbon EMBA are typically not anticipated.

The natural values of these AMPs or State marine parks include species listed as threatened, migratory, marine, or cetacean under the EPBC Act, as well as any identified BIAs for protected marine fauna. Social and economic values of the AMPs include fishing and tourism and recreation.

The consequence evaluations to marine fauna and commercial fisheries are provided above.

Given the expected behaviour and weathering of the condensate, the limited spatial and temporal exposure to marine fauna or commercial fish species above exposure values that may result in sublethal or lethal effects, the potential impacts of a LOWC to the values and sensitivities of Marine Parks have been ranked as Moderate (4).

8.16.4.1.8 Risk: Potential changes to tangible cultural heritage values

As identified in Section 5.6, there are heritage listed places or sites within the Hydrocarbon EMBA, including the World and National heritage listed Ningaloo Coast, Commonwealth listed Ningaloo Marine Area and Learmonth Air Weapons Rage, historic shipwrecks, as well as several protected First Nation sites or artefacts along (or adjacent to) the coast of the North West Cape.

Protected UCH (shipwrecks, Table 5-27) have been identified within the Hydrocarbon EMBA. Given known sea level history, areas in water depths of <125 m would have been emergent land during the extended history of First Nations occupation of Australia; therefore, shallower waters within the

Hydrocarbon EMBA have a higher relative likelihood of encountering UCH than the deeper waters, given the concentration of maritime infrastructure, anchorage activity, navigational hazards, and vessel groundings, as well as increased potential for the survival of remains (Ref. 149). At the time of writing this EP, CAPL understands through consultation with the relevant First Nations people and/or representative bodies that no Aboriginal UCH has been identified within the Hydrocarbon EMBA where seabed disturbance could credibly occur. Given the surface release of the MDO, and that most of the oil is expected to either remain on the surface or within the upper water column, impacts to seabed-based UCH (e.g. shipwrecks or archaeology), including First Nations UCH, are not expected.

Stochastic modelling predicted a low probability to moderate (23–45%) of shoreline accumulation ≥10 g/m^2 (visible exposure value) along Barrow, Middle and Boodie islands, Montebello Island, several Pilbara inshore islands; and parts of the western and northern coasts of the North West Cape. Shoreline contact was estimated to occur between 13 to ~22 days after the spill commenced, with a maximum oil volume ranging between 2.4–25 m^3 (Ref. 509).

Given the expected behaviour and weathering of condensate, limited spatial and temporal exposure, only a small area is predicted to be exposed due to a single spill event. Therefore, changes to tangible cultural heritage values were ranked as Minor (5).

8.16.4.2 Control measures

Table 8-80 and Table 8-81 describe the control measures relevant to this aspect. While Table 8-81 assesses additional control measures, for any element already documented in the OPEP this evaluation is provided for context only. The OPEP remains the overarching control measure implemented for the activity.

Table 8-80: Good practice control measures relevant to unplanned release—LOWC

Control measure	Description
CM-42: Equipment maintenance	Critical equipment will be identified (e.g. BOP) and maintained in accordance with manufacturers' specifications Regular maintenance ensures the integrity of critical equipment is maintained, which ensures optimal performance and reduces the risk of failure
CM-50: WOMP	Under the OPGGS(RMA)R, NOPSEMA require that the petroleum activity have an accepted WOMP in place before commencing the activity. A WOMP ensures systems are in place to manage well integrity and well activities
CM-51: BOP	For this petroleum activity, a BOP will be installed and tested in accordance with the WOMP (Ref. 6; Ref. 7; Ref. 8)
CM-52 WellSafe Standard Operational Procedure (WellSafe SOP)	CAPL's *WellSafe Standard Operational Procedure* (Ref. 510) is an assurance program used to certify that specified requirements have been met; this provides assurance that well control can be maintained at all times. Specifically, WellSaferequires: • rig/rigless certification • well design and plan certification well execution certification
CM-47: OPEP	Under the OPGGS(E)R, NOPSEMA require that the petroleum activity have an accepted OPEP in place before commencing the activity. If a vessel collision occurs, the OPEP will be implemented

Control measure	Description
CM-48a: OSM-BIP	The OSM-BIP describes a program of monitoring oil pollution that will be adopted in the event of a hydrocarbon spill incident (Level 2–3) to marine waters. The OSM-BIP is aligned to the Joint Industry Operational and Scientific Monitoring Framework (Ref. 475) and describes how this Framework applies to Chevron's activities and spill risks in Australian waters. CAPL has developed an OSM-BIP to support all spill monitoring activities across all its assets. The OSM-BIP includes arrangements with OSM services providers with the scientific and technical capability to mobilise operational and scientific monitoring resource according to the timeframes required to help inform response decision-making and remediation activities.
CM-53: SCERP	Source control is part of the first actions taken to minimise the volume of hydrocarbon released and therefore reduce potential impacts and risks to the environment. Key source control options for this LOWC event include capping stack (primary option), drilling a relief well (progressed concurrently with capping stack deployment) covered in the SCERP (Ref. 196). Where applicable to the activities, the SCERP will address: • arrangements for providing Source Control IMT personnel (numbers, competency, capability for the duration of the response) • arrangements for providing equipment and supplies (including OSRL/AMOSC equipment and resources) • arrangements for equipment and personnel monitoring and tracking • activation and mobilisation plans, including activation and expenditure authority and regulatory approval processes • logistics plans and providers • well kill and shut-in plans • pre-campaign Source Control Drill
CM-54: Relief Well Plan	The *Worst Case Discharge Calculation* and *Relief Well Planning SOP* (Ref. 197) provides detailed guidance on the planning and engineering required when planning for relief wells in the event of a LOWC incident. Specific relief well plans are prepared for each well activity, and will include the following aspects in the design of the well: • blowout modelling and dynamic well kill analysis • selection of surface relief well location • wellbore ranging and survey uncertainty requirements • relief well trajectory planning • relief well casing design • equipment availability and contingency services contract arrangements • kill rate limitations
CM-55: Relief Well Equipment List	As detailed in the *Worst Case Discharge Calculation* and *Relief Well Planning SOP* (Ref. 197) CAPL maintains an active Relief Well Equipment List to ensure equipment readiness, completeness and availability prior to well operations. Before commencing drilling, the availability of suitable wellhead equipment and sufficient casing for the relief well will be confirmed through the Chevron inventory management system. This inventory check extends to any items that would normally be considered long-lead items (e.g. liner hanger systems if used in the well design)
CM-56: Relief Well Rig Availability	CAPL tracks and assesses the availability and suitability of available relief well drilling rigs through the OSRL sea/response vessel tracking software. The AEP *Memorandum of Understanding (MoU) Mutual Aid framework* (see Section 10.3.9.7.4 for further description) is also in place to enable access to rigs contracted by other titleholders for relief well drilling

Control measure	Description
CM-49: EMT	An emergency management team (EMT) capable of managing a response to the worst-case discharge scenario described in this EP will be maintained

Table 8-81: Additional control measures evaluated for unplanned release—LOWC

Control measure	Benefit	Cost
Relief well MODU on standby	In the event of a LOWC, having a second MODU on standby for relief well drilling could potentially reduce the release duration by ~15 days, decreasing the estimated relief well timing from ~90 days to ~75 days. While this would reduce the total volume of condensate released into the marine environment, the reduction in consequence is expected to be limited, with no change to the assessed risk consequence. This is because the hydrocarbon is a condensate, the majority is expected to rapidly evaporate/disperse with only ~9.7% is predicted to remain as residual hydrocarbon.	Maintaining a second MODU and personnel/equipment on standby would increase overall activity costs in the order of ~$22.5 million per month (based on a conservative rig rate of $750,000 per day). Furthermore, an additional MODU on standby would introduce additional environmental and safety risks, including increased vessel movements, fuel consumption, atmospheric emissions, underwater sound and operational discharges. Given the relatively limited reduction in release duration, the absence of any reduction in the assessed environmental consequence rating, and the substantial increase in cost and additional environmental impacts and risks, implementing this control measure is considered grossly disproportionate to the limited reduction in consequence (no change in risk consequence rating) that could be expected. As such, the control has not been adopted.
Pre-drill relief well down to surface casing depth	This measure may reduce the time required to complete a relief well by~10 days; reducing the total volume of condensate released to the marine environment in the event of a LOWC. However, the reduction is not expected to materially change the environmental consequence ranking, as the hydrocarbon is a condensate, with residuals comprising ~9.7%, and most of the hydrocarbon is expected to rapidly evaporate/disperse.	This activity would require ~10 additional days from the MODU, two additional rig moves, and a separate plug and abandonment activity, representing a significant increase in campaign cost and operational complexity. An incremental activity cost of ~30%+. It would also result in additional environmental impacts, including drill cuttings and fluid discharges, additional MODU presence and associated vessel activity. In the event of a LOWC, the relief well design and location would be re-evaluated using real-time incident information, including prevailing weather, well condition and source control strategy. Pre-drilling the upper section of a relief well may therefore result in a sub-optimal location or design and could adversely affect the functionality and reliability of the final relief well. Given the limited environmental benefit, additional environmental impacts and risks, significant cost and potential reduction in response

Control measure	Benefit	Cost
		flexibility, this control has not been adopted.
Reduce timing for capping stack deployment and relief well drilling	In the event of a LOWC, reduction in the time to relief a well and/or deploy capping stack may reduce the total volume of condensate released into the marine environment and therefore, reducing the potential environmental impacts and risks.	CAPL evaluated opportunities to further reduce source control response times through the Response Time Modelling (RTM) process. The response timeframes summarised in Section 9.4.3 reflect optimisation of all practicable CAPL-controlled activities, including planning, contracting, logistics, mobilisation and the concurrent execution of critical-path tasks. While further reductions in response times may reduce the total volume of condensate released, the remaining critical-path constraints are primarily associated with activities necessary to safely implement source control operations, including regulatory approval processes and Safety Case approvals. As no additional practicable measures were identified that would materially reduce source control response times beyond those already incorporated into the response strategy, this control has not been adopted.
Reduce timing for SSDI	In the event of a LOWC, SSDI may be required. SSDI deployment may reduce the volume of volatile organic compounds reaching the surface, allowing personnel to safely undertake capping stack intervention. The effectiveness and environmental outcome of SSDI are highly dependent on incident-specific factors, including discharge characteristics, prevailing environmental conditions at the time of the release, source control status, and the location and sensitivity of resources at risk.	CAPL considered opportunities to further reduce SSDI deployment time, including pre-positioning AMOSC response equipment closer to the activity location. However, this equipment forms part of established regional response arrangements and shared response capabilities. Relocating these resources for the duration of the petroleum activity could reduce the availability, maintenance efficiency, and deployment flexibility of these assets to support other response requirements and Titleholders that are members of AMOSC. In addition, SSDI deployment time is largely driven by vessel availability, transit requirements, and mobilisation of response personnel. The response timeframes summarised in Section 9.4.3 reflect optimisation of all practicable CAPL-controlled activities. Many of these activities occur in parallel and represent necessary logistical steps to ensure the SSDI system can be deployed safely and effectively. As no additional practicable measures were identified that would materially reduce SSDI deployment time beyond those already incorporated into the response

Control measure	Benefit	Cost
		strategy, this control measure has not been adopted.
CM-57: Well safe suspension	If wells are temporarily suspended, installation of well barriers and completion of defined activities milestones prior to suspension will maintain well integrity and reduce the likelihood of a LOWC. Temporary well suspension has been identified as part of the petroleum activity (Section 4.2.6), with preventive measures including installation of a retrievable suspension plug to provide a secondary barrier and a wellhead/tree cap to provide mechanical protection to the wellhead (see EPS-59). Where temporary suspension may be required during periods when the MODU or intervention vessel are not present within the OA additional well integrity milestones would further reduce the potential for a LOWC and associated unplanned releases to the environment.	Implementation of well barriers during temporary suspension is already incorporated into the drilling campaign and forms part of the planned well construction sequence. Completion of additional activity milestones prior to extended suspension may increase operational duration and associated costs. However, the environmental benefit of maintaining well integrity and reducing the likelihood of a LOWC event and associated potential environmental risks is considered to outweigh the additional costs associated with implementing this control. Therefore, control measure has been adopted for use.
OPEP—CAR	Refer to Table 8-73.	Refer to Table 8-73.
OPEP—Pre-oiled shoreline response planning	Pre-oiled shoreline assessments can support shoreline clean-up activities by evaluating shoreline conditions before impact, establishing shoreline segments, setting clean-up priorities and identifying suitable response tactics. Additional pre-shoreline response planning may also assist in directing resources to high-value receptors where there is a benefit in reducing receptor exposure (see Section 9.2.2). As identified in Section 8.16.3, no shoreline accumulation ≥1,000 g/m^2 exposure value was predicted. and a very low (1%) probability of shoreline accumulation at ≥100 g/m^2 exposure value was predicted during summer only (i.e. both associated with concentration of shoreline oil that is likely to require clean-up effort) at Barrow and Montebello Islands with a minimum arrival time of ~28.6 days. Shoreline accumulation at ≥10 g/m^2 exposure value (i.e. associated with social, economic, or cultural features) was predicted in summer only, with a 23–45% probability, a minimum arrival time of ~12.77 days. CAPL has also established a PPP and TRGs for priority shoreline	Implementation would require additional personnel time and effort to undertake shoreline assessments and develop planning products beyond the existing PPP and TRG framework. Given the low probability of accumulation associated with concentration of shoreline oil that is likely to require clean-up effort, and the extended predicted shoreline arrival time, the existing PPP and TRG framework provides sufficient opportunity to undertake shoreline response planning if required. Consequently, the current process for tactical pre-oiled shoreline response planning is considered appropriate and additional pre-oiled shoreline response planning has not been adopted.

Control measure	Benefit	Cost
	receptors (Section 9.2.2). The PPP includes pre-prepared Strategic TRGs for locations where shoreline contact is predicted within 4-days and preparing Operational TRGs for receptors where contact is predicted after 4 days or more. The 4-day window has been selected as ample time to understand spill trajectories and operational response requirements and fits within the 14-day OSM-BIP prioritisation window. Consequently, the environmental benefit associated with implementing additional pre-oiled shoreline response planning is considered limited.	
OPEP—Pre-contracted dedicated shallow draft vessel, with trained oil spill responders' personnel, on standby for the duration of the petroleum activity	SPD has been identified as a primary response (see Section 9.3). As such, chartering and equipping vessels on standby for SPD would reduce mobilisation time for the response, potentially increasing the effectiveness of shoreline protection activities where there is a credible risk of shoreline exposure. Early response may also assist in reducing hydrocarbon contact with sensitive shoreline receptors where protection and deflection strategies are considered feasible. As identified in Section 8.16.3, no shoreline accumulation ≥1,000 g/m^2 exposure value was predicted. and a very low (1%) probability of shoreline accumulation at ≥100 g/m^2 exposure value was predicted during summer only (i.e. both associated with concentration of shoreline oil that is likely to require clean-up effort) at Barrow and Montebello Islands with a minimum arrival time of ~28.6 days. Given the very low probability (1%) of shoreline exposure associated with concentration of shoreline oil that is likely to require clean-up effort and the extended predicted arrival time, the environmental benefit associated with the control measure is considered limited.	Implementation of this control would require a dedicated standby vessel for the duration of the petroleum activity, resulting in additional vessel charter costs of ~$75,000 to $200,000 per week (depending on vessel specifications and readiness), increased organisational complexity, and additional environmental impacts and risks associated with vessel presence (e.g. GHG emissions, sound emissions, vessel discharges). The costs of having a small team of trained oil spill responders' available on standby closer to the spill location release would be >$3–4 M / per annum, regardless of whether an oil spill occurred. Given the low probability of shoreline exposure associated with concentration of shoreline oil that is likely to require clean-up effort, the extended predicted shoreline arrival time and the additional environmental impacts associated, the costs associated with implementing this control measure are considered grossly disproportionate to the environmental benefit gained. Consequently, this control has not been adopted for use.
OPEP—Pre-deployment of shoreline protection equipment	Pre-deployment of shoreline protection equipment may reduce mobilisation and deployment times following a spill, potentially increasing the effectiveness of shoreline protection activities where there is a credible risk of shoreline exposure. Early deployment may also assist in reducing hydrocarbon contact with sensitive shoreline	Implementation of additional equipment near the predicted shoreline exposure area would require the mobilisation, deployment, maintenance and periodic replacement of shoreline protection equipment at coastal locations. Ongoing inspection and monitoring activities would also be required to

Control measure	Benefit	Cost
	receptors where protection and deflection strategies are considered feasible. As identified in Section 8.16.3, no shoreline accumulation ≥1,000 g/m^2 exposure value was predicted. and a very low (1%) probability of shoreline accumulation at ≥100 g/m^2 exposure value was predicted during summer only (i.e. both associated with concentration of shoreline oil that is likely to require clean-up effort) at Barrow and Montebello Islands with a minimum arrival time of ~28.6 days. Shoreline accumulation at ≥10 g/m^2 exposure value (i.e. associated with social, economic, or cultural features) was predicted with a 23–45% probability, a minimum arrival time of ~12.77 days. Note that CAPL already has shoreline clean-up equipment at Barrow Island. Given the very low probability (1%) of shoreline exposure to oil concentrations likely to require clean-up efforts, the extended predicted oil arrival time, and the availability of shoreline clean-up equipment at Barrow Island, the environmental benefit associated with pre-deployment of additional shoreline protection equipment is considered limited.	ensure equipment remains suitable for implementation. The activity may introduce additional environmental impacts and risks, including physical disturbance to intertidal and shoreline habitats, and increase health and safety risks associated with personnel access, transport and deployment activities in coastal environments. Given the low probability of shoreline exposure associated with concentration of shoreline oil that is likely to require clean-up effort, the extended predicted shoreline arrival time and the potential environmental and HSE risks associated with deployment activities, the costs associated with implementing this control measure are considered grossly disproportionate to the environmental benefit gained. Consequently, this control has not been adopted for use.
OSM-BIP—Pre-contracted dedicated OSM sampling vessel, with trained OSM personnel, on standby for the duration of the drilling activity	Refer to Table 8-73.	Refer to Table 8-73.
CM-48b: OSM-BIP—Maintain initial water quality / hydrocarbon sampling kits for pre-positioning on Barrow Island and selected vessels, and develop technical procedure for sample collection.	Refer to Table 8-73.	Refer to Table 8-73.
CM-48c: OSM-BIP—Conduct periodical review of existing baseline data sources across	Refer to Table 8-73.	Refer to Table 8-73.

Control measure	Benefit	Cost
receptors within the CAPL OSM Planning Area.		

8.16.4.3 ALARP justification

Drilling offshore activities are a well-practised nationally and internationally activity. The control measures to manage the risk associated with a LOWC are well defined via legislative requirements that are considered standard industry practice. These are well understood and implemented by the petroleum industry and CAPL. Specifically, CAPL has worked in the region for over 10 years and has a demonstrated understanding of industry requirements and their operational implementation in these areas.

During relevant persons consultation, a claim was raised regarding impacts to fisheries from a potential spill event. CAPL responded to this claim (see summary in 'external context' (Section 8.15.5) and within Appendix E.

Oil spill modelling has been used to inform the spatial extent of the Hydrocarbon EMBA and identify areas of potential oil exposure, and this is considered an appropriate basis to inform environmental risk assessments.

Based on the environmental risk evaluation and application of relevant assessment tools as commensurate with the predicted level of risk (e.g. higher-order risks), CAPL considers the adopted good practice and additional control measures (Section 8.16.4.2) are appropriate to manage the potential risks from a loss of containment from a LOWC event. No further reasonably practicable control measures were identified that would provide a meaningful reduction in environmental risk without incurring grossly disproportionate costs. Accordingly, CAPL considers the potential environmental risks associated with this aspect to be reduced to ALARP.

8.16.4.4 Likelihood and risk level summary

The blowout frequencies data from IOGP (Ref. 512) was used to evaluate the likelihood of a LOWC scenario (blowout of an appraisal well), which was determined to be equivalent to 1.5×10^{-4} per drilled well.

Due to the low probability of a LOWC event, and the control measures in place, CAPL has assessed the likelihood and risk level as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Change in water quality			
Water quality	Minor (5)	Remote (5)	Very Low (9)
Change in sediment quality			
Sediment quality	Minor (5)	Remote (5)	Very Low (9)
Potential adverse effects to BCH			
Nearshore benthic habitats	Minor (5)	Remote (5)	Very Low (9)
Potential adverse effects to coastal communities and habitats			
Coastal communities and habitats	Minor (5)	Remote (5)	Very Low (9)
Potential adverse effects to marine fauna			
Marine mammals	Moderate (4)	Remote (5)	Low (8)

Risk / Receptor	Consequence	Likelihood	Residual risk
Marine reptiles	Moderate (4)	Remote (5)	Low (8)
Fishes, including sharks and rays	Moderate (4)	Remote (5)	Low (8)
Seabirds and shorebirds	Moderate (4)	Remote (5)	Low (8)
Potential changes to the functions, interests and activities of other marine users			
Commercial fisheries	Minor (5)	Remote (5)	Very Low (9)
Tourism and recreation	Minor (5)	Remote (5)	Very Low (9)
Potential changes to values and sensitivities of protected areas			
Protected areas	Moderate (4)	Remote (5)	Low (8)
Potential change to tangible cultural heritage values			
Tangible cultural heritage values	Minor (5)	Remote (5)	Very Low (9)

8.16.5 Demonstration of acceptability

Table 8-82 describes the demonstration of acceptability relevant to this aspect.

Table 8-82: Demonstration of acceptability relevant to unplanned release—LOWC

Comparison with acceptable level
Acceptable level AL-23 is applicable to unplanned releases–loss of containment (LOWC) associated with the petroleum activity (refer to Section 6.7). By adopting and implementing preventative control measures (Section 8.16.4.2), the risk of unplanned LOWC is reduced to ALARP. Consequently, this preventative approach ensures the acceptable level AL-23 is met.
Principles of ESD
Precautionary Principle In accordance with Table 6-2, consequence level ranging from Minor (5) to Moderate (4) do not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level of Minor (5) to Moderate (4) do not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required. *Biodiversity Principle* The risks associated with this aspect is expected to affect only individuals to a small proportion of any marine fauna, which is not expected to result in effects at a population level that would prevent their long-term recovery or survival. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity
Relevant environmental legislation and other requirements
Legislation and other requirements considered relevant for this aspect include: • *Navigation Act 2012* (Cth) • *Conservation Management Plan for the Blue Whale 2015–2025* (Ref. 52) • *Conservation Advice Balaenoptera physalus fin whale* (Ref. 282) • *Conservation Advice Balaenoptera borealis sei whale* (Ref. 283) • *Conservation Advice for Sousa sahulensis Australian humpback dolphin* (Ref. 284) • *Conservation Advice for Orcaella heinsohni Australian snubfin dolphin* (Ref. 285) • *National Recovery Plan for the Southern Right Whale (Eubalaena australis)* (Ref. 111) • *Recovery Plan for Marine Turtles in Australia* (Ref. 291) • *Conservation Advice for Leatherback Turtle* (Ref. 408)

- *Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake)* (Ref. 450)
- *Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake)* (Ref. 451)
- *Conservation advice for whale shark* (Ref. 292)
- *Sawfish and River Sharks Multispecies Recovery Plan (*Ref. 409*)*
- *Conservation Advice on Pristis clavate (Dwarf Sawfish)* (Ref. 486)
- *Recovery Plan for the Grey Nurse Shark (Carcharias taurus)* (Ref. 487)
- *Recovery Plan for the White Shark (Carcharodon carcharias) (*Ref. 488)
- *Wildlife Conservation Plan for Seabirds* (Ref. 80)
- *Wildlife Conservation Plan for Migratory Shorebirds* (Ref. 303)
- *National Recovery Plan for albatrosses and petrels* (Ref. 304)
- *Conservation Advice for Limnodromus semipalmatus (Asian dowitcher)* (Ref. 492)
- *Conservation Advice for Sternula nereis nereis (Fairy Tern)* (Ref. 495)
- *National Recovery Plan for (Sternula nereis nereis) (Australian Fairy Tern)* (Ref. 496)
- *National Recovery Plan for the Australian Painted Snipe Rostratula australis (*Ref. 493)
- *Conservation Advice for Tringa nebularia (Common Greenshank)* (Ref. 497)
- Conservation Advice for Calidris ferruginea (Curlew Sandpiper) (Ref. 498)
- *Conservation Advice for Numenius madagascariensis (Far Eastern Curlew)* (Ref. 499)
- *Conservation Advice for Charadrius leschenaultia (Greater Sand Plover)* (Ref. 501)
- *Conservation Advice for Limosa lapponica menzbieri (Yakutian bartailed Godwit)* (Ref. 503)
- *Conservation Advice for Calidris canutus (Red Knot)* (Ref. 504)
- *Conservation Advice for Calidris acuminata (Sharp-tailed Sandpiper)* (Ref. 506)
- North-west Marine Parks Network Management Plan (Ref. 145).

CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:

Requirement	Demonstration
Navigation Act 2012 (Cth) Notice to Mariners	Requirement to issue a Notice to Mariners has been incorporated into the **maritime safety information** control measure
Conservation Management Plan for the Blue Whale 2015–2025 No specific conservation action identified	N/A
Conservation Advice Balaenoptera physalus fin whale No specific conservation action identified	N/A
Conservation Advice Balaenoptera borealis sei whale No specific conservation action identified	N/A
Conservation Advice for Sousa sahulensis Australian humpback dolphin No specific conservation action identified	N/A
Conservation Advice for Orcaella heinsohni Australian snubfin dolphin No specific conservation action identified	N/A
National Recovery Plan for the Southern Right Whale (Eubalaena australis) No specific management action identified	N/A
Recovery Plan for Marine Turtles in Australia Action A4.2: Ensure spill risk strategies and response programs adequately	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2).

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. Note: This is also a specific action identified for the green turtle NWS, loggerhead turtle WA, and flatback turtle Pilbara individual stocks	Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Recovery Plan for Marine Turtles in Australia*
Conservation Advice for Leatherback Turtle No specific conservation action identified	N/A
Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake) Action: Ensure there is no anthropogenic disturbance in areas where the short-nosed sea snake occurs, excluding necessary actions to manage the conservation of the species	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake)*
Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake) Action: Ensure there is no disturbance in areas where the leaf-scaled sea snake occurs, excluding necessary actions to manage the conservation of the species	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake)*
Conservation Advice for whale shark Conservation action: Assess the impacts of offshore installations and associated environmental changes (light spill, chronic noise, changed water temperature, localised nutrient levels) on whale sharks and mitigation options for these impacts	Section 8.16.4 provides a risk assessment and consideration of control measures for unplanned releases from a LOWC. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for whale shark*
Sawfish and River Sharks Multispecies Recovery Plan Action 5c: Identify risks to important sawfish and river shark habitat and measures needed to reduce those risks	Section 8.16.4 provides a risk assessment to marine fauna and habitats predicted to be impacted from an unplanned release from the petroleum activity and consideration of control measures has been identified. Therefore, this activity is not considered to be inconsistent with the *Sawfish and River Sharks Multispecies Recovery Plan*
Conservation Advice on Pristis clavate (Dwarf Sawfish) No specific conservation action identified	N/A
Recovery Plan for the Grey Nurse Shark (Carcharias taurus) No specific management action identified	N/A
Recovery Plan for the White Shark (Carcharodon carcharias) No specific conservation action identified	N/A
Wildlife Conservation Plan for Seabirds Action 2h: Enhance contingency plans to prevent and/or respond to environmental	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5).

emergencies that have an impact on seabirds and their habitats	Therefore, this activity is not considered to be inconsistent with the *Wildlife Conservation Plan for Seabirds*
Wildlife Conservation Plan for Migratory Shorebirds Action 3f: Ensure all areas important to migratory shorebirds in Australia continue to be considered in development assessment processes	Section 8.16.4 provides a risk assessment to marine fauna and habitats predicted to be impacted from an unplanned release from the petroleum activity and consideration of control measures has been identified. Therefore, this activity is not considered to be inconsistent with the *Wildlife Conservation Plan for Migratory Shorebirds*
National Recovery Plan for albatrosses and petrels Action 5c: Risk based response strategies for marine pollution incidents are developed. Action 5b (adapted): Undertake, as feasible, monitoring of breeding colonies for marine pollution impacts, including as a priority: • incidence of oiled birds at nest • effect of marine pollution	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Monitoring, response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *National Recovery Plan for albatrosses and petrels*
Conservation Advice for Limnodromus semipalmatus (Asian dowitcher) No explicit relevant management actions: oil pollution recognised as a threat	N/A
Conservation Advice for Sternula nereis nereis (Fairy Tern) Ensure appropriate oil spill contingency plans are in place for the subspecies' breeding sites that are vulnerable to oil spills	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for Sternula nereis nereis (Fairy Tern)*
National Recovery Plan for (Sternula nereis nereis) (Australian Fairy Tern) No specific management action identified	N/A
National Recovery Plan for the Australian Painted Snipe Rostratula australis No specific management action identified	N/A
Conservation Advice for Tringa nebularia (Common Greenshank) No specific conservation action identified	N/A
Conservation Advice for Calidris ferruginea (Curlew Sandpiper) No specific conservation action identified	N/A
Conservation Advice for Numenius madagascariensis (Far Eastern Curlew) No specific conservation action identified	N/A
Conservation Advice for Charadrius leschenaultia (Greater Sand Plover) No specific conservation action identified	N/A

Conservation Advice for Limosa lapponica menzbieri (Yakutian bartailed Godwit) No specific conservation action identified	N/A
Conservation Advice for Calidris canutus (Red Knot) No specific conservation action identified	N/A
Conservation Advice for Calidris acuminata (Sharp-tailed Sandpiper) No specific conservation action identified	N/A
North-west Marine Parks Network Management Plan The Plan requires that '[a]ctions required to respond to oil pollution incidents, including environmental monitoring and remediation, in connection with mining operations authorised under the OPGGS Act may be conducted in all zones. The Director should be notified in the event of an oil pollution incident that occurs within, or may impact upon, an Australian Marine Park and, so far as reasonably practicable, prior to a response action being taken within a marine park'	The Gascoyne and Montebello Marine Parks are multiple use zone (IUCN VI). The control measures identified for managing an unplanned release provide for the response to, and environmental monitoring and remediation of, an oil pollution incident. Requirements to report oil pollution incidents that occur within, or may impact upon, an AMP is included in Section 10.6.2. Therefore, this activity is not considered to be inconsistent with the *North-west Marine Parks Network Management Plan*
Internal context	
These management processes or procedures were deemed relevant for this aspect: • OPEP (Ref. 2) • OSM-BIP (Ref. 5) • WOMP (Ref. 6; Ref. 7; Ref. 8) • SCERP (Ref. 196) • *Relief Well Planning SOP* (Ref. 197) • *WellSafe Standard Operational Procedure* (Ref. 510) Control measures related to the above management process have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.	
External context	
During relevant persons consultation, a concern was raised regarding impacts to fisheries from a potential spill event. CAPL provided a response that confirmed: • relevant fisheries (including information regarding specific species raised during consultation) are described in Section 5.4.1.1 • impacts to fisheries from a potential spill event are considered within the risk assessment in Section 8.15.4.1.4 and 8.16.4.1.6. No further objections or claims were raised regarding unplanned releases–LOWC arising from the activity.	

8.16.6 Environmental performance

Table 8-83 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-83: Environmental performance relevant to unplanned release—LOWC

EPO	Control measure	EPS	MC
EPO-38: No unplanned release of hydrocarbons to the	**CM-42:** Equipment maintenance	**EPS-42:** Critical equipment will be identified and	**MC-42:** Records confirm critical equipment is

EPO	Control measure	EPS	MC
environment attributable to the petroleum activity.		maintained in accordance with manufacturers specifications.	maintained in accordance with manufacturer specifications.
	CM-50: WOMP	**EPS-50:** Develop and implement a WOMP that satisfies the requirements under Part 5 of the OPGGS(RMA)R, including: • risk controls are in place to mitigate well control events during well construction activities • primary and secondary barriers are in place to mitigate well integrity impacts during well suspension and abandonment activities.	**MC-50.1:** Records confirm that a WOMP has been developed and accepted by NOPSEMA before activities commence.
			MC-50.2: Records confirm that risk controls are implemented in accordance with the WOMP during well construction.
			MC-50.3: Records confirm that primary and secondary barriers are in place in accordance with the WOMP during well suspension and abandonment.
	CM-51: BOP	**EPS-51:** A BOP will be installed, and tested during the drilling activities in accordance with the NOPSEMA-accepted WOMP.	**MC-51:** Records confirm that a BOP was installed, and has been tested during the drilling activities in accordance with the NOPSEMA-accepted WOMP.
	CM-52: WellSafe SOP	**EPS-52.1:** The following certifications shall be in place before activities commence in accordance with CAPL's WellSafe SOP: • well design and plan certification • rig/rigless certification • well execution certification.	**MC-52.1:** Records confirm that MODU certification, well design and plan certification were verified before activities commenced.
		EPS-52.2: The following certifications shall be in place before commencing relief well drilling activities in accordance with CAPL's Wellsafe SOP:	**MC-52.2:** Records confirm that MODU certification, relief well design and plan certifications were verified before the activity commenced.

EPO	Control measure	EPS	MC
		• MODU/rig certification • relief well design and plan certification • well execution certification • Business Unit WellSafe certification	
	CM-57: Well safe suspension	**EPS-57:** Where temporary suspension may be required, the following well integrity milestones would be completed prior to suspension: • completion of the planned drilling phase for the well prior to suspension such as after a casing string has been run and cemented in place • verification that the wells is left in a secure suspended condition consistent with the WOMP.	**MC-57:** Records confirm that well integrity milestones were implemented before temporary suspension of the wells.
	CM-47: OPEP	**EPS-47.1:** In the event of a Level 2 (or above) oil spill occurring response activities are implemented in accordance with the ABU Consolidated OPEP.	**MC-47.1:** Records confirm the OPEP has been activated and response activities implemented.
		EPS-47.2: CAPL will maintain the following minimum preparedness capability for the duration of the petroleum activity: • number and type of response packages as identified in Table 9-3 (LOWC).	**MC-47.2:** Records confirm that CAPL has arrangements in place to access the minimum number and type of responses packages before the petroleum activity commences.
		OPEP	

EPO	Control measure	EPS	MC
		Refer to the Consolidated OPEP for environmental performance outcomes, standards and measurement criteria related to emergency management, emergency preparedness, and each response tactic	
	CM-53: SCERP	**EPS-53.1:** In the event of a LOWC, source control response tactics are implemented in accordance with the SCERP.	**MC-53.1:** Records confirm a SCERP is in place before well activity commenced.
		EPS-53.2: A SCERP shall be in place and up to date before commencing the well activity.	**MC-53.2:** Records confirm the SCERP has been activated and source control activities implemented.
		EPS-53.3: A relief well will be drilled and the well intersected and dynamically killed within 90 days of the LOWC event commencing.	**MC-53.3:** Incident Log (or equivalent records).
		EPS-53.4: Subsea dispersant injection (SSDI) occurs within 20 days following the authorisation from the EMT to implement use of SSDI and commence mobilisation.	**MC-53.4:** Incident Log or equivalent records).
		EPS-53.5: Well capping stack is deployed and well secured within 35 days following the authorisation from the EMT to implement use of a capping stack and to commence mobilisation.	**MC-53.5:** Incident Log (or equivalent records).
		EPS-53.6: CAPL shall maintain service agreements or memberships with third-party well control specialists (as per Section 10.3.9.7.5) that have capabilities to support a response to a LOWC event for the duration of the petroleum activity.	**MC-53.6:** Records confirm that service agreements or memberships are in place before, and for the duration of, the petroleum activity.
	CM-54: Relief Well Plan	**EPS-54:** CAPL will develop an activity-	**MC-54:** Records confirm that an

EPO	Control measure	EPS	MC
		specific Relief Well Plan before commencing the petroleum activity.	activity-specific Relief Well Plan was developed and in place before the petroleum activity commenced.
	CM-55: Relief Well Equipment List	**EPS-55.1:** CAPL will maintain a Relief Well Equipment List for the duration of the petroleum activity.	**MC-55.1:** Records confirm that a Relief Well Equipment List is in place before, and for the duration of, the petroleum activity.
		EPS-55.2: Availability of suitable equipment required for a relief well will be confirmed before commencing the petroleum activity.	**MC-55.2:** Inventory management system confirms availability of relief well equipment.
	CM-56: Relief Well Rig Availability	**EPS-56:** Availability of suitable relief well drilling rigs on or within the vicinity of the NWS will be confirmed before commencing the petroleum activity.	**MC-56:** Vessel tracking (or other equivalent) records confirm presence of relief well drilling rigs before the petroleum activity commenced.
	CM-48a: OSM-BIP	**EPS-48.1:** In the event of a Level 2 (or above) oil spill occurring, the OSM-BIP will be activated and: • operational and scientific monitoring programs are implemented once the specific initiation criteria are met • operational and scientific monitoring programs are implemented within the timeframes outlined in the OSM-BIP • operational and scientific monitoring components are continued until respective termination criteria are met.	**MC-48.1.1:** Records confirm the OSM-BIP has been activated.
			MC-48.1.2: Records confirm that once initiation criteria have been met, operational and scientific monitoring programs were initiated.
			MC-48.1.3: Records confirm that operational and scientific monitoring programs were implemented within the timeframes outlined in the OSM-BIP.
			MC-48.1.4: If any OSM-BIP programs requiring vessels are activated, records demonstrate that CAPL EMT identified vessel availability through existing contracts within 12 hours of OSM-BIP component initiation activation.

EPO	Control measure	EPS	MC
			MC-48.1.5: If any OSM-BIP programs requiring aircraft are activated, records demonstrate that CAPL EMT identified aircraft availability through existing contracts within 12 hours of OSM-BIP component initiation activation.
			MC-48.1.6: Records show CAPL EMT mobilised a minimum of one identified, contracted vessel within 24 hours to Onslow, Dampier or Barrow Island (subject to Barrow Island quarantine requirements).
			MC-48.1.7: Records confirm that once termination criteria have been met, operational and scientific monitoring programs were ceased.
		EPS-48.2: Capability required to implement all operational and scientific monitoring programs are in place to meet the requirements outlined in the OSM-BIP.	**MC-48.2.1:** Records show CAPL obtained monthly capability reports from OSM services provider to demonstrate that the capability outlined in Section 10 of the CAPL OSM-BIP was available throughout the petroleum activity.
	CM-48b: OSM-BIP—Maintain initial water quality / hydrocarbon sampling kits for pre-positioning on Barrow Island and selected vessels, and develop technical procedure for sample collection.		**MC-48.2.2:** Water quality / hydrocarbon sample kits are maintained at Barrow Island and selected vessels, and a technical procedure for sample collection was developed.
	CM-48c: OSM-BIP—Conduct periodical review of existing baseline data sources across receptors within the CAPL OSM Planning Area.	**EPS-48.3:** CAPL maintains available marine baseline data for receptors within their OSM Planning Area as part of a joint-industry marine baseline data assessment project.	**MC-48.3:** Records show that CAPL maintains marine baseline data via the joint-industry marine baseline data assessment project.

EPO	Control measure	EPS	MC
	CM-49: EMT	**EPS-49.1:** CAPL core and support EMT members will complete all hazards and oil spill training in accordance with the *Training and Exercise Program Procedure* (Ref. 198).	**MC-49.1:** Records confirm training is conducted.
		EPS-49.2: CAPL shall maintain an EMT duty roster with a minimum of 10 qualified EMT personnel to fulfil core CAPL EMT positions.	**MC-49.2:** EMT Duty Roster records.
		EPS-49.3: CAPL shall maintain the minimum required trained personnel to fulfil core EMT functions, including source control roles, as per Appendix F of the OPEP.	**MC-49.3:** Records confirm the minimum required personnel are trained.
		EPS-49.4: During any oil spill response, EMT support personnel, including mutual aid personnel, joining the CAPL EMT will be provided with training in accordance with the *Training and Exercise Program Procedure* (Ref. 198) before they join the EMT.	**MC-49.4:** Training/induction records.
		EPS-49.5: CAPL shall maintain service agreements with oil spill response organisations and membership to mutual aid frameworks (as per Section 10.3.9.7) that have capabilities to support a response to an oil spill event.	**MC-49.5:** Records confirm that service agreements and memberships to mutual aid frameworks are in place.
		EPS-49.6: CAPL shall validate that well control specialists seconded into the EMT Source Control Branch during a well control incident hold relevant tertiary qualifications, have relevant industry experience to fill their designated role and	**MC-49.6:** Training/induction records.

EPO	Control measure	EPS	MC
		either must hold a valid IADC or IWCF Subsea Well Control Certification (Supervisor level).	
		EPS-49.7:CAPL shall validate EMT capability and competency arrangements before undertaking a new petroleum activity in Commonwealth waters against the credible WCD scenario and associated EMT response need to ensure sufficient EMT resourcing and competency to fulfil all core and support EMT roles required for the identified WCD scenario.	**MC-49.7:** Review of records.
		EPS-49.8: EMT exercises, including exercises to test source control response arrangements, will be conducted in accordance with Section 10.3.9.8.1 of this EP.	**MC-49.8:** Exercise Records.

8.17 Oil spill response—Dispersant use

8.17.1 Source of aspect

Conducting SSDI involves application of chemical dispersants, which triggers the environmental aspect of planned discharged.

SSDI aims to chemically disperse the released oil and reduce oil droplet size, which removes volatiles and disperses the hydrocarbons within the water column before they reach the surface. Preliminary screening of response options relevant to this EP (Section 9.4.3) determined that applying chemical dispersants subsurface is a potential option for a LOWC, making it safer for responders to access the area for further source control activities such as capping stack deployment.

Monitoring and evaluation of dispersant application effectiveness and ecological impacts continues throughout the response operation. The use of dispersants depends on the particular parameters of an incident resulting in an oil spill and the resources at risk of exposure.

8.17.2 Environmental risk evaluation

The application of chemical dispersants has the potential to change ambient water quality resulting in:

- potential adverse effects to BCH
- potential adverse effects to marine fauna.

8.17.2.1 Consequence evaluation

8.17.2.1.1 Risk: Potential adverse effects to BCH

The application of chemical dispersants (to respond to hydrocarbon release emergency event scenarios) will break up oil into smaller droplets so that they are dispersed, diluted and biodegraded more rapidly in the water column. While dispersants can reduce the scale and extent of hydrocarbons reaching the surface (Ref. 516), and can reduce the likelihood of marine animals and birds becoming oiled at sea (Ref. 517; Ref. 518), they temporarily increase local oil concentrations in the water column (Ref. 519).

In deep-water environments, dispersants are considered to have minimal ecotoxicological effects due to rapid dilution (Ref. 520) with studies have shown no increase in toxicity of dispersed oil following dispersant application (Ref. 518; Ref. 521).

As described in Section 5.3.1.1, the OA is primarily comprised of smooth seabed with bioturbation and scattered patches of bedforms with bare substrate to the north and north-east of the proposed DC. No epibenthic or infauna were identified (Ref. 33), and the OA does not overlap any KEFs. Based on this, potential adverse effects to BCH have been assessed as Minor (5).

8.17.2.1.2 Risk: Potential adverse effects to marine fauna

As previously noted, while dispersants may reduce the scale and extent of hydrocarbons reaching the surface (Ref. 516) and can reduce the likelihood of marine animals and birds becoming oiled at sea (Ref. 517; Ref. 518); they increase local oil concentrations in the water column (Ref. 519).

Studies have shown no increase in toxicity of dispersed oil following dispersant application (Ref. 518; Ref. 521). Therefore, the risk assessment presented in Section 8.16.4.1.2 is considered adequate to address potential adverse effects to marine fauna potentially affected by dispersed condensate, and to avoid duplication, it is not repeated here.

8.17.2.2 Control measures

Table 8-84 describes the good practice control measures relevant to this aspect.

Table 8-84: Good practice control measures relevant to oil spill response—dispersant use

Control measure	Description
CM-47: OPEP	Under the OPGGS(E)R, NOPSEMA require that the petroleum activity have an accepted OPEP in place before commencing the activity. Should a LOWC scenario occurs, the OPEP will be implemented. CAPL has developed an OPEP (Ref. 2) to support level 2 or 3 spill response activities across all its assets.

Control measure	Description
	Dispersants are suitable for either subsea injection or surface spraying. The OPEP includes the use of AMSA Oil Spill Control Agents (OSCA) register. The OSCA register is considered acceptable for maritime use. Listing involves providing evidence that the OSCA is suitable for use in Australia. Once listed on the OSCA Register, the use of these products to assist in oil spill clean-up in Australian waters during a National Plan response is protected by an exemption under the EPBC Act.
CM-48a: OSM-BIP	The OSM-BIP describes a program of monitoring oil pollution that will be adopted in the event of a hydrocarbon spill incident (Level 2–3) to marine waters. The OSM-BIP is aligned to the Joint Industry Operational and Scientific Monitoring Framework (Ref. 475) and describes how this Framework applies to Chevron's activities and spill risks in Australian waters. CAPL has developed an OSM-BIP (Ref. 5) to support all spill monitoring activities across all its assets. Specifically, OM4b: Subsea dispersant injection monitoring provides information on the efficacy of the chemical dispersant applied to the spilt oil.
CM-53: SCERP	Source control is part of the first actions taken to minimise the volume of hydrocarbon released and therefore reduce potential impacts and risks to the environment. CAPL has developed a SCERP (Ref. 196) to support a LOWC.

8.17.2.3 ALARP justification

Chemical dispersant has been applied successfully for several large well control events including surface application during the Montara incident in 2009 and SSDI during the Macondo incident in 2010. As such, these practices are well understood by the petroleum industry and CAPL.

During relevant persons consultation, no objections or claims were raised regarding spill response activities.

Based on the environmental risk evaluation and application of relevant assessment tools as commensurate with the predicted level of risk (e.g. lower-order risks), CAPL considers the adopted good practice control measures (Section 8.17.2.2) are appropriate to manage the potential risks from implementation of subsea dispersant response during an oil spill event. No additional reasonably practicable control measures were identified that would provide a meaningful reduction in environmental risk. Accordingly, CAPL considers the potential environmental risks associated with this aspect to be reduced to ALARP.

8.17.2.4 Likelihood and risk level summary

Use of SSDI would only occur following a LOWC, which as identified in Section 8.16.4.3, has a remote likelihood of occurrence. Any subsequent use of SSDI would then be subject to the controls and application criteria outlined in the SCERP (Ref. 196) and OPEP (Ref. 2) and thus may only be applied to spills distant from coastal receptors under appropriate environmental conditions. Where these criteria are met, and with the selection of a National Plan OSCA-registered dispersant, CAPL has assessed the likelihood and risk level of SSDI as follows:

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential adverse effects to BCH			
BCH	Minor (5)	Rare (6)	Very Low (10)

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential adverse effects to marine fauna			
Marine mammals	Moderate (4)	Rare (6)	Very Low (9)
Marine reptiles	Moderate (4)	Rare (6)	Very Low (9)
Fishes, including sharks and rays	Moderate (4)	Rare (6)	Very Low (9)
Seabirds and shorebirds	Moderate (4)	Rare (6)	Very Low (9)

8.17.3 Demonstration of acceptability

Table 8-85 describes the demonstration of acceptability relevant to this aspect.

Table 8-85: Demonstration of acceptability relevant to oil spill response—dispersant use

Comparison with acceptable level
Use of SSDI would occur following an unplanned release resulting from a LOWC. Accordingly, acceptable level AL-23, which applies to unplanned releases associated with the petroleum activity, is applicable (refer to Section 6.7). Preventative control measures are implemented to reduce the likelihood of a LOWC occurring and, consequently, reduce the likelihood that SSDI would be required. As such, this preventative approach ensures the acceptable level AL-23 is met. In the event that SSDI is required, the adoption and implementation of control measures (Section 8.17.2.2) ensure that risks associated with SSDI are reduced to ALARP.
Principles of ESD
Precautionary Principle In accordance with Table 6-2, consequence level ranging from Minor (5) to Moderate (4) do not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level of Minor (5) to Moderate (4) do not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required. *Biodiversity Principle* The risks associated with this aspect is expected to affect only individuals to a small proportion of any marine fauna, which is not expected to result in effects at a population level that would prevent their long-term recovery or survival. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity
Relevant environmental legislation and other requirements
Legislation and other requirements considered relevant for this aspect include: • *Conservation Management Plan for the Blue Whale 2015–2025* (Ref. 52) • *Conservation Advice Balaenoptera physalus fin whale* (Ref. 282) • *Conservation Advice Balaenoptera borealis sei whale* (Ref. 283) • *Conservation Advice for Sousa sahulensis Australian humpback dolphin* (Ref. 284) • *Conservation Advice for Orcaella heinsohni Australian snubfin dolphin* (Ref. 285) • *National Recovery Plan for the Southern Right Whale (Eubalaena australis)* (Ref. 111) • *Recovery Plan for Marine Turtles in Australia* (Ref. 291) • *Conservation Advice for Leatherback Turtle* (Ref. 408) • *Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake)* (Ref. 450) • *Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake)* (Ref. 451) • *Conservation advice for the whale shark* (Ref. 292) • *Sawfish and River Sharks Multispecies Recovery Plan* (Ref. 409)

- *Conservation Advice on Pristis clavate (Dwarf Sawfish)* (Ref. 486)
- *Recovery Plan for the Grey Nurse Shark (Carcharias taurus)* (Ref. 487)
- *Recovery Plan for the White Shark (Carcharodon carcharias) (*Ref. 488)
- *Wildlife Conservation Plan for Seabirds* (Ref. 80)
- *Wildlife Conservation Plan for Migratory Shorebirds* (Ref. 303)
- *National Recovery Plan for albatrosses and petrels* (Ref. 304)
- *Conservation Advice for Limnodromus semipalmatus (Asian dowitcher)* (Ref. 492)
- *National Recovery Plan for the Australian Painted Snipe Rostratula australis (*Ref. 493*)*
- *Conservation Advice for Sternula nereis nereis (Fairy Tern)* (Ref. 495)
- *National Recovery Plan for (Sternula nereis nereis) (Australian Fairy Tern)* (Ref. 496)
- *Conservation Advice for Tringa nebularia (Common Greenshank)* (Ref. 497)
- Conservation Advice for Calidris ferruginea (Curlew Sandpiper) (Ref. 498)
- *Conservation Advice for Numenius madagascariensis (Far Eastern Curlew)* (Ref. 499)
- *Conservation Advice for Charadrius leschenaultia (Greater Sand Plover)* (Ref. 501)
- *Conservation Advice for Limosa lapponica menzbieri (Yakutian bartailed Godwit)* (Ref. 503)
- *Conservation Advice for Calidris canutus (Red Knot)* (Ref. 504)
- *Conservation Advice for Calidris acuminata (Sharp-tailed Sandpiper)* (Ref. 506)
- North-west Marine Parks Network Management Plan (Ref. 145).

CAPL considers that impact and risk management is consistent with these requirements, as demonstrated below:

Requirement	Demonstration
Conservation Management Plan for the Blue Whale 2015–2025 No specific conservation action identified	N/A
Conservation Advice Balaenoptera physalus fin whale No specific conservation action identified	N/A
Conservation Advice Balaenoptera borealis sei whale No specific conservation action identified	N/A
Conservation Advice for Sousa sahulensis Australian humpback dolphin No specific conservation action identified	N/A
Conservation Advice for Orcaella heinsohni Australian snubfin dolphin No specific conservation action identified	N/A
National Recovery Plan for the Southern Right Whale (Eubalaena australis) No specific management action identified	N/A
Recovery Plan for Marine Turtles in Australia 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. Note: This is also a specific action identified for the green turtle NWS,	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Recovery Plan for Marine Turtles in Australia*

loggerhead turtle WA, and flatback turtle Pilbara individual stocks	
Conservation Advice for Leatherback Turtle No specific conservation action identified	N/A
Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake) Action: Ensure there is no anthropogenic disturbance in areas where the short-nosed sea snake occurs, excluding necessary actions to manage the conservation of the species	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for Aipysurus apraefrontalis (Short-nosed Sea Snake)*
Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake) Action: Ensure there is no disturbance in areas where the leaf-scaled sea snake occurs, excluding necessary actions to manage the conservation of the species	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for Aipysurus foliosquama (Leaf-scaled Sea Snake)*
Conservation Advice for whale shark Conservation action: Assess the impacts of offshore installations and associated environmental changes (light spill, chronic noise, changed water temperature, localised nutrient levels) on whale sharks and mitigation options for these impacts	Section 8.17.2 provides a risk assessment and consideration of control measures for the use of subsea dispersant. Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for whale shark.*
Sawfish and River Sharks Multispecies Recovery Plan Action 5c: Identify risks to important sawfish and river shark habitat and measures needed to reduce those risks	Section 8.17.2 provides a risk assessment to marine fauna and habitats predicted to be impacted from an unplanned release from the petroleum activity and consideration of control measures has been identified. Therefore, this activity is not considered to be inconsistent with the *Sawfish and River Sharks Multispecies Recovery Plan*
Conservation Advice on Pristis clavate (Dwarf Sawfish) No specific conservation action identified	N/A
Recovery Plan for the Grey Nurse Shark (Carcharias taurus) No specific management action identified	N/A
Recovery Plan for the White Shark (Carcharodon carcharias) No specific management action identified	N/A
Wildlife Conservation Plan for Seabirds Action 2h: Enhance contingency plans to prevent and/or respond to environmental emergencies that have an impact on seabirds and their habitats	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Wildlife Conservation Plan for Seabirds*
Wildlife Conservation Plan for Migratory Shorebirds Action 3f: Ensure all areas important to migratory shorebirds in Australia continue	Section 8.17.2 provides a risk assessment to marine fauna and habitats predicted to be impacted from an unplanned release and subsequently application of

to be considered in development assessment processes	SSDI, from the petroleum activity and consideration of control measures has been identified. Therefore, this activity is not considered to be inconsistent with the *Wildlife Conservation Plan for Migratory Shorebirds*
National Recovery Plan for albatrosses and petrels Action 5c: Risk based response strategies for marine pollution incidents are developed. Action 5b (adapted): Undertake, as feasible, monitoring of breeding colonies for marine pollution impacts, including as a priority: • incidence of oiled birds at nest • effect of marine pollution	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Monitoring, response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *National Recovery Plan for albatrosses and petrels*
Conservation Advice for Limnodromus semipalmatus (Asian dowitcher) No explicit relevant management actions: oil pollution recognised as a threat	N/A
Conservation Advice for Sternula nereis nereis (Fairy Tern) Ensure appropriate oil spill contingency plans are in place for the subspecies' breeding sites that are vulnerable to oil spills	Assessment of spill risk strategies is within scope of the OPEP (Ref. 2). Response and recovery of habitats and marine fauna is within the scope of the OSM-BIP (Ref. 5). Therefore, this activity is not considered to be inconsistent with the *Conservation Advice for Sternula nereis nereis (Fairy Tern)*
National Recovery Plan for (Sternula nereis nereis) (Australian Fairy Tern) No specific management action identified	N/A
National Recovery Plan for the Australian Painted Snipe *Rostratula australis* No specific management action identified	N/A
Conservation Advice for Tringa nebularia (Common Greenshank) No specific conservation action identified	N/A
Conservation Advice for Calidris ferruginea (Curlew Sandpiper) No specific conservation action identified	N/A
Conservation Advice for Numenius madagascariensis (Far Eastern Curlew) No specific conservation action identified	N/A
Conservation Advice for Charadrius leschenaultia (Greater Sand Plover) No specific conservation action identified	N/A
Conservation Advice for Limosa lapponica menzbieri (Yakutian bartailed Godwit) No specific conservation action identified	N/A
Conservation Advice for Calidris canutus (Red Knot) No specific conservation action identified	N/A

Conservation Advice for Calidris acuminata (Sharp-tailed Sandpiper) No specific conservation action identified	N/A
North-west Marine Parks Network Management Plan The Plan requires that '[a]ctions required to respond to oil pollution incidents, including environmental monitoring and remediation, in connection with mining operations authorised under the OPGGS Act may be conducted in all zones. The Director should be notified in the event of an oil pollution incident that occurs within, or may impact upon, an Australian Marine Park and, so far as reasonably practicable, prior to a response action being taken within a marine park'	The Gascoyne and Montebello Marine Parks are multiple use zone (IUCN VI). The control measures identified for managing an unplanned release provide for the response to, and environmental monitoring and remediation of, an oil pollution incident. Requirements to report oil pollution incidents that occur within, or may impact upon, an AMP is included in Section 10.6.2. Therefore, this activity is not considered to be inconsistent with the *North-west Marine Parks Network Management Plan*
Internal context	
This management process or procedure was considered relevant for this aspect: • OPEP (Ref. 2) • OSM-BIP (Ref. 5) • SCERP (Ref. 196). Control measures related to the above management process or procedure have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.	
External context	
During relevant persons consultation, no objections or claims were raised regarding spill response activities arising from the petroleum activity.	

8.17.4 Environmental performance

Table 8-86 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-86: Environmental performance relevant to oil spill response—dispersant use

EPO	Control measure	EPS	MC
EPO-38: No unplanned release of hydrocarbons to the environment attributable to the petroleum activity.	**CM-48a:** OSM-BIP	**EPS-48.1:** In the event of a Level 2 (or above) oil spill occurring, the OSM-BIP will be activated and: • operational and scientific monitoring programs are implemented once the specific initiation criteria are met • operational and scientific monitoring programs are implemented within the timeframes	**MC-48.1.1:** Records confirm the OSM-BIP has been activated.

EPO	Control measure	EPS	MC
		outlined in the OSM-BIP • operational and scientific monitoring components are continued until respective termination criteria are met.	
	CM-53: SCERP	**EPS-53.2:** A SCERP shall be in place and up to date before commencing the well activity.	**MC-53.2:** Records confirm the SCERP has been activated and source control activities implemented.
		EPS-53.4: Subsea dispersant injection (SSDI) occurs within 20 days following the authorisation from the EMT to implement use of SSDI and commence mobilisation.	**MC-53.4:** Incident Log or equivalent records).
	CM-47: OPEP	**EPS-47.3:** If SSDI is selected for use, the subsea dispersant shall be approved for use in Australia.	**MC-47.3:** Records confirm the SSDI is included on AMSA's Oil Spill Control Agents list.

8.18 Oil spill response—Shoreline spill response

8.18.1 Source of aspect

Conducting SPD or SHC involves moving personnel and equipment, which triggers the environmental aspect of ground disturbance.

SPD aims to decrease the overall effect of oil on shorelines before they are impacted and uses booms and sorbents placed adjacent to sensitive shoreline habitats to deflect or capture surface oil.

The objective of SHC is to apply techniques that are appropriate to the shoreline type to remove as much oil as possible. Various techniques may be used alone or in combination to clean oiled shorelines, including shoreline assessment, natural recovery, sorbents, sediment reworking, manual and mechanical removal, and washing, flooding, and flushing.

8.18.2 Environmental risk evaluation

Conducting SPD/SHC during a spill response may result in:

- potential adverse effects to coastal communities and habitats

8.18.2.1 Consequence evaluation

8.18.2.1.1 Risk: Potential adverse effects to coastal communities and habitats

Potential impacts of SPD and SHC vary, depending on the method used and the shoreline habitat. General impacts include physical disturbance from using personnel, vehicles, and equipment.

Values and sensitivities in the area that may be affected by the spill include sensitive shoreline habitats (such as mangroves) and nesting/foraging habitat for fauna species such as turtles and birds.

The impacts associated with undertaking SHC may be more than if the hydrocarbon product was left in place and remediated through natural processes. Leaving the product in place is a common response option if continual human and vessel/vehicle traffic has the potential to generate greater impacts than the product itself. This technique has been implemented internationally, including for the Montara spill (where persistent components of the product were left to naturally break down in dense coastal mangroves) and the Macondo spill (where marshes and wetlands that had been impacted by weathered product were allowed to recover naturally). If a smaller extent of shoreline is impacted, the impacts from an SHC response activity may be lessened and more localised.

Potential impacts associated with using vehicles, personnel, and equipment during SHC (and/or SPD) can include disturbing wildlife feeding or breeding (including damage to nests) and damaging dune structures, vegetation, or intertidal habitats. These shoreline activities have the potential to result in short-term and localised damage to or alteration of habitats and ecological communities and therefore the consequence is ranked as Minor (5).

8.18.2.2 Control measures

Table 8-87 describes the good practice control measures relevant to this aspect.

Table 8-87: Good practice control measures relevant to oil spill response—shoreline spill response

Control measure	Description
CM-47: OPEP	Under the OPGGS(E)R, NOPSEMA require that the petroleum activity have an accepted OPEP in place before commencing the activity. CAPL has developed an OPEP (Ref. 2) to support level 2 or 3 spill response activities across all its assets.
CM-48a: OSM-BIP	The OSM-BIP describes a program of monitoring oil pollution that will be adopted in the event of a hydrocarbon spill incident (Level 2–3) to marine waters. The OSM-BIP is aligned to the Joint Industry Operational and Scientific Monitoring Framework (Ref. 475) and describes how this Framework applies to Chevron's activities and spill risks in Australian waters. CAPL has developed an OSM-BIP (Ref. 5) to support all spill monitoring activities across all its assets. Specifically, OM5: Rapid marine fauna assessment and OM6: Shoreline clean-up assessment provides information on the presence of wildlife with regards to predicted trajectory to understand the level of SHC/SPD required

8.18.2.3 ALARP justification

Oil spill response options, including SHC and SPD, are well understood and have been successfully applied during previous oil spill events. The potential risks

associated with the implementation of a shoreline clean-up response during an oil spill event are managed through established control measures prescribed by applicable legislation and/or recognised as standard industry practice. These requirements are well understood and implemented by the petroleum industry, including by CAPL.

It is acknowledged that some uncertainty regarding the specific location at which a SHC and SPD may be deployed, and the types of tactics that may be used, will remain until an event occurs and spill-specific modelling and response planning can occur. However, stochastic oil spill modelling has been used to inform the spatial extent of the Hydrocarbon EMBA and identify areas of potential shoreline oil exposure, and this is considered an appropriate basis to inform response planning and environmental risk assessments. The control measures to manage the potential risks associated with SHC and SPD are linked to NEBA, tactical planning requirements, and monitoring plans.

During relevant persons consultation, no objections or claims were raised regarding spill response activities.

Based on the environmental risk evaluation and application of relevant assessment tools as commensurate with the predicted level of risk (e.g. lower-order risks), CAPL considers the adopted good practice control measures (Section 8.18.2.2) are appropriate to manage the potential risks from implementation of a SHC and SPD response during an oil spill event. No additional reasonably practicable control measures were identified that would provide a meaningful reduction in environmental risk. Accordingly, CAPL considers the potential environmental risks associated with this aspect to be reduced to ALARP.

8.18.2.4 Likelihood and risk level summary

Based on the stochastic results of the vessel collision spill modelling (Section 8.15.3; Ref. 415), no shoreline accumulation above 100 g/m^2 was predicted for any season. Consequently, the use of shoreline spill response techniques would occur following a LOWC, which as identified in Section 8.16.4.3, has a remote likelihood of occurrence.

Further, the stochastic results of the LOWC spill modelling (Section 8.16.3; Ref. 509) indicate a low probability (1%) of shoreline accumulation at or above the 100 g/m^2 exposure value.

Given these details, and with the control measures in place, CAPL has assessed the likelihood and risk level of SSDI as follows.

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential adverse effects to coastal communities and habitats			
Coastal communities and habitats	Minor (5)	Rare (6)	Very Low (10)

8.18.3 Demonstration of acceptability

Table 8-88 describes the demonstration of acceptability relevant to this aspect.

Table 8-88: Demonstration of acceptability relevant to oil spill response—shoreline spill response

Comparison with acceptable level

Shoreline spill response technique would occur following an unplanned release resulting from a LOWC. Accordingly, acceptable level AL-23, which applies to unplanned releases associated with the petroleum activity, is applicable (refer to Section 6.7).

Preventative control measures are implemented to reduce the likelihood of a LOWC occurring and, consequently, reduce the likelihood that shoreline spill response technique would be required. As such, this preventative approach ensures the acceptable level AL-23 is met.

In the event that shoreline spill response technique is required, the adoption and implementation of control measures (Section 8.18.2.2) ensure that risks associated with shoreline spill response techniques are reduced to ALARP.

Principles of ESD

Precautionary Principle

In accordance with Table 6-2, a consequence level of Minor (5) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required.

Intergenerational Principle

In accordance with Table 6-2, a consequence level of Minor (5) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required.

Biodiversity Principle

The risks associated with this aspect include short-term and localised damage to or alteration of habitats and ecological communities which is not expected to represent a threat of serious or irreversible environmental damage. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity

Relevant environmental legislation and other requirements

No legislation or other requirements considered relevant for this aspect were identified.

Internal context

This management process or procedure was considered relevant for this aspect:

- *OPEP* (Ref. 2)
- OSM-BIP (Ref. 5)

Control measures related to the above management process or procedure have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.

External context

During relevant persons consultation, no objections or claims were raised regarding spill response activities arising from the petroleum activity.

8.18.4 Environmental performance

Table 8-89 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-89: Environmental performance relevant to oil spill response—shoreline spill response

EPO	Control measure	EPS	MC
EPO-38: No unplanned release of hydrocarbons to the environment attributable to the petroleum activity.	**CM-47:** OPEP	**EPS-47.1:** In the event of a Level 2 (or above) oil spill occurring response activities are implemented in accordance with the ABU Consolidated OPEP.	**MC-47.1:** Records confirm the OPEP has been activated and response activities implemented.

EPO	Control measure	EPS	MC
		OPEP Refer to the OPEP (Ref. 2) for EPOs, EPSs and MC related to the SHC response tactic.	
	CM-48a: OSM-BIP	**EPS-48.1:** In the event of a Level 2 (or above) oil spill occurring, the OSM-BIP will be activated and: • operational and scientific monitoring programs are implemented once the specific initiation criteria are met • operational and scientific monitoring programs are implemented within the timeframes outlined in the OSM-BIP • operational and scientific monitoring components are continued until respective termination criteria are met.	**MC-48.1.1:** Records confirm the OSM-BIP has been activated.
			MC-48.1.2: Records confirm that once initiation criteria have been met, operational and scientific monitoring programs were initiated.
			MC-48.1.3: Records confirm that operational and scientific monitoring programs were implemented within the timeframes outlined in the OSM-BIP.
			MC-48.1.4: If any OSM-BIP programs requiring vessels are activated, records demonstrate that CAPL EMT identified vessel availability through existing contracts within 12 hours of OSM-BIP component initiation activation.
			MC-48.1.5: If any OSM-BIP programs requiring aircraft are activated, records demonstrate that CAPL EMT identified aircraft availability through existing contracts within 12 hours of OSM-BIP component initiation activation.
			MC-48.1.6: Records show CAPL EMT mobilised a minimum of one identified, contracted vessel within 24 hours to Onslow, Dampier or Barrow Island (subject to Barrow Island quarantine requirements).

EPO	Control measure	EPS	MC
			MC-48.1.7: Records confirm that once termination criteria have been met, operational and scientific monitoring programs were ceased.

8.19 Oil spill response—OWR

8.19.1 Source of aspect

OWR activities are aimed at deterring or treating fauna that have encountered, or are likely to encounter, spilt hydrocarbons. OWR generates the environmental aspect of physical presence/interaction with fauna, through hazing, handling, treating, rehabilitating, and euthanising or releasing fauna.

8.19.2 Environmental risk evaluation

Conducting OWR during a spill response may result in:

- potential adverse effects to oiled and/or unoiled fauna.

8.19.2.1 Consequence evaluation

8.19.2.1.1 Risk: Potential adverse effects to oiled and/or unoiled fauna

Environmental values and sensitivities that may be affected by OWR activities include marine fauna such as turtles, sea snakes and birds.

The intensive nature of OWR activities and the fragile nature of many shore and wading birds, may cause behaviour, distribution and incidental bird mortality. Physical exclusion and hazing operations can result in entanglement and stress-related impacts to marine birds. Cleaning of oiled wildlife may result in skin irritations, impacts to the hydrophobic properties of bird plumage, and stress-induced physiological effects, noting these effects are present in oiled birds too.

Based on the predicted spill trajectory, areas where OWR is most likely to be undertaken would include offshore areas and the shoreline. Spill modelling indicates that shoreline accumulation at or above 100 g/m^2 in areas frequented by fauna is limited to Barrow and Montebello Islands.

If a spill coincided with turtle nesting/hatchling or bird nesting periods, a large number of animals may be treated using OWR. Impacts from hazing and deterrents are anticipated to be localised to the area of potential spill impact and limited to the spill period. Even if OWR was undertaken during nesting periods, only a small proportion of the nesting population would be involved as the species potentially involved nest widely elsewhere. The potential consequences associated with an OWR are localised and short term and are ranked as Minor (5).

8.19.2.2 Control measures

Table 8-90 describes the good practice control measures relevant to this aspect.

Table 8-90: Good practice control measures relevant to oil spill response—OWR

Control measure	Description
CM-47: OPEP	Under the OPGGS(E)R, NOPSEMA require that the petroleum activity have an accepted OPEP in place before commencing the activity. Should a LOWC scenario occurs, the OPEP will be implemented. CAPL has developed an OPEP (Ref. 2) to support level 2 or 3 spill response activities across all its assets. OWR is a support function that is implemented alongside other response options if applicable and commensurate to the scale and nature of the spill. The OPEP identifies the tactics and initiation criteria required to implement OWR.
CM-48a: OSM-BIP	The OSM-BIP describes a program of monitoring oil pollution that will be adopted in the event of a hydrocarbon spill incident (Level 2–3) to marine waters. The OSM-BIP is aligned to the Joint Industry Operational and Scientific Monitoring Framework (Ref. 475) and describes how this Framework applies to Chevron's activities and spill risks in Australian waters. CAPL has developed an OSM-BIP (Ref. 5) to support all spill monitoring activities across all its assets. Specifically, OM5: Rapid marine fauna assessment and OM6: Shoreline clean-up assessment provides information on the presence of wildlife with regards to predicted trajectory to understand the level of OWR required

8.19.2.3 ALARP justification

Oil spill response options, including OWR, are well understood and have been successfully applied during previous oil spill events. The potential risks associated with the implementation of an OWR response during an oil spill event are managed through established control measures prescribed by applicable legislation and/or recognised as standard industry practice. These requirements are well understood and implemented by the petroleum industry, including by CAPL.

It is acknowledged that some uncertainty regarding the specific location at which an OWR may be deployed, and the types of OWR tactics that may be used, will remain until an event occurs and spill-specific modelling and response planning can occur. However, stochastic oil spill modelling has been used to inform the spatial extent of the Hydrocarbon EMBA and identify areas of potential surface and shoreline exposure, and this is considered an appropriate basis to inform response planning and environmental risk assessments. The control measures to manage the potential risks associated with OWR are linked to NEBA, tactical planning requirements, and monitoring plans.

During relevant persons consultation, no objections or claims were raised regarding OWR arising from the petroleum activity.

Based on the environmental risk evaluation and application of relevant assessment tools as commensurate with the predicted level of risk (e.g. lower-order risks), CAPL considers the adopted good practice control measures (Section 8.19.2.2) are appropriate to manage the potential risks from implementation of OWR during an oil spill event. No additional reasonably practicable control measures were identified that would provide a meaningful reduction in environmental risk. Accordingly, CAPL considers the potential environmental risks associated with this aspect to be reduced to ALARP.

8.19.2.4 Likelihood and risk level summary

OWR would occur following a vessel collision or a LOWC event, which as identified in Sections 8.15.4.3 and 8.16.4.3, both have a remote likelihood of

occurrence. Where there is the possibility for oil to impact wildlife, the risks associated with OWR are lower than those associated with inaction. With the control measures in place, the likelihood of the described consequence occurring from OWR activities is determined as Remote (5). Given these details, and with the control measures in place, CAPL has assessed the likelihood and risk level of SSDI as follows.

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential adverse effects to oiled and/or unoiled fauna			
Marine fauna	Minor (5)	Remote (5).	Very Low (9)

8.19.3 Demonstration of acceptability

Table 8-91 describes the demonstration of acceptability relevant to this aspect.

Table 8-91: Demonstration of acceptability relevant to oil spill response—OWR

Comparison with acceptable level
OWR would occur following an unplanned release resulting from a LOWC or vessel collision. Accordingly, acceptable level AL-23, which applies to unplanned releases associated with the petroleum activity, is applicable (refer to Section 6.7). Preventative control measures are implemented to reduce the likelihood of a LOWC and vessel collision occurring and, consequently, reduce the likelihood that OWR would be required. As such, this preventative approach ensures the acceptable level AL-23 is met. In the event that OWR is required, the adoption and implementation of control measures (Section 8.19.2.2) ensure that risks associated with OWR are reduced to ALARP.
Principles of ESD
Precautionary Principle In accordance with Table 6-2, a consequence level of Minor (5) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level of Minor (5) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required. *Biodiversity Principle* The risks associated with this aspect include short-term and localised impacts to individuals to a small proportion of any marine fauna, which is not expected to result in effects at a population level that would prevent their long-term recovery or survival. As such, this aspect is not considered as having the potential to affect biological diversity and ecological integrity
Relevant environmental legislation and other requirements
No legislation or other requirements considered relevant for this aspect were identified.
Internal context
This management process or procedure was considered relevant for this aspect: • *OPEP* (Ref. 2) • OSM-BIP (Ref. 5) Control measures related to the above management process or procedure have been described for this aspect. As such, CAPL considers that impact and risk management is consistent with company policy, culture, and standards.
External context
During relevant persons consultation, no objections or claims were raised regarding spill response activities arising from the petroleum activity.

8.19.4 Environmental performance

Table 8-92 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-92: Environmental performance relevant to oil spill response—OWR

EPO	Control measure	EPS	MC
EPO-38: No unplanned release of hydrocarbons to the environment attributable to the petroleum activity.	**CM-47:** OPEP	**EPS-47.1:** In the event of a Level 2 (or above) oil spill occurring response activities are implemented in accordance with the ABU Consolidated OPEP.	**MC-47.1:** Records confirm the OPEP has been activated and response activities implemented.
		OPEP Refer to the OPEP (Ref. 2) for EPOs, EPSs and MC related to the OWR support function.	
	CM-48a: OSM-BIP	**EPS-48.1:** In the event of a Level 2 (or above) oil spill occurring, the OSM-BIP will be activated and: • operational and scientific monitoring programs are implemented once the specific initiation criteria are met • operational and scientific monitoring programs are implemented within the timeframes outlined in the OSM-BIP • operational and scientific monitoring components are continued until respective termination criteria are met.	**MC-48.1.1:** Records confirm the OSM-BIP has been activated.
			MC-48.1.2: Records confirm that once initiation criteria have been met, operational and scientific monitoring programs were initiated.
			MC-48.1.3: Records confirm that operational and scientific monitoring programs were implemented within the timeframes outlined in the OSM-BIP.
			MC-48.1.4: If any OSM-BIP programs requiring vessels are activated, records demonstrate that CAPL EMT identified vessel availability through existing contracts within 12 hours of OSM-BIP component initiation activation.
			MC-48.1.5: If any OSM-BIP programs requiring aircraft are activated, records demonstrate that CAPL EMT identified aircraft availability through existing contracts within 12 hours of OSM-BIP

EPO	Control measure	EPS	MC
			component initiation activation.
			MC-48.1.6: Records show CAPL EMT mobilised a minimum of one identified, contracted vessel within 24 hours to Onslow, Dampier or Barrow Island (subject to Barrow Island quarantine requirements).
			MC-48.1.7: Records confirm that once termination criteria have been met, operational and scientific monitoring programs were ceased.

8.20 Cultural heritage—Intangible values

8.20.1 Source of aspect

All activities generating environmental aspects as described in Sections 8.1 to 8.19.

8.20.2 Environmental risk evaluation

Activities undertaken during the petroleum have the potential to result in:

- interference with Sea Country values (intangible cultural heritage), including songlines, dreaming stories, and culturally important marine fauna.

8.20.2.1 Consequence evaluation

8.20.2.1.1 Risk: Potential interference with Sea Country values

Intangible cultural heritage refers to the “practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith –that communities, groups and, in some cases, individuals recognise as part of their cultural heritage” (Ref. 522). As identified from literature and/or consultation (Section 5.3.5.2), Sea Country is a value for First Nations people.

Songlines are paths that track across Country and skies, representing Indigenous knowledge that has been collected, protected and transmitted (Ref. 106). Songlines are living tools that embed and mediate history, ecological knowledge, relationships, ancestral beings, and cultural belonging on Country (Ref. 106). Certain songlines may be referred to as ‘Dreaming Pathways’ because of the tracks forged by Creator Spirits during the Dreaming (Ref. 106). Kearney et al. (Ref. 107) describe that for saltwater peoples “stories and songlines locate, interpret and inscribe knowledges of both the Dreaming tracks, bodies and movements of ancestral beings that criss-cross over Sea Country and the

permanent sites of ancestral inhabitation within the marine environment". Fauna are also woven into the Dreaming, songlines and stories (Ref. 108).

Listening and talking with Country through stories, songlines, and other practices are ways First Nations care for, navigate, and connect with Country (Ref. 524). Songlines rely on the continued health of Country, and people's continued access and connection to it (Ref. 106). When Country is damaged or altered, so too are songlines and the knowledge they embody and enact (Ref. 106).

All of the potential impacts and risks assessed in Section 8 have the potential to affect intangible cultural heritage. They have been assessed as lower-order impacts and risks, that are ALARP and acceptable with suitable controls in place. As such, it is anticipated that intangible heritage values such as songlines and connection to Country would not be significantly adversely affected from the petroleum activity; however, as it is acknowledged that intangible cultural heritage values that may be exposed could represent important cultural values. Therefore, CAPL has ranked the consequence for intangible cultural heritage values as Moderate (4).

8.20.2.2 Control measures

Table 8-93 describes the good practice control measures relevant to this aspect.

Table 8-93: Good practice control measures relevant to cultural heritage—intangible values

Control measure	Description
CM-58: Ongoing consultation with First Nations people and/or representative bodies	In addition to consultation undertaken during the preparation of this EP (as required by regulation 25 of the OPGGS(E)R, and described in Section 10.3.4), as part of ongoing consultation (as required by regulation 22(15) of the OPGGS(E)R, and described in Section 10.3.4) CAPL will continue to engage with First Nations people and/or representative bodies. This ongoing consultation relates to both the specific petroleum activity (Table 10-7) as well as broader engagement and relationship building (Section 10.3.4.3). Ongoing consultation and relationship building with First Nations people and/or representative bodies provides a continual improvement opportunity to support CAPLs understanding of cultural values or features that may be present within their areas of operation, and subsequently allow potential impacts and risks to be managed to an ALARP and acceptable level
	If new information on cultural values or features within the OA or Hydrocarbon EMBA is identified during ongoing consultation or relationship building, then any subsequent changes to activities or impacts/risks within the scope of the EP, will undergo an MoC evaluation as per Section 10.3.2.2

8.20.2.3 ALARP justification

MODU and vessel operations are routinely undertaken by the offshore petroleum industry, both nationally and internationally. The potential risk associated with the interference with Sea Country values from these types of activities are managed through established control measures prescribed by applicable legislation and recognised as standard industry practice. These requirements are well understood and implemented by the petroleum industry, including by CAPL.

During relevant persons consultation, no objections or claims were raised regarding interaction with intangible cultural heritage values arising from the petroleum activity.

Based on the environmental risk evaluation and application of relevant assessment tools as commensurate with the predicted level of risk (e.g. 5lower-order risks), CAPL considers the adopted good practice control measures (Section 8.20.2.2) are appropriate to manage the potential risks associated with the interference with Sea Country values. No additional reasonably practicable control measures were identified that would provide a meaningful reduction in environmental risk. Accordingly, CAPL considers the potential environmental risks associated with this aspect to be reduced to ALARP.

8.20.2.4 Likelihood and risk level summary

Impacts and risks associated with the petroleum activity have been assessed as lower-order, that are ALARP with suitable controls in place. As such, it is anticipated that intangible heritage values such as songlines and connection to Country would not be significantly adversely affected from the petroleum activity. Consequently, CAPL has assessed the likelihood and risk level of SSDI as follows.

Risk / Receptor	Consequence	Likelihood	Residual risk
Potential interference with Sea Country values			
Sea Country	Moderate (4)	Unlikely (4).	Low (7)

8.20.3 Demonstration of acceptability

Table 8-94 describes the demonstration of acceptability relevant to this aspect.

Table 8-94: Demonstration of acceptability relevant to cultural heritage—intangible values

Comparison with acceptable level
Acceptable level AL-07 is applicable to Cultural heritage–intangible values associated with the petroleum activity (refer to Section 6.7). Given the localised and sort-term effects to marine fauna from the petroleum activity, no lasting potential impacts to intangible cultural heritage values are predicted. As such, the predicted level of impact will be managed to be equivalent or better than the acceptable levels AL-23.
Principles of ESD
Precautionary Principle In accordance with Table 6-2, a consequence level of Moderate (4) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Precautionary Principle is required. *Intergenerational Principle* In accordance with Table 6-2, a consequence level of Moderate (4) does not represent a threat of serious or irreversible environmental damage and therefore no further evaluation against the Intergenerational Principle is required.
Relevant environmental legislation and other requirements
No legislation or other requirements considered relevant for this aspect were identified.
Internal context
No CAPL environmental performance standards / procedures were deemed relevant to this aspect.
External context
During relevant persons consultation, no objections or claims were raised regarding interaction with intangible cultural heritage values arising from the petroleum activity.

8.20.4 Environmental performance

Table 8-95 lists the EPOs, EPSs and MCs relevant to this aspect.

Table 8-95: Environmental performance relevant to cultural heritage—intangible values

EPO	Control measure	EPS	MC
EPO-09: No interference with First Nations cultural heritage values from planned activities associated with the petroleum activity to a greater extent than is necessary for the reasonable exercise of the rights and performance of duties.	**CM-58:** Ongoing consultation with First Nations people and/or representative bodies	**EPS-58.1:** Ongoing consultation with First Nations people and/or representative bodies is undertaken as per the respective engagement plan and/or consultation protocols.	**MC-58.1:** Relevant persons consultation records.
		EPS-58.2: If new information on First Nations cultural values or features within the OA or Hydrocarbon EMBA is identified during ongoing consultation, any subsequent changes to the potential impacts or risks within the scope of the EP and will undergo an MoC evaluation.	**MC-58.2:** As required, records show that the MoC process was undertaken in response to any new information on cultural values or features within the OA or Hydrocarbon EMBA.

9 Spill response and monitoring

Regulations 22(9) and 22(10) of the OPGGS(E)R requires CAPL to provide for the response and monitoring of oil pollution from emergency events.

CAPL has developed the OPEP (Ref. 2) which details the decision-making framework and response techniques for a hydrocarbon loss of containment event, including the process for determining the appropriate level of hydrocarbon spill preparedness. The OSM-BIP (Ref. 5) details the arrangements and capability in place for operational and scientific monitoring. Operational monitoring collects information about the oil spill to aid planning and decision-making for executing spill response or clean-up operations. Scientific monitoring focuses on the environmental impact attributable to the spill or the associated response activities and informs requirements for remediation (if required).

9.1 Exposure values

NOPSEMA's *information paper on the Application of oil spill modelling in Environment Plans* (Ref. 23) provides recommended exposure values that should be applied for different purposes to meet the requirements of the OPGGS(E)R.

Table 9-1 provides the exposure values adopted in this EP to inform oil spill response option selection and operational and scientific monitoring arrangements. These exposure values are based on the recommended values in Table 1 of NOPSEMA's information paper (Ref. 23).

Table 9-1: Exposure values to inform oil spill response and operational and scientific monitoring arrangements

Oil component	Exposure value	Purpose of exposure value[142]	
		Oil spill response	Operational and scientific monitoring
Shoreline	High (≥1,000 g/m^2)	It represents the concentration of shoreline oil that is likely to require intensive clean-up effort. Natural degradation alone is unlikely to result in a net environmental benefit when compared with active clean-up options (Ref. 525 as cited in Ref. 23)	It represents the concentration of shoreline oil that is of high priority for operational and scientific monitoring
	Moderate (≥100 g/m^2)	It represents the concentration of shoreline oil that is likely to require clean-up effort on man-made structures, sandy or rocky beaches/shorelines, as well as more sensitive coastal habitats (Ref. 525 as cited in Ref. 23)	It represents the concentration of shoreline oil that is of priority for operational and scientific monitoring
	Low (≥10 g/m^2)	Not applicable. At this concentration, available oi spill response options may have limited effectiveness, depending on the environment and hydrocarbon characteristics. Natural degradation may be the response option with the highest net environmental benefit	It represents a lower concentration for defining the planning area for operational and scientific monitoring, within which further analysis can be done to inform monitoring priorities
Surface oil (floating oil)	High (≥50 g/m^2)	At this concentration, containment and recovery (e.g. booms and skimmers), and chemical treatment (e.g. dispersant application) oil spill response options are expected to be most effective	It represents the concentration of surface oil that is of high priority for operational and scientific monitoring. At this concentration, oil transitions from appearing as a metallic sheen to continuous or discontinuous 'true oil' on the surface of the ocean (Ref. 417 as cited in Ref. 23)
	Moderate (≥10 g/m^2)	At this concentration, containment and recovery (e.g. booms and skimmers), and chemical treatment (e.g. dispersant application) oil spill response options may become effective (Ref. 414 as cited in Ref. 23), depending on the environment and hydrocarbon characteristics	It represents the concentration of surface oil that is of priority for operational and scientific monitoring. At this concentration, hydrocarbons may appear as a metallic sheen (Ref. 417 as cited in Ref. 23)
	Low (≥1 g/m^2)	Not applicable. At this concentration, available oil spill response options may have limited effectiveness, depending on the environment and hydrocarbon characteristics. Natural degradation may be the response option with the highest net environmental benefit.	It represents a lower concentration for defining the planning area for operational and scientific monitoring, within which further analysis can be done to inform monitoring priorities. At this concentration, hydrocarbons may appear as a silver to rainbow sheen under calm conditions (Ref. 417 as cited in Ref. 23).

[142] Source: Table 1 from NOPSEMA's information paper on the application of oil spill modelling in EPs (Ref. 23).

Oil component	Exposure value	Purpose of exposure value[142]	
		Oil spill response	Operational and scientific monitoring
Dissolved	High (≥300 ppb PAH)	A relevant consideration in informing the identification of protection priorities and selection of oil spill response options that provide the best net environmental benefit.	It represents the concentration of dissolved oil that is of high priority for operational and scientific monitoring.
	Moderate (≥50 ppb PAH)		It represents the concentration of dissolved oil that is of priority for operational and scientific monitoring.
	Low (≥10 ppb PAH)		It represents a lower concentration for defining the planning area for operational and scientific monitoring, within which further analysis can be done to inform monitoring priorities.
Entrained	High (≥1,00 ppb THC)	A relevant consideration in informing the identification of protection priorities and selection of oil spill response options (e.g. dispersant application) that provide the best net environmental benefit.	It represents the concentration of entrained oil that is of high priority for operational and scientific monitoring
	Moderate (≥100 ppb THC)		It represents the concentration of entrained oil that is of priority for operational and scientific monitoring
	Low (≥10 ppb THC)	Not applicable. Available oil spill response options are limited. Natural degradation may be the response option with the highest net environmental benefit.	It represents a lower concentration for defining the planning area for operational and scientific monitoring, within which further analysis can be done to inform monitoring priorities. It is based on exceedance of water quality guidelines (e.g. the Australian & New Zealand Guidelines; Ref. 96).

9.2 Oil response option selection

9.2.1 Strategic NEBA

CAPL has developed a series of *Strategic Net Environmental Benefit Analysis* (NEBAs) (Ref. 513) using generalised scenarios that reflect the spill risks associated with all CAPL offshore WA operations. Hydrocarbons associated with spill events from all CAPL operations were grouped into oil types as defined by the International Tanker Owners Pollution Federation Ltd (ITOPF) classification system:

- Group 1 – Including Iago, Wheatstone, and Jansz condensate; Wheatstone trunkline fluids; and Wheatstone flowline fluids
- Group 2 – Including MDO, Gorgon condensate, Geryon condensate, Barrow Island crude and Gorgon/Jansz mixed trunkline fluids
- Group 3 / 4 – Including HFO and intermediate fuel oil (IFO) (depending on blend).

These strategic NEBAs were developed as a pre-spill planning tool for all CAPL EPs, to facilitate response option selection and support the development of the overall response strategies by identifying and comparing the potential effectiveness and impacts of oil spill response options (Ref. 513). After considering the benefits and drawbacks of each response option on the ecological, social, and economic receptors within the Hydrocarbon EMBA, the primary response options that were determined to minimise the impacts to the environment and people were pre-selected.

9.2.2 Protection prioritisation process

CAPL has developed a PPP (Ref. 514) to support decision making in the event of a significant spill event. The information within the PPP document is used to identify priorities for protection within the activity specific Hydrocarbon EMBA (see Section 5.1). The identification of priorities for protection assists in the identification of resources to be assessed within the strategic and operational NEBAs, as described above. The NEBA considers the protection priority values, the Hydrocarbon EMBA, and the various control measures, including their feasibility, likely success, environmental benefits, level of effectiveness and performance of response tactics. The output of the NEBA and the protection priorities identified will then guide the strategic direction of the response through informing decisions made around tactical planning and response option selection.

The PPP (Ref. 514) ranks receptors (natural or anthropogenic value or resource that is potentially sensitivity to marine oil pollution) using a 5-level scale (from Very Low [1] to Very High [5]) based on a number of factors, including their sensitivity and vulnerability to oil, their conservation status and the biological and socioeconomic importance of the receptor. The CAPL PPP (Ref. 514) aligns with Department of Transport and Major Infrastructure (DTMI) PPP (Ref. 515) and utilises the same shoreline cells to illustrate broad scale identification of sensitive areas.

Areas with high value receptors and at greatest risk of contact with oil (as indicated by stochastic modelling) are assigned a high protection priority and designated as priority planning areas. The process for identifying these areas described in the PPP document (Ref. 514) considers all High (4) and Very High (5) ranked shoreline cells where contact at or above 100 g/m^2 exposure value

(from stochastic modelling across all seasons) is predicted within 4-days (96 hours). As described in the PPP (Ref. 514), the 4-day contact timeframe is based on the expected time it would take CAPL to develop and implement a TRG for an area predicted to be impacted. For contact outside this timeframe, it expected that CAPL will have reasonable time to develop and implement a TRG prior to oil contacting the resource.

No shoreline accumulation at or above the 100 g/m^2 moderate exposure value was predicted to occur for vessel collision oil spill scenario (see Section 8.15.3). For the LOWC spill scenario shoreline accumulation was predicted around Barrow Island and Montebello Islands (see Section 8.16.3); however, no shoreline accumulation was predicted to occur within a 4-day timeframe. Even at the lower 10 g/m^2 exposure value, no shoreline accumulation was predicted within 4 days for either spill scenario. Therefore, no priority planning areas were identified.

9.3 Activity-specific response option selection

To select the appropriate response options for this EP, hydrocarbons applicable to the worst credible scenarios specific to this activity are:

- Group 2 –MDO and Geryon condensate.

The outcomes of the Strategic NEBA are outlined in Table 6-1 of the OPEP (Ref. 2). Taking into account the outcomes of the Strategic NEBA determined that the recommended response options proposed to be used for the spill scenarios associated with group 2 hydrocarbons include:

- Source Control
- Monitoring, Evaluation, and Surveillance (MES)
- Subsea Dispersant Injection (SSDI)
- SPD
- SHC.

Note: Source Control for a vessel-based spill is the responsibility of the Vessel Master and implementation of the SOPEP. As such, Source Control for a vessel-based spill is not discussed further in this section.

As identified in the OPEP (Ref. 2), offshore containment and recovery (CAR) would not be effective because of the hydrocarbon properties (Group 2); therefore, it has not been included.

For the vessel spill event, there was some shoreline accumulation predicted at the low exposure value (≥10 g/m^2); at this concentration oil spill response options may have limited effect (Table 9-1). No shoreline accumulation at the ≥100 g/m^2 exposure value (i.e. at the exposure value representative of shoreline oil that is likely to require clean-up; Table 9-1) was predicted to occur. As such SHC is likely to be inefficient and resource intensive; however, it has been carried through as a response option for the vessel collision oil spill scenario in the event that it is selected for implementation. For the LOWC spill scenario, shoreline accumulation was predicted around Barrow Island and Montebello Islands (see Section 8.16.3); as such, SPD and SHC have been carried through as a response option.

These response options are carried out alongside Oiled Wildlife and Waste Management response tactics. CAPL does not consider Oiled Wildlife and Waste Management as separate response options as they are implemented as support

tactics for all spill events in a manner that is commensurate to the level of impact and risk of that event.

9.4 CAPL existing spill response capability assessment

Based on the spill response arrangements that CAPL has in place across the business, the capability of these arrangements was determined. This process involved:

- identifying CAPL's existing response arrangements and the equipment and personnel available to CAPL under these arrangements
- defining the response package for each response option, and identifying the critical components for each response package (i.e. equipment or personnel that are limited in number and cannot be purchased or accessed readily)
- determining the number of critical components available to CAPL under existing arrangements
- identify the number of response packages available to CAPL under existing arrangements
- defining the volume of hydrocarbons that could be recovered or treated per response package.

The outcome of this evaluation is included in the OPEP (Ref. 2).

9.4.1 CAPL project-specific capability requirement assessment

To understand the spill response capability required for this petroleum activity, CAPL assessed the worst-case credible spill event and used modelling to understand the number of packages per response technique that may be required to respond to that event. The steps involved in this assessment were:

1. Review the Strategic NEBA (Ref. 513) and priority planning areas to understand the planned response to an event
2. Predict the average surface oil volume per day; and average volume of oil accumulated onshore per shoreline per day (if relevant) to calculate the number of response packages required per response strategy
3. Review the number of response packages available to determine if the capability exists.

9.4.2 CAPL planned response vessel collision

In accordance with the Strategic NEBA (Ref. 513), the response strategies proposed to be used for this spill scenario and response package calculations are described below.

Implement MES response

A MES response will commence for every spill to water as soon as the spill is identified. This may range from very simplistic visual observation only, through to more involved monitoring and evaluating tactics. Appendix C of the OPEP (Ref. 2) has documented the arrangements that CAPL have in place to implement all the required MES tactics; therefore, this technique is not discussed further.

Implement SHC response

Deterministic analysis for the largest volume of shoreline oil accumulation indicated that oil may wash ashore between day 32 to day 37 after the spill

commenced and deposit a peak volume ashore of ~1.6 m^3 (Ref. 415; Table 8-71). The deterministic scenario predicted shoreline exposure to discrete sections of Ningaloo Coast.

Ningaloo Coast is within a high-energy wave environment, has shallow fringing reefs, and vehicle access is limited. From a tactical planning perspective, the relative isolation and environmental sensitivity of Ningaloo Coast may make SHC difficult to implement. However, CAPL would attempt to clean up the oil washed ashore, where practicable and where selected as a response option based on NEBA.

Based on Appendix C of the OPEP (Ref. 2), each SHC team is expected to recover 1.6 m^3 of oil per day. If one clean-up team was mobilised on the 37th day and used for one day, the shoreline oil could be recovered. If required, these efforts could be ramped up as directed and informed by MES activities. Confirmation that CAPL has the arrangements in place to implement the required number of packages is provided in Table 9-2.

Table 9-2: Vessel collision response package deployment timeline

Response technique	Days following spill event							Weeks following spill event					
	1	2	3	4	5	6	7	2	3	4	5	6	7
No. packages – planned MES	1	1	1	1	1	1	1	1	1	1	1	1	1
Does CAPL have the required capability?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
No. packages – planned SHC	0	0	0	0	0	0	0	0	0	0	0	1	0
Does CAPL have the required capability?												Y	

9.4.3 CAPL planned response LOWC

In accordance with the Strategic NEBA (Ref. 513), the response strategies proposed to be used for this spill scenario and response package calculations are described below.

Surface dispersant application is not considered feasible response options due to the nature of the hydrocarbon (Group 2), limited spatial extent of predicted surface oil ≥50 g/m^2 (<5 km^2 area predicted above this exposure value, based on deterministic modelling), and window of opportunity (~1–2 days) for application.

Implement source control response

Source control is the primary response option for drilling-related emergency spill scenarios. In this event, source control tactics may include installation of a capping stack (primary option), drilling a relief well (progressed concurrently with capping stack deployment), and use of SSDI in support of capping stack deployment. The time it takes to implement source control strategies is limited by the critical path components for equipment mobilisation (e.g. the capping stack, or MODU contracting, preparations and mobilisation), as identified in the SCERP (Ref. 196).

Based on the SCERP (Ref. 196), CAPL could have one Source Control – Relief Well package commence arrangements on day one, rig identification, contracting, planning, preparation and mobilisation within 30 days, drill well, intersect, and

dynamically kill well within 90 days (assuming a mobilisation from NWS via AEP MoU). Timing for the assessment and approval of the Safety Case revisions for the relief well rig and support vessels is based on undertaking these tasks concurrently with the relief well rig contracting, suspending operations, preparing and mobilising to site. Confirmation that CAPL has the arrangements in place to implement the required number of packages is provided in Table 9-3. Further details are contained in the SCERP (Ref. 196).

Based on the SCERP (Ref. 196), CAPL could have one Source Control – Well Capping package commence notifications and arrangements on day one, commence mobilisation on day three, and implementation within a further ~35 days (assuming a mobilisation from Singapore). The estimated 35 days to secure the well capping package includes the preparation, assessment, and approval of Safety Case revisions for vessels involved in the well capping. Confirmation that CAPL has the arrangements in place to implement the required number of packages is provided in Table 9-3.

Source Control – SSDI package commence arrangements on day one, contracting, equipment deliveries, vessel preparation from day two, mobilise, and commence implementation within ~20 days (Ref. 196). Confirmation that CAPL has the arrangements in place to implement the required number of packages is provided in Table 9-3.

In the event of a LOWC and if capping stack is required, SSDI may be used to reduce the volume of volatile organic compounds reaching the surface near the release site. This technique makes it safer for personnel to access the area for further source control activities, such as deploying the capping stack during response operations.

An operational NEBA, as described in the OPEP (Ref. 2), will be conducted throughout the response to assess the feasibility and effectiveness of SSDI. The OPEP (Ref. 2) describes the initiation criteria and decision guide for the use of SSDI.

Implement SPD

Deterministic analysis for the largest volume of shoreline oil accumulation indicated that oil may wash ashore from around day 25, with a peak volume ashore of ~17.5 m^3 occurring on day 45 (Ref. 509; Table 8-79). If shoreline contact above ≥100 g/m^2 exposure value occurs (1% probability), it would only contact the Barrow and Montebello islands. The volume of oil ashore was used to support the planned response requirements—the volume of hydrocarbons that would need to be treated by an SPD response is directly correlated to the volume of oil that may wash ashore.

According to Appendix C of the OPEP (Ref. 2), each protection team is expected to recover 15.6 m^3 of hydrocarbon per day. Based on the assumption that a peak volume of 17.5 m^3 washes ashore on the 45th day, CAPL would need up to two SPD package available before day 45 to implement the SPD response. Confirmation that CAPL has the arrangements in place to implement the required number of packages is provided in Table 9-3.

Implement SHC response

Deterministic modelling for the largest volume of shoreline oil accumulation indicated that oil greater than ≥100 g/m^2 oil may wash ashore between ~29 to 47 days after the spill commenced (Ref. 509; Table 8-79) and deposit a peak volume ashore of 17.5 m^3 occurring on day 45 (Ref. 509*;* Table 8-79).

Based on Appendix C of the OPEP (Ref. 2), each SHC team is expected to recover 1.6 m^3 of oil per day. If two clean-up teams were mobilised on day 45 and used each day, the shoreline oil could be recovered within ~6 days. If required, these efforts could be ramped up as directed and informed by MES activities. Confirmation that CAPL has the arrangements in place to implement the required number of packages is provided in Table 9-3.

Implement MES response

A MES response will commence for every spill to water as soon as the spill is identified. This may range from very simplistic visual observation only, through to more involved monitoring and evaluating tactics. Appendix C of the OPEP (Ref. 2) has documented the arrangements that CAPL have in place to implement all the required MES tactics; therefore, this technique is not discussed further.

Table 9-3: LOWC response package deployment timeline

Response technique	Days following the event							Weeks following the event										
	1	2	3	4	5	6	7	2	3	4	5	6	7	8	9	10	11	12	13
No. packages–planned source control–relief well	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Planning and mobilisation										*Implementation*								
Does CAPL have the required capability?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
No. packages–planned source control–well capping	1	1	1	1	1	1	1	1	1	1	1								
	Planning and mobilisation									*Implementation*									
Does CAPL have the required capability?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y								
No. packages–planned SSDI	1	1	1	1	1	1	1	1	1										
Does CAPL have the required capability?	Y	Y	Y	Y	Y	Y	Y	Y	Y										
No. packages–planned SPD												2							
Does CAPL have the required capability?												Y							
No. packages–planned SHC													2						
Does CAPL have the required capability?													Y						
No. packages–planned MES	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Does CAPL have the required capability?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

9.5 Capability assessment against the OSM-BIP

Regulation 22(9) and 22(10) of the OPGGS(E)R requires CAPL to provide for monitoring of impacts to the environment from oil pollution and response activities that is appropriate to the nature and scale of the risk of environmental impacts of the activity; and is sufficient to inform any remediation activities.

For all CAPL activities, the Combined OSM Planning Area presented in CAPL's OSM-BIP (Ref. 5), represents the predicted spatial extent of hydrocarbon exposure at the low thresholds for surface, in-water and shoreline components that may occur as a result of CAPL's activities in the NWS.

For this petroleum activity, an activity specific OSM Exposure Area (Appendix G) has been developed to predict the spatial extent of hydrocarbon exposure at the low exposure values for surface, in-water and shoreline components.

The exposure values used to determine the Combined OSM Planning Area and activity specific OSM Exposure Area are based on the recommended values in Table 1 of NOPSEMA's information paper (Ref. 23) and shown in Table 9-1.

The Activity specific OSM Exposure Area for this petroleum activity fits within the Combined OSM Planning Area described in CAPL's OSM-BIP (Ref. 5), and is described further in Appendix G.

10 Implementation strategy

This section provides a description of the implementation strategy as required under regulation 22 of the OPGGS(E)R. The implementation strategy identifies the systems, practices, and procedures used to ensure the environmental impacts and risks of the petroleum activities are continuously reduced to ALARP and the EPOs and EPSs detailed in Section 8 are achieved.

CAPL, as operator, is responsible for ensuring the petroleum activity within scope of this EP is managed in accordance with this implementation strategy. The MODU and vessel contractors will be required to comply with the requirements of this EP to ensure that the EPOs and EPSs are achieved. The MODU and vessel contractors HSE documentation will be reviewed for alignment with the relevant requirements described in this EP prior to the commencement of the activity.

10.1 Operational Excellence Management System

CAPL's operations are managed in accordance with Chevron Corporation's OEMS, which is a comprehensive management framework that supports the corporate commitment to protect the safety and health of people and the environment. The OEMS aligns with ISO 14001:2015 Environmental management system – Requirements with guidance for use (Ref. 178) and meets the requirements of the OPGGS(E)R.

OE systematically manages workforce safety and health, process safety, reliability, and integrity, environment, efficiency, security, and stakeholder engagement to meet the OE objectives and ensure safe operations of CAPL facilities and projects. The OEMS comprises the following key components (Figure 10-1):

- **leadership and OE culture** — through the OEMS, CAPL leaders engage employees and contractors to build and sustain the OE culture and deliver OE performance
- **management system cycle** (MSC) — by applying the MSC, CAPL leaders make risk-based and data-driven decisions, prioritise activities, and direct improvements
- **focus areas and OE expectations** (including common expectations) — focus areas are categories of OE risks and include workforce safety and health, process safety reliability and integrity, environment, efficiency, security, and stakeholder engagement; OE expectations guide the design, management, and assurance of the presence and effectiveness of safeguards.

The OEMS outlines the process for identifying, establishing, and maintaining safeguards and to provide assurance that they are in place, functioning as intended, and are in accordance with legal and OE requirements. The risk management process (Figure 10-1) assesses and identifies safeguards, which are the hardware and human actions designed to directly prevent or mitigate an incident or impact associated with the project, personnel, and the environment. The assurance process (Figure 10-1) provides the verification and validation that the safeguards are in place and functioning as intended.

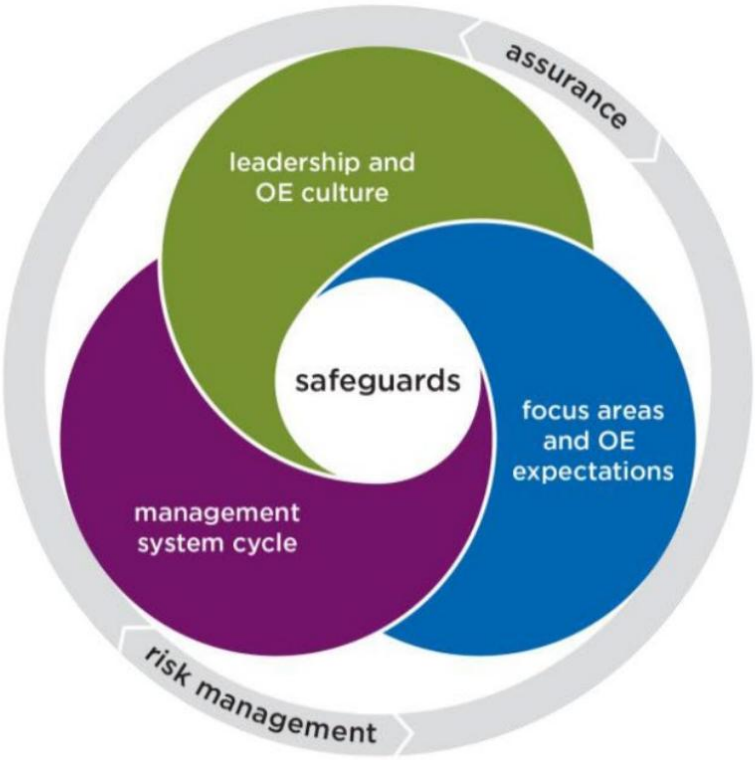


Figure 10-1: Overview of Chevron Corporation's OEMS

10.2 Leadership and OE culture

CAPL leaders demonstrate and are accountable for the consistent and rigorous application of the OEMS to drive performance and manage risks. The actions and visibility of leaders reinforce CAPL's commitment to place the highest priority on the safety and health of its workforce, and on the protection of communities, the environment, and its assets.

10.2.1 Roles and accountability

CAPL leaders have the overall accountability for the implementation of the OEMS.

10.2.1.1 Chain of command (petroleum activity)

As required under regulation 22(3) of the OPGGS(E)R, a clear chain of command for implementing the petroleum activity is outlined in Figure 10-2.

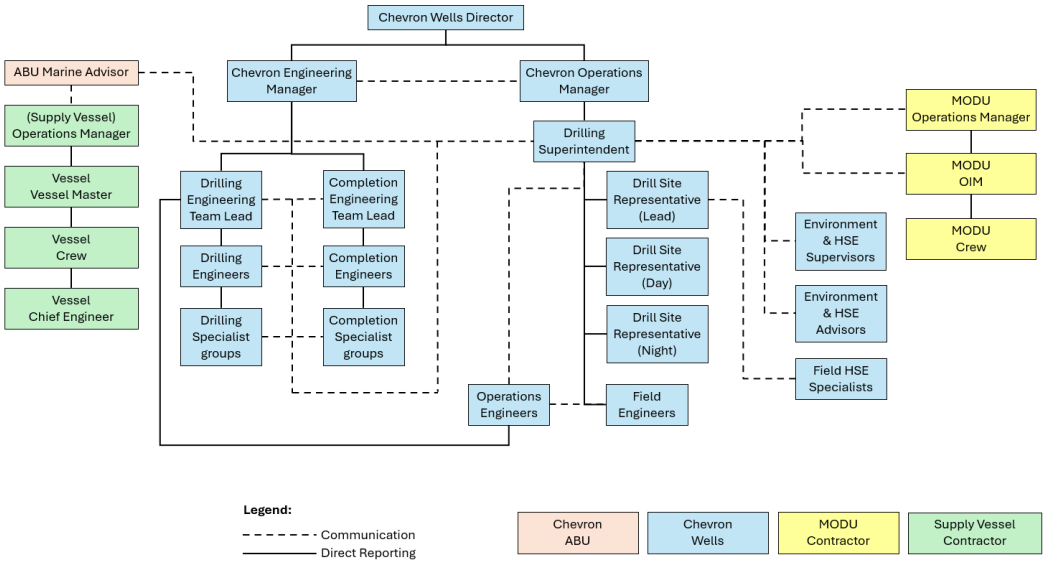


Figure 10-2: Chain of command — G&E drilling activity

10.2.1.2 Roles and responsibilities (petroleum activity)

The roles and responsibilities of key CAPL and contractor personnel for implementing task-specific control measures as detailed in Section 8, are summarised in Table 10-1.

Table 10-1: Key roles and responsibilities—G&E drilling

Role	Responsibilities
CAPL personnel	
Chevron Operations Manager	• Overall responsibility for implementing, managing, and adhering to this EP. Ensure that: • ongoing consultation is conducted in accordance with Section 10.3.4.1 • any Management of Change (MoC) is conducted in accordance with Section 10.3.2.2 • routine environmental reporting is undertaken in accordance with Section 10.6.3.
Drilling Superintendent	Ensure that: • all personnel are made aware of their requirements under this EP and have completed inductions • all third-party vessels or contractors are aware of any requirements in this EP, including completion of relevant inductions as per Section 10.2.1.3 • impacts and risks are continually reduced to ALARP and an acceptable level by implementing this EP in accordance with Section 8 • environmental incident reporting is completed in accordance with Section 10.6.2 • pre-mobilisation inspections of vessels are undertaken to confirm they comply with relevant legislative requirements, and requirements under this EP • corrective actions identified during environmental inspections are closed out in accordance with Section 10.3.6 • all incidents, including breaches of environmental performance standards, are reported to the Chevron Director / Ops Manager.

Role	Responsibilities
Drill Site Representative (Offshore)	Ensure that: • all personnel are made aware of their requirements under this EP • impacts and risks are continually reduced to ALARP and an acceptable level by implementing this EP in accordance with Section 8 • compliance with this EP is verified in accordance with Section 10.3 and Section 10.4, including: – completion of environmental inspections – collection of evidence against environmental performance standards – assist with review, investigation, and reporting of environmental incidents (as required).
Environment and HSE Supervisors	Ensure that: • all personnel are made aware of their requirements under this EP • impacts and risks are continually reduced to ALARP and an acceptable level by implementing this EP in accordance with Section 8 • pre-start visual observations are conducted and opportunistic sightings data are maintained in accordance with Section 7.6.1.3 • all changes to this EP are subject to a MoC assessment as described in Section 10.3.2.2 • compliance with this EP is verified in accordance with Section 10.3 and Section 10.4, including: – completion of environmental inspections – collection of evidence against environmental performance standards – regularly reviewing compliance with environmental performance standards – preparing environmental performance report following completion of drilling program. • assist with review, investigation, and reporting of environmental incidents (as required) • this EP is reviewed in accordance with Section 10.7.
Contractor	
Vessel Master/s	Ensure that: • impacts and risks are continually reduced to ALARP and an acceptable level by implementing this EP in accordance with Section 8 • all necessary vessel-related documentation (e.g. SOPEPs, certificates, etc.) is available in accordance with Section 8 • all marine safety information notifications are issued in accordance with Section 8 • vessel operations are being conducted in accordance with the legislative requirements and this EP, including: – waste management, refuelling, and emergency/oil spill response – cetacean interaction requirements in accordance with EPBC Regulations 2025 – any other additional marine fauna interaction requirements in accordance with this EP. • maintenance of equipment and records meet statutory requirements • all incidents are immediately reported to the Drill Site Representative • all emissions and discharges are monitored and recorded in accordance with Section 8 and Section 10.6.1 • any potential UCH finds are reported to the Drill Site Representative • a Vessel Master (or delegate) is on duty at all times.

Role	Responsibilities
MODU Offshore Installation Manager (OIM)	Ensure that: • impacts and risks are continually reduced to ALARP and an acceptable level by implementing this EP in accordance with Section 8 • all marine safety information notifications are issued in accordance with Section 8 • MODU operations are being conducted in accordance with the legislative requirements and this EP, including waste management, refuelling, and emergency/oil spill response • maintenance of equipment and records meet statutory requirements • all incidents are immediately reported to the Drill Site Representative • all emissions and discharges are monitored and recorded in accordance with Section 8 and Section 10.6.1.
MODU and vessel crew	Ensure that: • working in accordance with accepted MODU and vessel procedures • compliance with this EP's requirements as applicable to assigned role • all incidents or spills are immediately reported to the MODU OIM or Vessel Master.
Aviation operators	Ensure that: • aircraft implement cetacean interaction requirements in accordance with EPBC Regulations 2025.
ROV/AUV operator	Ensure that: • UCH finds protocol is implemented.

10.2.1.3 Training and competency (petroleum activity)

In accordance with regulation 22(4) of the OPGGS(E)R, each employee or contractor responsible for implementing task-specific control measures during operational activities must be aware of their specific responsibilities as detailed in this EP.

People who hold responsibilities relating to implementing this EP are hired by CAPL on the basis of their particular qualifications, experience, and competency. CAPL's training and competency system is used to identify corporate and role-specific training and competency requirements for CAPL personnel. The system is also used to ensure training and competency requirements are maintained and are up-to-date. This includes applicable IADC or IWCF certifications, where required.

All external contractor personnel involved with activities within scope of this EP will hold qualifications or training certification relevant to their role, which will be confirmed through the contractor selection process, audits and review processes.

The MODU and vessel contractors will provide marine crew who are trained and competent to undertake their respective activities on board the MODU or vessel. All marine personnel will be qualified in accordance with the International Convention on Standards of Training Certification and Watch Keeping for Seafarers (STCW95).

CAPL's personnel with specific responsibilities under this EP (refer to Section 10.2.1.2) were included during the internal review of this EP and other personnel (e.g. contractor personnel) with role-specific responsibilities under this EP are made aware of these.

All personnel (including contractors) must attend inductions that are relevant to their role (Table 10-2). Records of attendance at inductions will be maintained as per Section 10.3.2.1.

Table 10-2: Training and competency—G&E drilling

Required personnel	Scope
Induction	
All relevant personnel	Before commencing activities, all relevant personnel, including contractors, must attend an induction that includes an overview of the requirements of this EP. This induction fosters environmental stewardship amongst all personnel and ensures that they are aware of the control measures implemented to minimise the potential impact on the environment. The induction includes: • awareness of Chevron Corporation's Operational Excellence Policy 530 (Appendix A) • an overview of environmental sensitivities, and key impacts and risks from the petroleum activity • cetacean interaction requirements under Part 8 of this EPBC Regulations 2025 and additional marine fauna interaction controls as per requirements of this EP • offshore seabird management procedure • overview of requirements of UCH finds protocol • waste management and hazardous materials housekeeping requirements • incident reporting requirements (including definitions and reporting pathways) • incident response arrangements.
Marine fauna observers	
Bridge-watch crew HSE Representative	All bridge-watch crew and HSE Representatives must complete a training session on marine fauna observations before commencing activities. This training session, facilitated by a CAPL or contractor HSE Specialist that has previously completed an MFO training course, covers: • cetacean observation requirements under the EPBC Regulations 2025 • identification of cetaceans and megafauna that may be present within the area • an overview of activities and the marine megafauna that may be present during these activities • an overview of the potential impacts and risks to marine megafauna • an overview of EP controls and management procedures relevant to marine megafauna presence • the observation and reporting requirements When trained crew are undertaking observations, expectations are that: • observation equipment / tools are used as required (e.g. binoculars, marine megafauna ID prompts etc) • escalation process carried out if marine megafauna are identified including alerting bridge crew so that appropriate response can be initiated as required • make and maintain records including the date, time and approximate distance from the vessel, and the action taken. Trained personnel are expected to: • conduct observations in accordance with the requirements of this EP • follow the reporting process when cetaceans or megafauna are identified • maintain records accurately and complete sighting forms as required.

Required personnel	Scope
	Completion of the awareness session/induction is a minimum requirement for those performing observations relevant to this EP and it is valid for a 12-month period.

10.3 Focus area and OE expectations

The OE expectations are organised into six focus areas (Figure 10-3). The OE expectations provide guidance to design, operate, maintain, improve, and assure the presence and effectiveness of safeguards. Common expectations also apply and support the OE expectations and focus areas (Figure 10-3).



Figure 10-3: Focus areas and common expectations

The focus areas and common expectations relevant to this EP, and their key processes that demonstrate how CAPL is effective in reducing environmental impacts and risks to ALARP and an acceptable level, are listed in Table 10-3. Each of these focus areas and common expectations are described in further detail in the following subsections.

Table 10-3: Relevant focus areas and common expectations

Focus area or common expectation	Key processes
Focus area	
Workplace safety and health	• *Australian Operations Process: Control of Work Process* (Ref. 179) • *Chevron Shipping's Marine Standard Non Tankers: Corporate OE Standard* (Ref. 180) • *Australian Hazardous Materials Management Procedure: Australian Standardised OE Procedure* (Ref. 181).
Process safety, reliability and integrity	• *OE Information Management: Australian Standardised OE Process* (Ref. 182) • *Management of Change for Facilities and Operations: Australian Standardised OE Process* (Ref. 183).
Environment	• *Environment Risk Management Process* (Ref. 184) • *Quarantine Procedure Marine Vessels. Australian Standardised OE Process* (Ref. 185).
Stakeholders	• *Stakeholder Engagement and Issues Management: Australian Standardised OE Process* (Ref. 186).

Focus area or common expectation	Key processes
Common expectation	
Risk management	• *Australian OE Risk Management Process* (Ref. 156) • *Risk Management RiskMan Procedure* (Ref. 157).
Assurance	• *OE compliance and assurance standard* (Ref. 187) • *OE Corporate Standard Incident Investigation* (Ref. 188) • *OE Data Reporting Standard* (Ref. 189).
Contractor OE management	• *Contractor Operational Excellence Management: Australian OE Process* (Ref. 190).
Incident investigation and reporting	• *Incident Investigation and Reporting (II&R) Execution Manual* (Ref. 191).
Emergency management	• *OPEP* (Ref. 2) • *OSM-BIP* (Ref. 5) • *Emergency Management OE Process* (Ref. 192).

10.3.1 Workforce safety and health

10.3.1.1 Control of work

The CoW expectation is to assess workplace safety and health hazards and manage the risks associated with the execution and control of work performed by CAPL employees and their business partners. The CoW process (Ref. 179) ensures activities are assessed and executed in a safe and consistent manner.

Standards and procedures relating to CoW relevant to this Plan include the Work Authorisation (formerly permit to work [PTW] system). The Work Authorisation system, which includes SIMOPS and hazard analysis, is a way to identify, communicate, mitigate, and control hazards associated with work that have the potential to adversely affect HSE. As the potential consequence associated with each task increases, so does the level of controls and approval that are required.

10.3.1.2 Marine

The *Chevron Shipping's Marine Standard Non Tankers: Corporate OE Standard* (Ref. 180) identifies the requirements and activities necessary to deliver safe, reliable, and efficient third-party marine operations. This process describes key roles and responsibilities for managing marine safety and establishes measurement and verification activities designed to promote a process of continual improvement.

The Marine Standard applies to all marine vessels, emergency response, and all other (non-bulk petroleum) vessels chartered, owned, or operated by CAPL. The process also applies to vessels contracted by an affiliate or contractor that provide marine support or marine services to CAPL.

The key elements of the Marine Standard that apply to the activities outlined in this EP are:

- vessel inspections — vessels used by CAPL or its affiliates must undergo a vessel audit/inspection process before deployment to ensure that the vessels and the staffing levels meet safety requirements and are fit-for-purpose; inspections also ensure emergency procedures (such as SOPEP/SMPEP) are available and that the required standards are met for navigation equipment,

lighting, waste systems, and other marine safety protocols including Marine Order 30 (Prevention of Collisions)

- competency management — vessels used by CAPL must be operated by competent personnel who meet applicable international and local regulations
- cargo handling — cargo transport and handling operations on marine vessels must comply with handling procedures and align to standard marine industry practices
- complicated and/or heavy lifts — all lifting and installing of heavy equipment near offshore infrastructure must meet the detailed requirements
- hose management — operations involving the transfer of bulk liquids using loading hoses must align to standard industry practice and safety of the environment
- vessel communication — vessels must have in place communications procedures for operations close to installations, or other mobile units to ensure that safe positioning and communications are maintained at all times.

Vessels provide an activity-specific operational guideline, based on their use and specification, which must be accepted by CAPL.

10.3.1.3 Hazardous materials

CAPL's *Hazardous Materials Management Procedure* (Ref. 181) outlines the process for HSE assessment and approval of hazardous materials. Hazardous materials include those classified as 'hazardous substances' or 'dangerous goods'.

The Hazardous Materials Management Procedure is designed to:

- assess hazardous materials requested for procurement for their HSE risks
- ensure that appropriate controls are identified for using procured hazardous materials and that these controls are communicated to the requestors of the materials and end users at locations within CAPL's operations
- ensure no product includes CAPL-prohibited ingredients
- ensure substitutes were considered if a product contains CAPL-restricted ingredients.

As part of the hazardous materials selection process, hazardous materials that will be discharged to the environment will undergo a detailed environmental assessment. Environmental assessments are undertaken using the Hazardous Material Environment Assessment Tool (HMEAT). The HMEAT process applies a structured, risk-based methodology that integrates both the inherent hazard properties of a chemical and the context in which it is used. This environmental assessment is guided by the methodology and classification system used by the OCNS and Chemical Hazard Assessment and Risk Management (CHARM). Table 10-4 summarises the key assessment criteria applied within the HMEAT to support chemical selection and approval decisions, including the criteria used to determine when a chemical may be accepted, requires further assessment and justification, or is not accepted without additional justification and approval.

Table 10-4: Chemical assessment criteria

Classification	Criteria
CHARM Gold or Silver; OCNS Group D or E; no substitution warning	Accepted for use and discharge, provided the product is technically suitable for the intended application and does not contain CAPL-prohibited ingredients.
CHARM White, Blue, Orange or Purple; OCNS Group A, B or C; or product with a substitution warning	Subject to further environmental assessment and justification. Where technically suitable alternatives are available, substitution will be considered as part of the chemical selection process. Where substitution is not practicable, additional justification is required to demonstrate that environmental risks are reduced to levels that are ALARP and acceptable.
Products not listed under OCNS or CHARM	Subject to a detailed HMEAT assessment using available persistence, bioaccumulation and toxicity data. Chemical hazard is considered together with application and environmental sensitivity to determine the final Environmental Hazard Category. The HMEAT methodology is aligned with the environmental hazard principles of the OCNS non-CHARM framework.
Products containing CAPL-prohibited ingredients	Not approved for use or discharge. Note: CAPL-prohibited ingredients and uses are identified in the *Hazardous Materials Management Procedure* (Ref. 181).
Chemical mixtures and fluid systems (e.g. WBF, NADF, treated water)	Assessment will be undertaken at both the product and constituent level. Individual components will be assessed for toxicity, persistence and bioaccumulation using available OCNS, Harmonised Offshore Chemical Notification Format, supplier and published environmental data. In accordance with the HMEAT methodology, the chemical properties ranking is based on the relevant worst-case constituent hazard characteristics together with application-specific factors including dosage, discharge quantity and frequency, and environmental sensitivity to determine the final Environmental Hazard Category. Where OCNS-registered products or components are available, their published OCNS classifications will be used to support the assessment. Opportunities to substitute individual formulation components with less environmentally hazardous alternatives will also be considered where technically suitable.
Products with expired OCNS registration or equivalent chemical registration	Not approved for selection or use during the petroleum activity unless current registration or equivalent environmental information to support assessment through the HMEAT is available and the product has been reassessed and accepted prior to use.

The environmental assessment includes an evaluation of the potential environmental risks that could be associated with the chemical, and considers the relevant dosage, quantity and frequency of the chemical discharge, the location and nature of the receiving environment, and the assessment criteria described in Table 10-5. The final assessment decision is based on the HMEAT Environmental Hazard Ranking, which incorporates the key elements of environmental risk—hazard (persistence, bioaccumulation and toxicity), exposure (dose and discharge characteristics), and receptor sensitivity. Overall, this approach is aligned with the intent of the OCNS Framework, which also uses toxicity, persistence, and bioaccumulation as the foundation of chemical classification, while also incorporating discharge context and substitution principles to support risk-based decision making.

Table 10-5: Chemical risk assessment criteria

Assessment criteria	Selection rationale
Potential for acute and/or chronic toxicity to aquatic life	The toxicity of a chemical is the fundamental consideration within this assessment. This reflects the UK OCNS system which ranks chemicals based on their toxicity, and then adjusts rankings depending on biodegradation and bioaccumulation properties. The scale for toxicity is based on the toxicity rating classification system used by DMPE, from Hinwood et al. (Ref. 194).
Persistence or biodegradability	Biodegradation rate provides an indication of the potential persistence of the chemical within the environment, and therefore the potential duration of exposure for environmental sensitivities. The scale for biodegradation is based on adjustment criteria used by Centre for Environment, Fisheries and Aquaculture Science (CEFAS) to finalise chemical hazard assessment scores under the OCNS system.
Bioaccumulation or bioconcentration	Indicates the potential for the chemical (or components of the chemical) to accumulate within biological matrices and food chains. Chemicals which may not be toxic and are introduced to the environment in low concentrations can concentrate within biological matrices to the point where they become toxic and may have either acute or chronic effects. The scale for bioaccumulation is based on adjustment criteria used by CEFAS to finalise chemical hazard assessment scores under the OCNS system.

Where detailed assessment is required, the HMEAT determines a final Environmental Hazard Category based on the chemical properties assessment and consideration of the proposed application and environmental sensitivity. The final Environmental Hazard Category informs the chemical approval decision as identified in Table 10-6:

Table 10-6: HMEAT Environment Hazard Category and Approval

HMEAT Environmental Hazard Category	Approval outcome
Low—Category 5 or 6	Accepted for use and discharge, subject to completion of the applicable HMEAT approval requirements.
Medium—Category 3 or 4	May be accepted subject to the additional justification and approval requirements specified by the HMEAT, including consideration of substitution where applicable.
High—Category 1 or 2	Not accepted unless additional case-specific justification is provided and the applicable escalation and approval requirements specified by the HMEAT are satisfied. The justification must demonstrate why a less environmentally hazardous technically suitable alternative is not reasonably practicable and that the associated environmental impacts and risks are reduced to ALARP and acceptable levels.

Chemical selection is undertaken prior to use. Where there is a change to the chemical composition, intended application, dosage, discharge volume, discharge pathway, or environmental approval requirements, that may affect the existing assessment, the product will be reassessed through the HMEAT process. In addition, an annual review of chemicals discharged to the marine environment is undertaken, including verification of current OCNS rankings, substitution warning status, and product registration status. Where the review identifies an expired registration, revised OCNS ranking, new or revised substitution warning, availability of a less environmentally hazardous technically suitable alternative, or other information that may materially affect the existing assessment, the product will be reassessed through the HMEAT prior to further use or discharge.

The chemical selection process ensures impacts and risks associated with chemical discharge are reduced to levels that are ALARP and acceptable, while meeting operational performance requirements.

10.3.2 Process safety, reliability and integrity

10.3.2.1 OE information management

Under the OEMS, records (including compliance records to demonstrate environmental performance and compliance with commitments in this EP) will be retained in accordance with regulation 52 of the OPGGS(E)R.

The OE information management process (Ref. 182) explains how critical information related to HSE, reliability, efficiency, and process safety is to be identified, developed, assessed, and maintained so that the workforce has access to, and is using, the most current information. This document describes key roles, responsibilities, and competencies associated with the process, and includes measurement and verification activities.

MODU and vessel contractors will maintain records as above and are required to make these available upon request.

Records relevant to the petroleum activity may include:

- this EP
- induction material and attendance records
- assurance register
- inspection records and supporting evidence
- incident reports, if applicable
- routine environmental reporting
- emissions and discharge data
- relevant certificates, plans and log book records (e.g. vessel).

10.3.2.2 Management of change

MoC expectations are to manage proposed changes to design, equipment, operations and products before they are implemented. In conjunction with the ERMP (Section 10.3.3.1) and *Australian OE Risk Management Process* (Section 10.3.5), the *Management of Change for Facilities and Operations process* (Ref. 183) is followed to document and assess the impact of changes to activities described in this EP. These changes will be addressed to determine if there is potential for any new or increased environmental impact or risk not already provided for in this EP. If these changes do not trigger relevant petroleum regulations as detailed below, this EP will be revised, and changes recorded in the EP without resubmission.

For this petroleum activity, the following would trigger an MoC:

- change to the activity scope (e.g. timing, vessel, equipment, etc.) that may result in new environmental aspects or changes to existing environmental aspects
- new objections or claims received from relevant persons that are assessed to have merit

- non-conformances or opportunities for improvement which indicate that control measures may not be managing environmental impacts and risk to ALARP and acceptable levels
- incidents which identify new or increased impacts and risks arising from activities not previously identified in the accepted EP.

In addition, CAPL's *Description of the Environment – Operational and Scientific Monitoring Planning Area* (Appendix G of the OSM-BIP; Ref. 5) is reviewed annually. This review incorporates changes to knowledge of the receiving environment (e.g. EPBC listed species, Part 13 statutory instruments [i.e. recovery plans, threat abatement plans, conservation advice, wildlife conservation plans], requirements for AMPs, First Nations cultural heritage, etc.). Where these revisions introduce the potential for any new or increased environmental impact or risk not already provided for in this EP, these will be assessed via the MoC process.

In accordance with regulations 38 and 39 of the OPGGS(E)R this EP must be resubmitted to NOPSEMA in the following circumstances:

- before commencing a new activity, or any significant modification or new stage of the activity, not provided for in this EP
- if a change in the titleholder results in a change in the manner in which the impacts and risks of the activity are managed
- as soon as practicable after the occurrence of any significant new environmental impact or risk, or significant increase in an existing environmental impact or risk, that is not provided for in this EP
- as soon as practicable after the occurrence of a series of new environmental impacts or risks, or a series of increases in existing environmental impacts or risks, occur which, taken together, amount to the occurrence of a significant new environmental impact or risk, or a significant increase in an existing environmental impact or risk, not provided for in this EP.

10.3.3 Environment

The Environment OE focus area provides CAPL's framework for the protection of the environment and community health using a risk-based approach that addresses potential environmental impacts.

10.3.3.1 Environmental risk management

The EMRP (Ref. 184) provides a framework for CAPL to identify, assess, mitigate, and manage environmental risks, including environment-related community health and social risks, across the life-cycle of CAPL assets.

The objectives of the process are to:

- establish standardised methodologies for the data-driven assessment and management of environmental risks
- identify environmental safeguards and mitigation measures, and support prioritisation of their verification
- support assurance activities for environmental safeguards and mitigation measures

- maintain environmental information associated with the evaluation of environmental risks
- utilise the management system cycle process to identify improvement opportunities for the ERMP.

The environmental impact and risk process is summarised in Section 6. Additional impact and risk assessments may also be undertaken in triggered by the MoC Process (Section 10.3.2.2).

10.3.3.2 Quarantine

The *Quarantine Procedure Marine Vessels* (Ref. 185) provides information about quarantine compliance to CAPL, contractors, and others associated with marine vessels.

The purpose of this procedure in relation to the offshore title areas is to prevent offshore facilities and activities associated with CAPL title areas becoming staging areas for the introduction of marine pests into Australian waters and ports.

This procedure also outlines the requirements for vessels operating in title areas and details the premobilisation requirements and ongoing management of vessels operating in title areas.

All vessels operating in title areas must comply with applicable Australian biofouling and ballast water requirements to prevent the introduction and spread of IMPs. Regardless of the origin of the vessel or where it will be operating, all vessels must be free from IMPs when mobilised and the contractor must demonstrate the vessel meets low risk rating for biofouling.

As per the *Quarantine Procedure Marine Vessels* (Ref. 185), CAPL undertakes a risk assessment before any vessel is mobilised to title areas to confirm the vessel meets the requirements for accessing these areas. For this purpose, each vessel contractor submits a completed Marine Vessel Questionnaire with supporting evidence to CAPL for assessment.

This risk assessment will consider the vessel's attributes and history, including wetsides cleaning, internal sea water system and ballast water treatments and management, application of anti-foul coating, and recent transit history, including time in known high-risk waters.

If the vessel's history is unknown or if there is a moderate risk of IMP presence, additional actions must be undertaken. These action items (which may include requirements such as dry-dock, hull cleaning, etc.) will be issued to the contractor to implement. Only once a vessel has met the requirements of the *Quarantine Procedure Marine Vessels* (Ref. 185), CAPL will issue a Vessel Mobilisation Certificate.

10.3.3.3 Bulk products

The process for managing unused bulk product (Figure 10-4) outlines the decision-making steps involved at the end of drilling activities in the MODU. The process prioritises reuse opportunities and consideration of onshore disposal options before overboard discharge is considered. Each decision point considers operational feasibility and potential environmental impacts and risks, ensuring that actions align with the ALARP decision context.

In addition, CAPL has a commercial arrangement in place to utilise IsoPump technology for the safe backloading and transport of surplus bulk powdered

products to shore. The availability of this technology supports the onshore disposal pathway identified in Figure 10-4 where the risk assessment determines that onshore disposal is a feasible and appropriate management option.

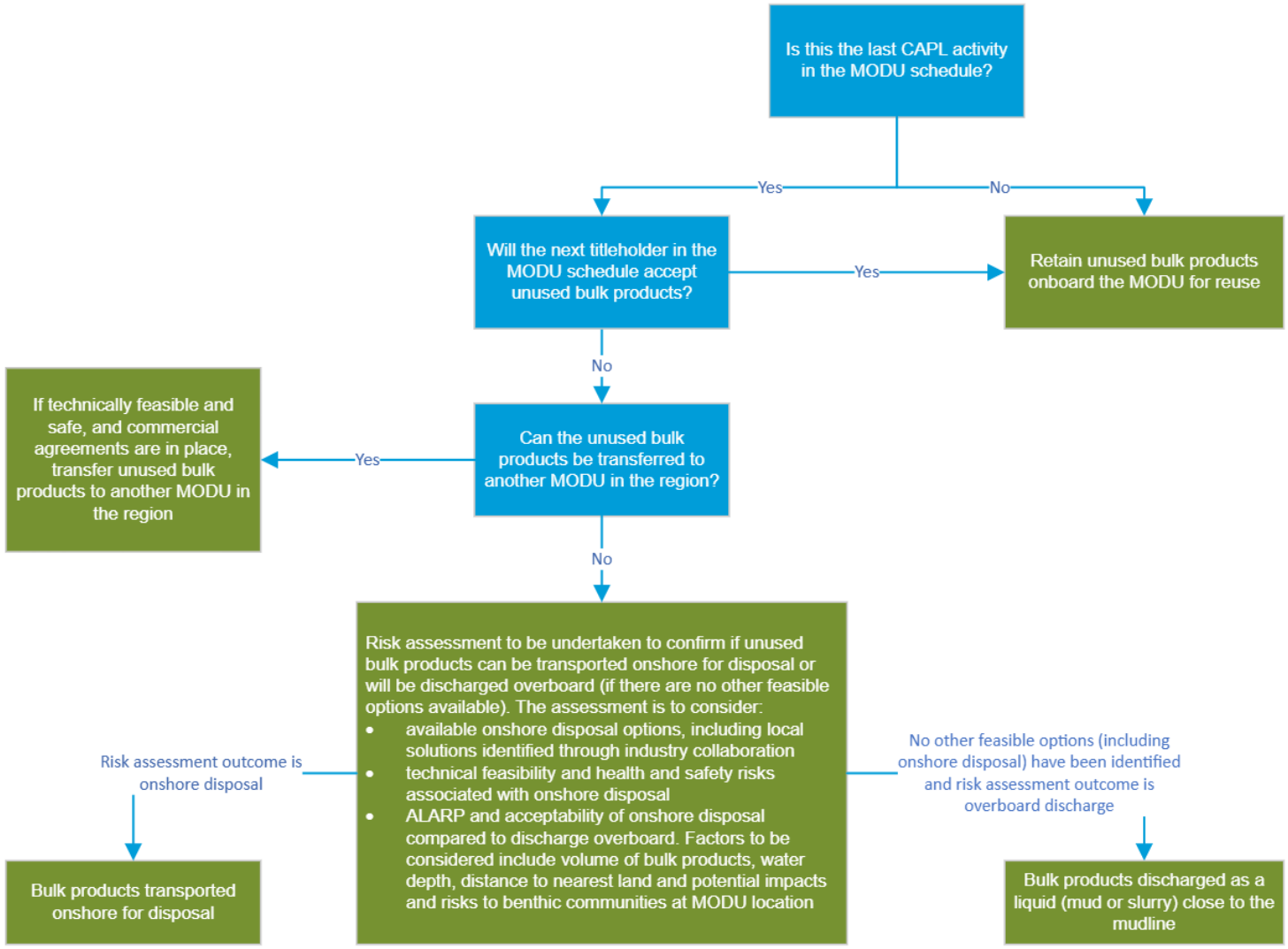


Figure 10-4: Process for management of unused bulk product

10.3.4 Stakeholders

Stakeholder engagement expectations are to manage social, political, and reputational risks to CAPL (and Chevron), address potential business impacts, and generate business value by:

- identifying, assessing, and prioritising issues
- building and maintaining relationships with external stakeholders, including governments and the communities where CAPL operates
- developing and executing issue management and stakeholder engagement plans, tracking engagements and issues, and validating the effectiveness of plans.

The *Stakeholder Engagement and Issues Management Process* (Ref. 186) details an integrated approach for engaging stakeholders and managing external stakeholder issues. This process describes key roles and responsibilities for stakeholder engagement, establishes measurement and verification activities designed to monitor the effectiveness of the stakeholder engagement process and to promote continual improvement.

10.3.4.1 Ongoing consultation with relevant persons

In accordance with regulation 22(15) of the OPGGS(E)R, CAPL will undertake ongoing consultation for this petroleum activity with relevant authorities and other relevant interested persons or organisations for this petroleum activity as described in Table 10-7.

Through co-design of consultation, CAPL will agree processes for ongoing consultation with relevant persons. This may include consultation on the ongoing environmental performance of the petroleum activity and review of applicable control measures with the relevant persons. Engagement agreements and consultation plans with relevant persons are included in the sensitive information report. Records for ongoing consultation with relevant persons will be recorded and maintained in CAPL's online tracking engagements system.

Any objections or claims arising from ongoing consultation that have merit and have the potential to result in changes to the description of environment, impact or risk assessment, or control measures, will be subject to CAPL's MoC process, in accordance with Section 10.3.2.2.

If a new relevant person is identified during the in-force period of the EP, CAPL will provide sufficient information to that relevant person (as described in Section 7.6) and will assess the merits of the objections or claims of that relevant person in accordance with Section 7.6 and CAPL's MoC process (Section 10.3.2.2).

Table 10-7: Notifications and ongoing consultation

Relevant person	Notification or ongoing consultation requirement	Timing	Frequency
Notifications			
AHO	Provide information to enable promulgation of Notice to Mariners Notify AHO via datacentre@hydro.gov.au	At least four weeks before commencing activities, or as otherwise agreed with AHO.	Once, prior to activities commencing.

Relevant person	Notification or ongoing consultation requirement	Timing	Frequency
AMSA	Provide information to enable promulgation of radio navigation warnings Notify AMSA's JRCC via rccaus@amsa.gov.au (phone: 1800 641 792 or +61 2 6230 6811).	At least 24 to 48 hours before commencing activities, or as otherwise agreed with AMSA.	Once, prior to activities commencing.
Relevant persons (that have requested ongoing notifications) including: • AFMA • Santos • Shire of Carnarvon • Tuna Australia • WAFIC	CAPL will provide a pre-start notification confirming the start date of the petroleum activity.	At least two weeks before commencing activities.	Once, prior to activities commencing.
	CAPL will provide notification following completion of the petroleum activity.	Within two weeks of completion of activities.	Once post activity completion.
Relevant persons (that have requested ongoing notifications) including: • Tuna Australia	CAPL will provide a pre-start notification confirming the start date of the petroleum activity.	At least 48 hours before commencing activities.	Once, prior to activities commencing.
Relevant persons (that have requested ongoing notifications) including: • DoD	CAPL will provide a pre-start notification confirming the start date of the petroleum activity.	At least five weeks before commencing activities.	Once, prior to activities commencing.
Potentially affected relevant persons and/or relevant persons that have requested emergency event notifications, including: • DBCA's Pilbara regional office • WAFIC • First Nations people and/or representative bodies	CAPL will provide an incident notification if an unplanned emergency event occurs that is likely to affect the functions, interests, or activities of the identified relevant person.	As soon as practicable within an emergency response.	Once, post unplanned emergency event.
Ongoing consultation			
Potentially affected relevant persons	CAPL to advise of any new or significant changes to activities or impacts/risks within the scope of the EP, following an evaluation as per Section 10.3.2.2, that may potentially impact marine users functions, interests, or activities.	Prior to new or significant changes to activities or impacts/risks occurring.	As required.
WAFIC	To inform of changes to activities or impacts/risks occurring that may affect fisheries Notify WAFIC via oilandgas@wafic.org.au.	Prior to new or significant changes to activities or impacts/risks occurring.	As required.

Relevant person	Notification or ongoing consultation requirement	Timing	Frequency
First Nations people and/or representative bodies	CAPL to continue engagement with First Nations people and/or representative bodies regarding identifying and understanding the cultural values or features that may be present within the Hydrocarbon EMBA (refer to Section 10.3.4.3).	Ongoing.	Ongoing.
	Any new information on cultural values or features within the Hydrocarbon EMBA, and subsequent changes to activities or impacts/risks within the scope of the EP, will undergo an MoC evaluation as per Section 10.3.2.2.	Ongoing.	Ongoing.
	CAPL to advise of any new or significant changes to activities or impacts/risks within the scope of the EP, following an evaluation as per Section 10.3.2.2, that may potentially impact the functions, interests and activities of First Nations people and/or representative bodies.	Prior to new or significant changes to activities or impacts/risks occurring.	As required.
	If an unplanned emergency event occurs that is likely to affect the functions, interests, or activities of First Nations people and/or representative bodies, CAPL will commence engagement with the relevant person and/or representative bodies.	As soon as practicable within an emergency response.	Once, post unplanned emergency event.
DCCEEW	CAPL to advise of any new or significant changes to activities or impacts/risks within the scope of the EP, following an evaluation as per Section 10.3.2.2, that may potentially impact UCH (as protected by the UCH Act).	Prior to new or significant changes to activities or impacts/risks occurring.	As required.

10.3.4.2 Consultation in the event of an emergency

In the event of an emergency hydrocarbon spill event, CAPL will commence oil spill trajectory modelling using the actual inputs associated with the spill event to predict trajectory, as described in the OPEP (Ref. 2).

Once oil spill trajectory modelling is completed, CAPL will start engaging with potentially affected relevant persons (those considered relevant from Table 7-3, and any additional relevant persons identified under Section 10.3.4.1), plus any others identified from the oil spill trajectory modelling. This engagement will include WAFIC and any potentially affected commercial fisheries as required. The process for reaching out to these relevant persons includes direct contact (phone or email) or indirect contact via the CAPL website.

In the event of other emergency events (e.g. potential reportable incident), CAPL will commence any emergency management as required (and in accordance with Section 10.3.9), and consultation with required departments or agencies will occur as per regulatory requirements (e.g. refer to Table 10-17 for incident reporting requirements).

CAPL will also notify any relevant persons (as identified in Table 7-3, and any additional relevant persons identified under Section 10.3.4.1) that requested to be notified in the event of an oil spill or in the event of any other emergency event (Table 10-18).

10.3.4.3 Ongoing engagement with First Nations representative bodies

Through the consultation process in preparation of this EP (Section 7), several potential initiatives or scopes for ongoing engagement with First Nations representative bodies were identified, including consideration of:

- ranger programs
- capacity building for emergency response support
- support to assist with identifying and articulating the cultural values and features of Country, including Sea Country values.

These initiatives/scopes are being discussed and progressed with the respective representative bodies.

Where requested, formal engagement plans and/or consultation protocols are in development and once agreed to by CAPL and the relevant representative body, these will be implemented.

Table 10-8 provides a summary of the objectives, scope, and responsibilities of the engagement plans and/or consultation protocols drafted to date. Further information on ongoing consultation and relationship building with First Nations representative bodies is presented in Table 10-9.

Table 10-8: Summary of objectives, scope, and responsibilities in engagement plans and/or consultation protocols

Objectives	Scope	Responsibilities
• provide governance and strategic oversight to guide collaboration and communications • sets out general terms for allocation of resources and recovery of reasonable costs • establish a framework for ongoing consultation • outlines the principles for building relationships: – co-design and co-decide – transparency – walking together.	• consultation meetings • consultation funding • review of information relating to CAPL proposals • confidentiality • negotiation principles • dispute resolution • general correspondence.	CAPL responsibilities: • design and plan engagements in advance • engage in person and aim to provide information in plain English • provide access to internal subject matter experts as well as support for external and independent advice • meet reasonable costs and expenses. Joint responsibilities: • share plans and strategies with each other • plan and engage early and work together on issues • use the negotiations to build trust and goodwill and to negotiate in good faith • spend time together outside of the boardroom.

Table 10-9: First Nations representative bodies ongoing consultation and relationship building

First Nations representative body	Ongoing Consultation	Relationship Building
BTAC	• CAPL has executed an interim cost recovery agreement with BTAC for ongoing consultation and CAPL and BTAC have finalised a longer-term funding agreement • CAPL providing support to BTAC to initiate cultural mapping program.	• CAPL has provided and is implementing an agreed Engagement Plan • cost recovery mechanisms in place for informal meetings with BTAC including on country meetings and events • CAPL has invited BTAC to an on-country consultation on Barrow Island • CAPL has supported BTAC with an expression of interest to participate in a joint venture with the Pilbara Development Commission on the Northern Native Seed Initiative (2024) • CAPL provided opportunity to participate in Chevron Community Spirit Grant program • CAPL has provided support to BTAC to commence the first phase of a cultural mapping program • invitation to participate in MFO training in September 2024 and 2025 • CAPL provided opportunities for oil spill training in Perth in 2024 and 2025 • invitation to participate in Gorgon Turtle Monitoring Program on Barrow Island in January 2025 • CAPL provided opportunities to participate in workshops and attend the 25th Biennial Conference on the Biology of Marine Mammals in Perth in November 2024.
MCH	• CAPL has provided an engagement plan and consultation protocol which includes cost recovery • CAPL working with MCH to forecast consultation requirements and schedule.	• CAPL has provided an Engagement Plan and Consultation Protocol which provides cost recovery for informal meetings with MCH including on country meetings to learn more about Country and Sea Country • CAPL has provided an on-country consultation at Barrow Island and tour (2 nights) • invitation to participate in MFO training in September 2024 and 2025 • CAPL provided opportunities for oil spill training in Perth in 2024 and 2025 • on-country meetings in 2024 • invitation to participate in Gorgon Turtle Monitoring Program on Barrow Island in January 2025 • CAPL provided opportunities to participate in workshops and attend the 25th Biennial Conference on the Biology of Marine Mammals in Perth in November 2024.
NCG	• CAPL and NCG are developing a consultation protocol which provides	• invitation to participate in MFO training and oil spill training in August 2025

First Nations representative body	Ongoing Consultation	Relationship Building
	cost recovery and agreed meeting schedule.	• CAPL provided opportunities for oil spill training in Perth • CAPL are working with NCG on a visit to Barrow Island and discuss future Ethnographic survey opportunities.
NTGAC	• CAPL has completed a workshop with the NTGAC board to design ongoing consultation • CAPL has provided an Engagement Plan to NTGAC which provides cost recovery for informal meetings with NTGAC including on country meetings and events • CAPL working with NTGAC to forecast consultation requirements and schedule for 2026.	• CAPL has offered funding support to NTGAC for a resource to assist with consultations and the development of the corporation • CAPL invited NTGAC participants to attend the Roebuck Challenge Oil Spill Response Training in Broome (October 2023) • CAPL provided opportunity to participate in Chevron Community Spirit Grant program • invitation to participate in MFO training in September 2024 and 2025 • CAPL provided opportunities for oil spill training in Perth in 2024 and 2025 • CAPL provided opportunities to participate in workshops and attend the 25th Biennial Conference on the Biology of Marine Mammals in Perth in November 2024 • CAPL has participated in On-Country meetings with NTGAC representatives.
WAC	• CAPL have confirmed cost recovery for consultation meetings and have provided WAC a draft consultation protocol • CAPL working with WAC to forecast consultation requirements and schedule for 2026 • CAPL working with WAC to co-design ongoing consultation.	• CAPL invited WAC participants to attend the Roebuck Challenge Oil Spill Response Training in Broome (October 2023) • CAPL provided WAC Board and Elders opportunity to spend time on Barrow Island in 2023 • CAPL has provided WAC funding support to employ a Ranger Coordinator • CAPL supported WAC with an expression of interest to participate in a joint venture with the Pilbara Development Commission on the Northern Native Seed Initiative • CAPL provided Chevron Community Spirit Grant in 2025. • CAPL provided opportunities to participate in workshops and attend the 25th Biennial Conference on the Biology of Marine Mammals in Perth in November 2024. • Invitation to participate in MFO training in September 2024 and 2025 • CAPL provided opportunities for oil spill training in Perth in 2025.

10.3.5 Risk management

The *risk management process* (Ref. 156) assesses and identifies safeguards, which are the hardware and human actions designed to directly prevent or mitigate an incident or event and is designed to be consistent with the environmental risk management requirements of *ISO 14001 Environmental Management System* (Ref. 178) and *ISO 31000:2018 Risk management – Principles and guidelines* (Ref. 158).

This risk management process is summarised in Section 6 of this EP. Additional risk assessments must be undertaken if the MoC process (Section 10.3.2.2) is triggered. Risk assessments are undertaken in accordance with this process.

The *Australia OE Risk Management Process* (Ref. 156), ERMP (Ref. 184), and the *Management of Change for Facilities and Operations process* (Ref. 183) are the key systems CAPL uses to ensure, that in accordance with regulation 22(2)(a) of the OPGGS(E)R, the impacts and risks of the petroleum activity continue to be identified and reduced to ALARP.

10.3.6 Assurance

Within the OEMS, assurance is a common expectation that supports the OE objective of each focus area. The *OE Compliance and Assurance Standard* (Ref. 187) enables CAPL to deliver assurance that safeguards are established and functioning; it details:

- a framework for managing verification activities that assure that CAPL complies with applicable legal and OEMS requirements
- a process to identify, report and resolve potential noncompliance
- the minimum qualifications and organisational capability to execute this process.

The *Australia OE Assurance Plan* (Ref. 195) documents the CAPL Australian integrated assurance system and associated assurance activities (Figure 10-5). The *Australia OE Assurance Plan* is reviewed and approved annually and includes:

- a list of OE assurance priorities based on risk
- a schedule of assurance activities to evaluate safeguards and verifications (e.g. safeguard assurance workshops, audits, and assurance programs)
- reference to project and asset assurance plans that outline asset specific assurance activities and risk-based frequency (i.e. field inspection programs, audits, compliance reviews, performance reviews).

To support the implementation of the *OE Compliance and Assurance Standard* (Ref. 187), CAPL has developed an integrated assurance system (Figure 10-5), which integrates and leverages assurance activities across the various levels of CAPL business through to the corporate level—to provide confidence that safeguards are in place and functioning as intended. This integrated assurance system includes:

- **Level 1 – Monitoring, testing and frontline assurance**: ongoing, routine, planned verifications of safeguards specific for the asset/facility (e.g. inspections, preventive maintenance, emergency drills and exercises)

- **Level 2 – OE assurance**: OE assurance activities (e.g. assessments, reviews, audits, inspections) that verify safeguards are in place and functioning, and validate that L1 assurance is effective. These assurance activities monitor weaknesses in the management system and compliance with regulatory requirements, and input learnings into the management system cycle.
- **Level 3 – Corporate and functional assurance**: Assurance activities undertaken by Chevron, CAPL's functional groups (e.g. HSE, Drilling and Completions, base business) or third parties. These assurance activities test effectiveness of the focus area's complete assurance system and how associated safeguards are being sustained.

Assurance activities are scheduled on a risk-based approach and conducted to verify the effectiveness of safeguards and verifications and the extent to which requirements are met by CAPL.

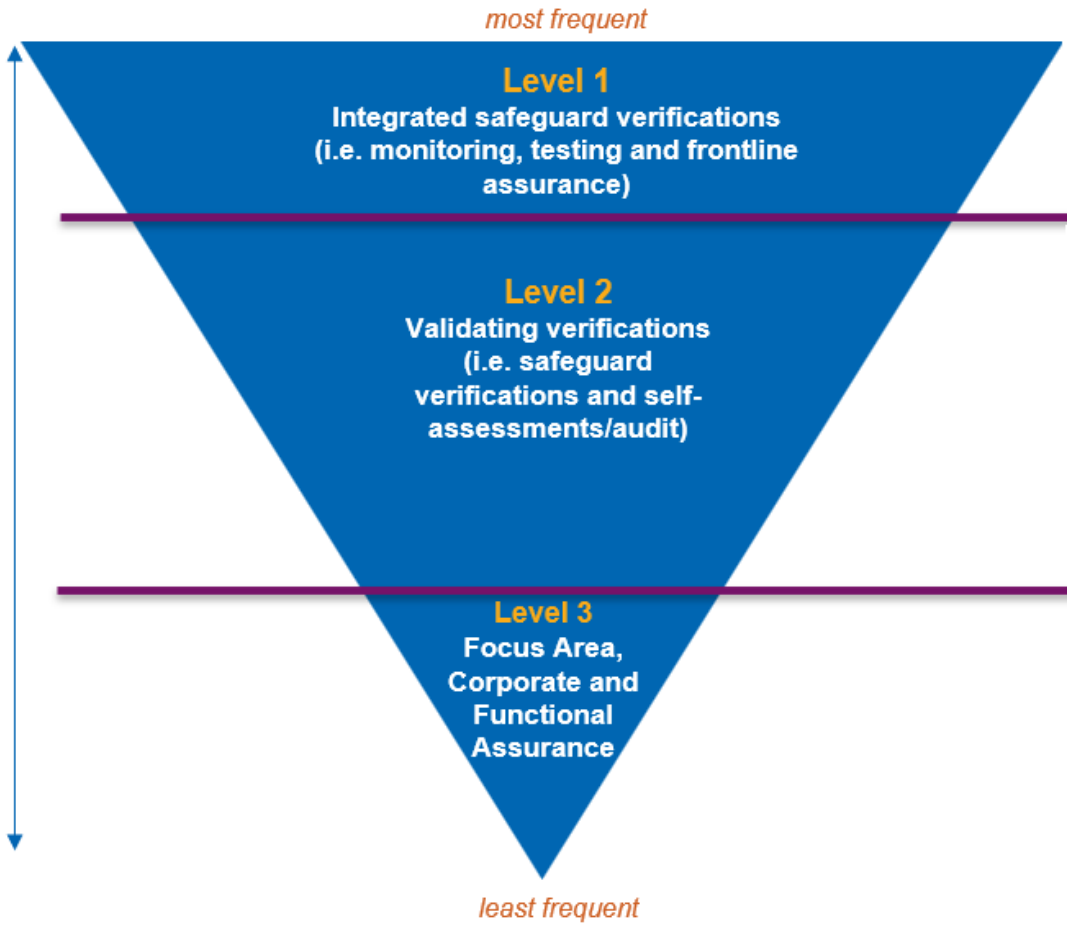


Figure 10-5: Integrated assurance system

Assurance activities focus on in-field activities and administrative processes, depending on the activities being undertaken and assurance priorities (these priorities are based on risk) and provide sufficient demonstration that EPOs and EPSs have been met, and the activity is implemented in accordance with this implementation strategy. A record of all assurance activities undertaken, and the outcomes, are maintained and actions are tracked until closure.

Assurance Register

Prior to the commencement of the petroleum activity, an Assurance Register specific to the requirements of this EP will be developed. The Assurance Register will detail the commitments established in the EP, including those related to the EPOs/EPSs, implementation strategy (where relevant) and stakeholder consultation. Additionally, the Assurance Register includes details regarding evidence verification method and timing.

Assurance activities will be undertaken in accordance with the *OE Compliance and Assurance Standard* (Ref. 187). Any potential non-conformances or opportunities for improvement will be identified, and corrective actions associated with these will be implemented as soon as practicable. Corrective actions will be delegated to the person deemed most appropriate to fulfil the action. Records of inspections will be maintained in accordance with Section 10.3.2.1.

Inspections

Inspection/audit activities are scheduled on a risk-based approach, taking into consideration the type and duration of the petroleum activity, values and sensitivities of the receiving environment, and the potential environmental impacts and risks.

During this petroleum activity, weekly Level 1 HSE inspections will be conducted. Level 1 HSE inspections check compliance against a selection of commitments across different aspects (such as waste, lighting, spill prevention, and general housekeeping) from the Assurance Register. These regular Level 1 HSE inspections help ensure that activities remain in compliance with the commitments established in this EP.

. A Level 2 environmental compliance audit will be conducted at least once during each 12 month period of the petroleum activity to review compliance of the commitments established in the EP. These Level 2 audits are also used to inform the annual (and/or end of activity) compliance reviews and environmental performance reporting.

Compliance review

EPSs in the EP will undergo a compliance review and evidence will be gathered for each EPS to support the annual (and/or end of activity) environmental performance reporting. Environmental performance during the petroleum activity will be reviewed to ensure that EPSs and EPOs are being met, reviewed and where necessary, amended to continue to manage the environmental impacts and risks of the petroleum activity to ALARP and acceptable levels.

Assurance related to the petroleum activity described in this EP will be summarised in the environmental performance report submitted to NOPSEMA (Section 10.6.3).

10.3.6.1 Managing instances of potential non-conformance

The reporting, investigation, and tracking of non-conformances are managed via *Chevron's OE Corporate Standard Incident Investigation* (Ref. 188) and *OE Data Reporting Standard* (Ref. 189). These processes apply to instances where the requirements of this EP have not been met. This process is used if audit findings identify that activities in the scope of this EP are not being implemented in accordance with the risk and impact control measures identified in Section 8.

Audit findings and corrective actions are recorded and tracked in a CAPL compliance assurance database for timely closure of actions. As per Section 10.3.6, any corrective action/s identified during environment inspections is required to be implemented as soon as practicable during the petroleum activity. Audit findings that identify a breach of an EPO or EPS will be reported in accordance with Section 10.6.2.

Any suggested changes to activities or control measures arising from audit findings or instances of potential noncompliance will be subject to a MoC process in accordance with Section 10.3.2.2.

10.3.7 Contractor operational excellence management

The *Contractor Operational Excellence Management (COEM) Process* (Ref. 190) is designed to ensure OE/HSE risks are managed effectively during contract execution. The COEM process seeks to establish clear accountabilities, ensure active engagement of contractors, and provide a consistent COEM program to help prevent serious incidents and fatalities and high-consequence events involving contractors. When CAPL appoints the primary contractor to control work using their management system, a gap analysis between the CAPL OEMS and the contractor's management system is undertaken to ensure the contractor's management system meets applicable OEMS requirements.

10.3.8 Incident investigation and reporting

Incident investigation and reporting (II&R) expectations are to identify, report, record and investigate incidents, analyse trends, correct deficiencies, and share and adopt relevant lessons learned.

The *II&R Execution Manual* (Ref. 191) defines the requirements to report, classify, record, and investigate incidents and near misses, including but not limited to injury, occupational illness, environmental impact, reliability, business disruption, and community concern.

The II&R process includes these requirements:

- training for employees and contractors to recognise and report events
- internal and external notification of events
- investigating incidents at the probable level of consequence, with the rigor of investigation based upon learning opportunity and incident severity
- allocating an incident management sponsor for selected investigations
- sharing alerts, lessons learned, and bulletins
- tracking recommended actions to closure
- analysing event trends.

Events that meet the required criteria are recorded in the CAPL incident management system (IMS). The system holds records of the associated investigation results. The lessons learned from selected investigations are shared to reduce the likelihood of future comparable events.

Specific incident reporting requirements for this EP are detailed in Section 10.6.2.

10.3.9 Emergency management

CAPL's emergency management implementation strategy is described in the following sub-sections. EPO, EPS and MC relating to CAPL's emergency management implementation strategy are included in Section 8.16.6.

In addition to CAPL's overarching emergency management strategies, and with specific reference to vessel-based activities, an approved SOPEP will also be in place (in accordance with vessel class requirements) as required by MARPOL 73/78 Annex I and Marine Order 91 (Marine pollution prevention – oil). In the event of a vessel-based spill event the SOPEP will be implemented by the Vessel Master.

SOPEPs are described in Sections 8.15.6, and requirement have not been duplicated here.

10.3.9.1 Response document interfaces

In the event of an oil spill the overarching *Australia Emergency Response Plan* (Ref. 193) interfaces with the OPEP (Ref. 2) and OSM-BIP (Ref. 5), the SCERP (Ref. 196) and *WCD Calculation and Relief Well Planning SOP* (Ref. 197) (Figure 10-6;Table 10-10).

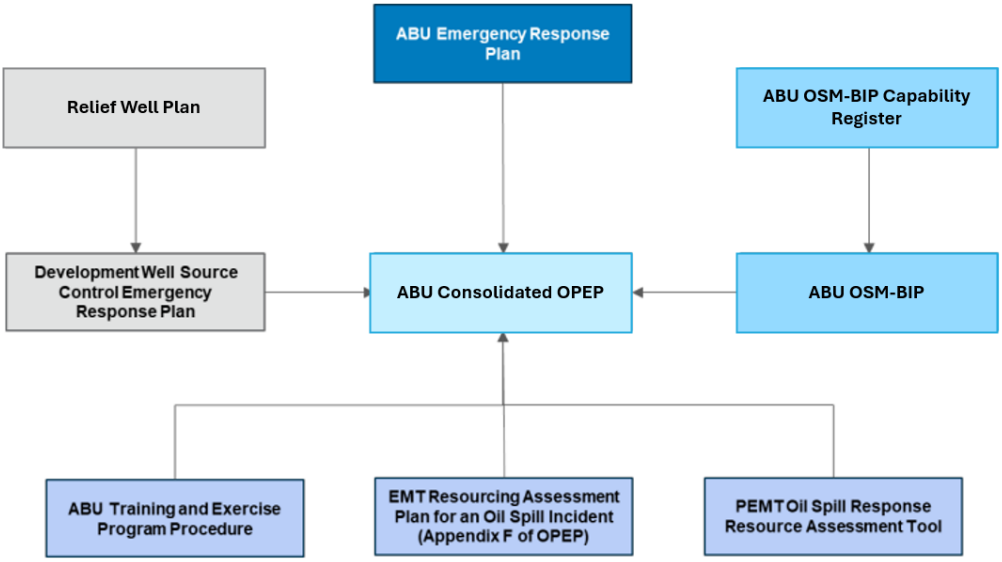


Figure 10-6: Oil spill response document interface for G&E drilling

Table 10-10: Summary of oil spill response documentation

Document	Description
All CAPL activities	
Emergency Response Plan (Ref. 193)	The ERP describes the emergency management, governance, and coordination arrangements for the Perth Emergency Management Team (PEMT) for emergency incidents across the ABU.
OPEP (Ref. 2)	The OPEP outlines specific emergency response options and tactics to respond effectively to an oil spill, should a spill occur where CAPL is the Nominated Titleholder (Commonwealth) or Operator (State).
OSM-BIP (Ref. 5)	The OSM-BIP describes the types of environmental monitoring that may be implemented during an emergency event that results in an oil spill to marine or

Document	Description
	coastal waters. The OSM-BIP is the principal tool for determining the extent, severity, and persistence of environmental impacts from an oil spill. It comprises two types of monitoring: operational and scientific.
Chevron Emergency Management Training and Exercise Program Procedure (Ref. 198)	This document outlines the competencies and training requirements for the EMT, On-site Response Team (ORT), and other personnel during implementation of the OPEP. It includes a summary of oil spill response management training that has been designed to align with the knowledge requirements outlined in the AEP Guidance Document: *Incident Management Teams – Knowledge Requirements for Responding to Marine Oil Spills* (Ref. 199), specifically the general knowledge requirements for all EMT members and the EMT function specific knowledge requirements.
PEMT Oil Spill Response Resource Assessment Tool (Ref. 200)	This live tool provides a real time assessment of resources available to CAPL to fill the core and support positions identified in the *EMT Resourcing Assessment Plan for an Oil Spill Incident* (Appendix F in the OPEP [Ref. 2]). It quantifies the core and support EMT capability requirements specific to the worst credible scenario described in this EP and demonstrates CAPL has access to personnel to meet the requirements of the Capability Assessment.
Activity-specific (well activities)	
SCERP (Ref. 196)	This SCERP outlines the source control response arrangements in place for the proposed drilling activity. This document provides the Source Control Branch within the EMT with guidance and checklists for implementing source control strategies in the event of a LOWC.
WCD Calculation and Relief Well Planning SOP (Ref. 197)	This Relief Well Plan provides the detailed design of a relief well and proposed locations. This document supports the SCERP.

10.3.9.1.1 Source control emergency response plan

The SCERP (Ref. 196) contains all steps necessary to affect the direct intervention on a well that has experienced LOWC, with the intent to halt or control the release of hydrocarbons to the environment. This may include:

- BOP intervention
- SSDI
- relief well drilling
- capping stack installation.

The SCERP (Ref. 196) structure was specifically developed to align with relevant industry guidance and standards, including the AEP *Australian Offshore Titleholders Source Control Guideline* (Ref. 201), IOGP's *Source Control Emergency Response Planning Guide for Subsea Wells* (Ref. 202) and NOPSEMA's *Source control planning and procedures Information Paper* (Ref. 203). The SCERP also aligns with source control response expectations within CAPL.

The SCERP (Ref. 196) aligns with the content requirements of the industry guidance and standards documents, and includes:

- source control IMT arrangements and notifications
- source control training and emergency exercises
- response time modelling for source control strategies

- WCD calculation
- relief well planning
  - locations and designs
  - relief well dynamic well kill plan
  - relief well long lead inventory management.
- plume and dispersion study
- source control resources
  - mutual aid arrangements via AEP (previously APPEA) MoU
  - response vessels and tracking.
- capping stack landing analysis and capping stack selection
- BOP intervention
  - well or BOP to capping stack interface analysis.
- debris clearance
- subsea dispersant operations and supply planning
- capping stack
  - capping stack and ROV interfaces
  - capping stack mobilisation and deployment planning
  - wellhead structural integrity analysis.
- SIMOPS planning.

10.3.9.1.2 Relief well plan and capping stack

As per the SCERP (Ref. 196) and associated RTMs, deployment of a capping stack is the primary source control option for the G&E drilling given that the well is in water depths >1,000 m. However, in the event of LOWC, the drilling of a relief well may commence in parallel to capping operations. Detailed information on relief well planning is contained in the *WCD Calculation and Relief Well Planning SOP* (Ref. 197).

CAPL relief well planning is based on internal company standards — the *Wells WCD Calculation and Relief Well Planning SOP* (Ref. 197) and the *Chevron Corporate CTC Business Unit Source Control Response Plan* (Ref. 204). These internal standards are aligned with the content and strategy outlined in the OGUK's *Guidelines on Relief Well Planning for Offshore Wells* (Ref. 205).

10.3.9.2 Emergency management arrangements

The emergency management arrangements outline a systematic approach for planning, responding to, and recovering from emergency events and are intended to provide a standardised management and response structure that details emergency management documentation, Emergency Response Organisation (ERO), facilities and equipment, and training and exercises.

The ERO provides a standardised management and response structure for any emergency. Personnel filling roles within this structure may include full and part-

time CAPL employees from across the workforce with event-specific or subject matter expertise.

The system used to organise CAPL's EMTs is based on the Incident Command System (ICS) and provides a standardised approach to the coordination of an emergency response across all hazards, including oil spill response. This program is compatible with the Australasian Inter-service Incident Management System, and the National Plan for Maritime Environmental Emergencies (National Plan; Ref. 206) and is consistent with the core aspects presented in the IMO equivalent courses.

The ERO comprises the groups listed in Table 10-11; this table also describes the major functions of teams during an emergency.

Figure 10-7 to Figure 10-9 outline the organisational chart of the ORTs and EMTs. The Crisis Management Team (CMT), which focus on the business implications of incidents and events, are further described in the *Australian Crisis Management Plan* (Ref. 207).

As the incident escalates and the workload of each function increases, it may be necessary to delegate specific roles to additional people within each section. These roles may lead a team of people to fulfil the tasks under their control.

To establish emergency response arrangements that can be scaled up or down depending on the nature of the incident by integrating with other local, regional, national, global, and industry plans and resources, CAPL has adopted a tiered approach in its response system. This tiered-response model scales the number of resources mobilised for a response, and the emergency team activated, according to the severity of the incident. This approach is consistent with the *International Convention on Oil Pollution Preparedness, Response and Cooperation 1990*. The response tiers and resources that may be mobilised for an oil spill incident within CAPL are further described within the OPEP (Ref. 2).

Table 10-11: CAPL emergency management teams

Team	Description
Tier 1 (CAPL)	
ORTs	Trained responders at the installation who are responsible for on-scene tactical response operations during an incident. ORTs are led by an On-scene Commander (OC) who has incident control during smaller Level 1A incidents, which do not require further escalation to an incident management team. If the IEMT is activated, the OC will come under the direction of the Operations Section Chief (OSC).
Installation Emergency Management Team (IEMT)	The IEMT is led by an Incident Commander (IC) and operates out of an on-site emergency command centre. The IEMT may be activated to take control of Level 1B incidents and coordinate local resources and ORTs.
PEMT	The PEMT is led by an IC and operates out of a Perth-based emergency command centre. The PEMT may be activated in a support role to assist IEMTs with the emergency response to major incidents that require coordination of further resources, personnel, and support. If required, incident control may also be transferred from the installation to the PEMT to manage the ongoing response (proactive phase) for long-duration, complex incidents such as a major oil spill. The PEMT stands up at the direction of the PEMT IC for Level 2 and 3 incidents.

Team	Description
CAPL CMT	Comprises senior CAPL executives and ensures emergency response and crisis management operations are carried out consistent with The Chevron Way, Chevron Corporation policies, and the tenets of OE. The CMT stands up at the direction of the CAPL Crisis Manager for Level 3 incidents.
Tier 2 (Regional response)	
Chevron Corporation's Asia – Pacific Regional Response Team	An enterprise-level team able to support CAPL during the initial response (reactive phase) to a significant incident and help manage the transition to the ongoing response (proactive phase).
Tier 3 (Global response)	
Chevron Corporation's Functional Response Teams	Enterprise-level teams with specific technical expertise in selected command staff positions and unit positions in the Planning, Logistics, and Finance sections. Team members are trained to support the management of global- and regional-level (Tier 2 and 3) incidents but are available to support any response.
Chevron Corporation's Worldwide Emergency Response Team	An enterprise-level team of Chevron Corporation's most highly trained and experienced personnel capable of filling IMS command and general staff roles of a response organisation, including Deputy IC. Team members are trained to support the management of global-level (Tier 3) incidents but are available to support any response.
Chevron Corporation's Advisory and Resource Team	An enterprise-level initial assessment and support team available to advise during the initial stages of a significant event, assess incident potential, and help the local response team marshal additional resources.

10.3.9.3 Emergency management process

The *Emergency Management OE Process* (Ref. 192) is CAPL's system for emergency management. The process ensures CAPL is prepared to respond immediately and effectively to all emergencies involving contractor- or CAPL-owned or -operated assets as defined in their scope of work.

The *emergency management process* (Ref. 192) comprises these key elements:

- emergency scenarios, including worst case, have been identified; these scenarios are based on the findings from risk assessments of significant safety, health and environmental hazards and other sources (e.g. historical incidents)
- emergency response plans are developed and maintained to address emergency scenarios
- a reliability program is in place for inspection, testing and preventative maintenance of critical emergency response equipment and systems supporting emergency response plans
- an IMS is in place capable of immediately and effectively managing all emergencies
- a training and exercise program, including minimum training and exercise requirements, has been developed to establish and maintain emergency response capability
- crisis management plans have been developed to address a potential crisis or significant event

- business continuity plans have been developed in conformance with the *Business Continuity Planning Corporate OE Process* (Ref. 208).

The OPEP (Ref. 2) acts as an operational document to ensure an appropriate response to the emergency events described in this EP. Smaller spills will be monitored, evaluated, and cleaned up as part of routine duties, where relevant and appropriate to the nature and scale of the spill, and will not require activation of the ORT or OPEP. Several emergency management subprocesses are outlined below that are integral to emergency preparedness and management.

10.3.9.4 Chain of command (emergency response)

A well-delineated EMT chain of command has been established for emergency response (Figure 10-7 to Figure 10-9). As incidents grow or reduce in size or complexity, command may transfer several times. Within the response structure, command may transfer between OC at the tactical level. For a major incident, incident command may transfer to a designated Control Agency or to the Perth EMT, if required.

Although the identity of those filling command positions may change during the incident, the continuity of responsibility and accountability will be maintained. Typically, specialists for particular response options will fulfil Task Leader positions in the ORT where they will be expected to oversee a team or particular response operation.

Throughout an incident, a formal handover will be conducted whenever any command or control position is transferred from one person to another.

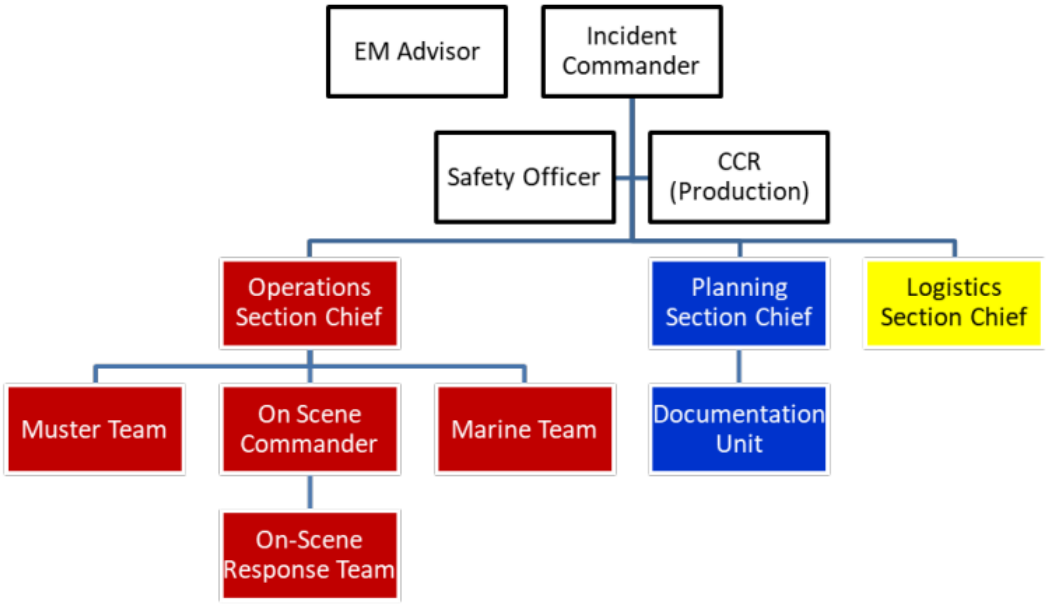


Figure 10-7: Basic installation EMT organisation chart



Figure 10-8: Example expanded EMT organisation chart



Figure 10-9: Example expanded operations section organisation chart

10.3.9.5 Roles and responsibilities (emergency response)

Table 10-12 provides additional information about the structure of these teams and the key individual roles and responsibilities during emergency response. Not all roles presented in Figure 10-7 to Figure 10-9 are described; these are presented as examples only and the final structure of the EMT would be shaped by the specific requirements of the incident. Further information on all Chevron EMT roles are provided in the *Emergency Response Plan* (Ref. 193).

Table 10-12: Key roles and responsibilities — emergency response

Role	Responsibilities
ORT	
On-Scene Commander (OC) (Vessel Master / Person in Charge)	• safely and effectively organises and manages the ORT response operations • keeps the EMT informed regarding the nature and status of the incident and on-site tactical response operations.
Site Safety Officer	• ensures that appropriate actions are taken to protect the safety and health of ORT response personnel.
Task Leader	• safely carries out their assignment consistent with directions received from the OC, branch director, division, or group supervisor.
IEMT	
IEMT IC	• manages the overall emergency response operations and ensures that they are carried out safely, effectively and efficiently • establishes direct line of communications with the OC • mobilises the IEMT and assigns additional support from other response teams (as appropriate to the incident) for Level 2 and 3 incidents that require support beyond the ORT.
OSC	• provides strategic direction and support to the OC and muster and/or shelter area managers • receives information regarding the nature and status of the ORT and provides support for mustering and/or shelter-in-place operations • disseminates information to the IC and other members of the IEMT.
Planning Section Chief	• focuses on the incident's potential using the compilation and display of information regarding the nature and status of an incident and emergency response operations • assists the IEMT IC in defining strategic objectives • assists the IEMT IC in providing information to the PEMT • compiles and retains documentation.
Logistics Section Chief	• obtains personnel, equipment, materials, and supplies needed to mount and sustain emergency response operations • provides services necessary to ensure that emergency response operations are carried out safely and efficiently.

10.3.9.6 Training and competency (emergency response)

Competencies and training requirements for the EMT, ORT, and other personnel during implementation of the OPEP (Ref. 2) are detailed in Appendix G of the OPEP in the *Emergency Management Training and Exercise Procedure* (Ref. 198). Competency and training records for personnel, including contractors and subcontractors, are maintained and available via live Oil Spill Response and Emergency Management readiness dashboards.

Training and course information, including frequency and content, are also described in the *Chevron Emergency Management ABU Training and Exercise Program Procedure* (Ref. 198). Training is delivered via a mix of computer-based training or face-to-face, depending on the particular course, and all EMT positions have minimum training and competency requirements identified.

Oil spill response management training has been designed to align with the knowledge requirements outlined in AEP's *Guidance Document: Incident Management Teams – Knowledge Requirements for Responding to Marine Oil*

Spills (Ref. 199), specifically the general knowledge requirements for all EMT members and the EMT function specific knowledge requirements.

Specific details on the oil spill training packages, including their content and alignment with the AEP guidance, and role specific training requirements are provided in the *Chevron Emergency Management ABU Training and Exercise Program Procedure* (Ref. 198).

10.3.9.7 Oil spill response resourcing and capability

CAPL has multiple EMT resourcing arrangements in place to respond to a potential worst case discharge scenario including internal EMT capacity (inclusive of Source Control), Regional and Global CAPL support teams and functional groups, Oil Spill Response Organisations (OSROs) and industry mutual aid agreements.

Appendix F of the OPEP (Ref. 2) outlines CAPL's EMT Resourcing Assessment Plan for an Oil Spill Incident and evaluates EMT capability requirements. It quantifies and justifies the core and support EMT capability requirements required for a generalised LOWC oil spill scenario (based on 13 weeks) and summarises the assumptions used to develop the EMT capability needs assessment (such as allowances for redundancy, rostering, shift coverage and rotation).

The *PEMT Oil Spill Response Resource Assessment Tool* (Ref. 200) provides a real time assessment of resources available to CAPL to fill the core and support positions identified in the *EMT Resourcing Assessment Plan for an Oil Spill Incident* (Appendix F in the OPEP [Ref. 2]). Using activity- specific worst- case spill scenarios (such as the LOWC scenario described in this EP), the tool can demonstrate that sufficient capability is in place.

The *PEMT Oil Spill Response Resource Assessment Tool* (Ref. 200) quantifies the core and support EMT capability requirements specific to the worst credible scenario described in this EP and demonstrates that at the time of writing, CAPL maintains access to personnel to fill these roles (based on information contained within the *PEMT Oil Spill Response Resource Assessment Tool* [Ref. 200]).

10.3.9.7.1 CAPL Australian resources

CAPL maintains a PEMT with a 24/7 call out roster available to be stood up at any time if required. This includes 13 on-call positions sourced from a pool of trained personnel. The PEMT duty roster enables the formation of the PEMT within two hours of notification. Further information on the PEMT is contained in the *Australian Emergency Response Plan* (Ref. 193).

Current numbers of qualified EMT personnel, including those trained in accordance with the training requirements outlined in the *Chevron Emergency Management Training and Exercise Program Procedure* (Ref. 198), are reflected in the *PEMT Oil Spill Response Resource Assessment Tool* (Ref. 200). In addition, CAPL currently has 'all hazards' personnel, and this capability would be able to be inducted/trained in the oil spill response functions before entering the EMT (as outlined in *Chevron Emergency Management Training and Exercise Program Procedure* [Ref. 198]), as the response transitions from a rapidly evolving reactive response phase to a more proactive, steady-state, project phase response.

10.3.9.7.2 CAPL regional and global teams

As per the *Chevron Corporate Emergency Response Teams and Resources Procedure* (Ref. 209) the Chevron Centre for Emergency Preparedness and Response (CEPR) maintains a global mutual-aid capability, available on a 24/7 basis to quickly and effectively provide enterprise-wide support for major incidents and events. This capability shall include pre-identified, trained, and fit-for-duty response teams capable of filling IMS positions, access to industry owned response cooperatives, and access to internal experts and key external vendors. It includes the following services:

Advisory and Resource Team (ART)

The ART is an initial assessment and support team available to provide advice during the initial stages of an event, to assess incident potential, assist the local response team in marshalling additional resources, and to keep corporate management briefed on the situation or incident. The ART is comprised of a management representative from the impacted operating company, a representative of CEPR, plus a subject matter expert in each of the following areas: public affairs, environmental, safety, and law. The ART team is available via conference call within two hours (or less) of notification, and may also mobilise to the incident site to continue with the assessment and provide assistance to the incident management team.

World-Wide Emergency Response Team (WWERT)

The WWERT is a team of Chevron's most highly trained and experienced personnel capable of filling ICS Command and General Staff roles of a response organisation, including Deputy Incident Commander. WWERT members are trained to support the management of global-level (Tier 3) incidents but are available to support any response. Team members are subject matter experts in emergency management and in developing incident action plans.

Functional Teams (FT)

There are 13 functional response teams with specific technical expertise in selected Command Staff positions (safety officer, legal officer) and unit positions in the planning, logistics and finance sections. FT members are trained to support management of global and regional level (Tier 2 and 3) incidents but are available to support any response.

Regional Response Teams (RRT)

There are two corporate RRTs: Europe/Africa/Middle East and Asia Pacific. The RRTs are regional level (Tier 2) response teams trained to support the initial response (reactive phase) of a significant incident within their respective regions and assist in managing the transition to the ongoing response (proactive phase). The RRTs include personnel capable of filling positions including the Deputy Incident Commander, and Section Chiefs for the Operations, Planning, and Logistics Sections, and specialist to fill the Safety, Documentation, and Public Affairs/Liaison positions.

10.3.9.7.3 Oil spill response organisations

CAPL maintains contractual arrangements with OSROs which include providing technical specialists to supplement the CAPL EMT, as detailed in the OPEP (Ref. 2). Arrangements are maintained with:

AMOSC

CAPL is a participating company in AMOSC. This arrangement provides CAPL with access to the AMOSC personnel and the AMOSC Core-Group under the AMOSPlan.

The AMOSC Core-Group is an Australian industry initiative that was initially crafted in 1992. It is unique within the international context and is noted for being innovative and effective to rapidly expand and surge well trained personnel into a spill response. The AMOSC Core-Group has attended most Australian-based spills and also several offshore spills.

The AMOSC Core-Group averages around 100 personnel at any one time (subject to fluctuations), with expertise split between IMT and field operators.

AMOSC Core Group policy requires all Core-Group personnel to undertake initial training, followed by competency re-validation/training every two years. Typically, AMOSC manage the Core-Group re-validation/training by conducting three one week Core-Group training/workshops per year. AMOSC coordinates the routine testing, monitoring and monthly reporting of Core-Group personnel availability.

Oil Spill Response Limited (OSRL)

CAPL is a participant member with OSRL which guarantees access to Tier 3 technical advice, resources and expertise 365 days per year on a 24-hours a day basis. OSRL have capacity to mobilise additional equipment and personnel to CAPL EMT from their global bases. Anyone within the CAPL PEMT can notify OSRL of an incident, however, only the nominated CAPL personnel may request the assistance of OSRL using the Mobilisation Form, as per the Service Level Agreement.

The OSRL Service Level Agreement provide for:

- 24/7 call-out arrangements
- guaranteed initial response from OSRL of five technical support personnel (EMT or field personnel) for five days
- surge to guaranteed 18 OSRL personnel, upon request from the CAPL EMT
- depending on size/complexity, OSRL maintain 80 response team personnel globally, who are potentially able to be provided to support an ongoing Level 3 event, on a best-endeavours basis.

OSRL service level statement defines the types of services provided by the 18-persons surge capability as:

- technical advice and incident management coaching within the command centre
- developing an Incident Management Plan
- tier 1/2 equipment readiness and contractor training
- in-country logistics planning and support for inbound equipment
- impact assessment and advice on response strategy selection
- shoreline cleanup and assessment technique and aerial surveillance / quantification surveys
- tactical response planning.

10.3.9.7.4 Industrial mutual aid arrangements

AEP MoU framework

As a member company, CAPL would seek to engage the services of Perth-based specialist personnel (as required) from other Petroleum Titleholders under the MoU (Ref. 201). The MOU agreement documents the commitment to share rigs, equipment, and service personnel in the event of a major loss of containment incident, significantly increasing the resources available to a titleholder company.

OSRL Mutual Aid Framework Agreement—SWIS

As a member company, CAPL has access to and can request support from other SWIS members under the OSRL Mutual Aid provisions for source control specialist support. This includes support from any of the SWIS member companies around the world that are signed on to the mutual aid agreement with OSRL SWIS.

10.3.9.7.5 Well control specialists

CAPL Global Source Control

The Global Source Control roster provides CAPL names, locations and positions to allow the CAPL IMT to mobilise individuals to the Source Control branch for response support.

Third Party Technical Specialists

As per the SCERP (Ref. 196), CAPL has service agreements or memberships with several third-party technical specialists and contractors, who are available to support a response to a loss of containment incident. Activation of these resources occurs upon authorisation from the CAPL IMT or its delegate.

10.3.9.8 Oil spill exercise schedule

The *CAPL Emergency Management 5 Year Training and Exercise Schedule* (Ref. 210) describes the schedule of training and exercise required for all emergency events. The training and exercise program incorporates CAPL's oil spill exercise schedule for oil spill training, drills, and exercises, including OWR and OSM-BIP implementation. As CAPL'S response arrangements are common among its assets, and resource capabilities are shared, the testing and exercise schedule has been developed to test the various response options. The focus changes for each exercise to ensure any unique aspects of that location (e.g. resources at risk, first-strike equipment) are tested.

The objective is to test and maintain the capability to respond to emergency events. The exercises aim to test:

- notification, activation, and mobilisation of the ORT and EMT
- efficiency and effectiveness of equipment deployment
- efficiency and effectiveness of communication systems.

The testing schedule is a live document that is subject to change. The *5 year training and exercise schedule* (Ref. 210) outlines the proposed testing arrangements to be completed, including the exercise types (Table 10-13) and proposed level of response to be tested (Table 10-14) that may be used to meet the defined objectives. A minimum of one test for each level will be conducted each year.

Table 10-13: Exercise types

Type	Details
Notification exercise	• tests the procedures to notify and activate the EMTs, support organisations, and regulators.
Tabletop exercise	• normally involves interactive discussions of a simulated scenario among members of an EMT; personnel or equipment are not mobilised.
Drill	• conducts field activities such as equipment deployment, shoreline assessment, monitoring etc.
Functional exercise	• activates at least one EMT to establish command, control, and coordination of a serious emergency event • often more complex as it simulates several different aspects of an oil spill incident and may involve third parties.

Table 10-14: Exercise levels

Level	Details
Level 1 – ORT	• may be held in conjunction with a Level 2 EMT exercise • designed to evaluate the ability of ORTs to implement CAPL's Emergency Management System as it applies to ORTs • ORTs are encouraged to conduct as many exercises as they want each year that do not include the ERT or a Level 2 EMT.
Level 2 – EMT	• exercises may include the participation of an ORT and may be held in conjunction with a Level 3 EMT exercise • usual duration – one to two hours • designed to evaluate a Level 2 EMT's ability to notify and activate team members, set up a Level 2 EMT emergency command centre, and implement CAPL's Emergency Management System as it applies to Level 2 EMTs.
Level 3 – EMT	• each exercise may include the participation of a Level 2 EMT and/or ORT • usual duration – three to six hours • designed to evaluate the EMT's ability to notify and activate team members, transfer command to a Level 3 EMT Emergency Command Centre and implement the CAPL's Emergency Management System as it applies to incident escalation.
Oiled Wildlife	• exercises may include the participation of an ORT and may be held in conjunction with a Level 2 or 3 EMT exercise • usual duration – three to six hours • designed to evaluate the Oiled Wildlife Branch's ability to notify and activate OWR teams and implement a response in line with CAPL and DBCA oiled wildlife plans and manuals.
OSM-BIP	• exercises may be held in conjunction with a Level 2 or 3 EMT exercise, or conducted as a standalone exercise • usual duration – three to six hours • designed to evaluate the EMT's ability to notify and activate OSM-BIP team members and external service providers and test the arrangements and capability in place for operational and scientific monitoring.

The training and exercise program outlines the process for evaluating training, drills, and exercises against defined objectives, and incorporating lessons learned. An after-action report is generated for all Level 2 (and above) exercises, which is used during spill exercises to assess the effectiveness of the exercise against its objectives and to record recommendations. Relevant actions are then assigned to the responsible party where they are tracked to completion using internal

processes. Exercise planners will be required to refer to previous recommendations for continual review and improvement.

Response arrangements as detailed in the OPEP (Ref. 2) must be tested:

- when they are introduced
- when they are significantly amended
- not later than 12 months after the most recent test
- if a new location for the activity is added to this EP after the response arrangements have been tested, and before the next test is conducted: test the response arrangements in relation to the new location as soon as practicable after it is added to this EP.

10.3.9.8.1 Source control training and exercises

In addition to the training and exercise schedule outlined in the *CAPL Emergency Management 5 Year Training and Exercise Schedule* (Ref. 210), source control exercises specific to the credible worst-case LOWC event described in this EP are also carried out in accordance with the SCERP (Ref. 196).

There are two exercise styles (Table 10-15) that will be utilised to exercise and test components outlined in the SCERP.

Source control exercises are conducted on periodic basis that prepares the source control branch for well activity in the region.

Table 10-15: Source control exercise types

Type	Details
Discussion exercise	• discussion exercise (DISCEX) in the form of a workshop or seminar • a DISCEX will be conducted prior to commencement of drilling campaign, during which the CAPL PEMT and global source control branch can provide an overview of the SCERP components and source control tactics that may be employed in the unlikely event of a LOWC. • Chevron's global source control branch resources that would likely be involved in the PEMT may also receive the familiarisation/information session.
Functional exercies	• functional exercise in the form of a scenario-based simulation (no actual deployment of equipment • a functional exercise will be conducted on a periodic basis incorporating elements of the CAPL PEMT Command and General Staff, global source control branch resources and selected support specialist contractors • this exercise may be incorporated into an oil spill response exercise.

The source control exercises are designed to:

- practice activation and mobilisation of Global Source Control Branch
- validate successful interface of Global Source Control Branch resources with Perth IMT Source Control Branch
- practice developing Source Control Branch strategies and tactics to meet objectives
- validate vessel tracking software utilised to identify vessels with ROV support for site survey, debris clearance, BOP intervention and SSDI

- validate capping stack transport and deployment vessel utilising vessel tracking software
- validate AMOSC subsea first-response toolkit, OSRL subsea incident response tool kit or OSRL dispersant delivery system transport timings from AMOSC and OSRL to facilitate SSDI operations
- validate OSRL water column monitoring equipment transport timings into Australia
- validation of OSRL capping stack and ancillary equipment activation process.

Exercise evaluation will be undertaken by selected exercise evaluators drawn both internally within Chevron and externally by specialist incident management /source control training providers. Any actions from exercises are tracked and closed out via the CAPL action tracker and lessons learnt incorporated into subsequent tests. Where required, response documentation shall be updated to incorporate learnings derived during response testing.

10.4 Adaptive management framework for pygmy blue whales

An adaptive management framework has been applied to ensure the control measures identified and implemented during the petroleum activity are effective in managing the potential risks of underwater sound emissions on pygmy blue whales such that they are not inconsistent with the Conservation Management Plan for the Blue Whale (Ref. 52).

Control measure **CM-19** has been developed for MODU/vessels that are transiting or on standby within the OA, and the caution zones have been defined using the results of animat modelling (see Section 8.6). Table 10-16 describes the caution zones for respective vessel types.

Control measures **CM-20a and CM-20b** have been developed for when the MODU/vessels need to use DP to hold station (see Section 8.6) and requires the use of a Pre Start-up Observation Period. For **CM-20a and CM-20b**, Figure 10-10 shows the process followed by bridge-watch on the MODU/vessel and Table 10-16 describes the relevant Potential Behavioural Effect Zones. The size of the Potential Behavioural Effect Zones are based on the results of animat modelling presented in Section 8.6.

In the event that new and/or additional data becomes available (e.g. MODU/vessel source levels and/or received levels in-field), these control measures and associated zones may be reviewed and revised in accordance with the MoC process (Section 10.3.2.2).

Table 10-16: Caution zones and potential behaviour effect zones based on vessel and activity type

Vessel and activity	Caution zone[143]	Potential Behavioural Effect Zone
Transiting or on standby within OA		
MODU	1.45 km	–

[143] The visible distance to the horizon varies based on observer height and weather conditions. If the defined caution zone/potential behavioural effect zone distances are not visible, then observations are to extend to the field-of-view of the bridge-watch.

Vessel and activity	Caution zone[143]	Potential Behavioural Effect Zone
Vessels[144] (e.g. PSV, MSV, IMR)	0.54 km	–
Station holding on DP within OA		
MODU	–	1.45 km
PSV alongside MODU (e.g. for resupply)	–	1.45 km
Vessels[144] (e.g. PSV, MSV, IMR)	–	0.54 km

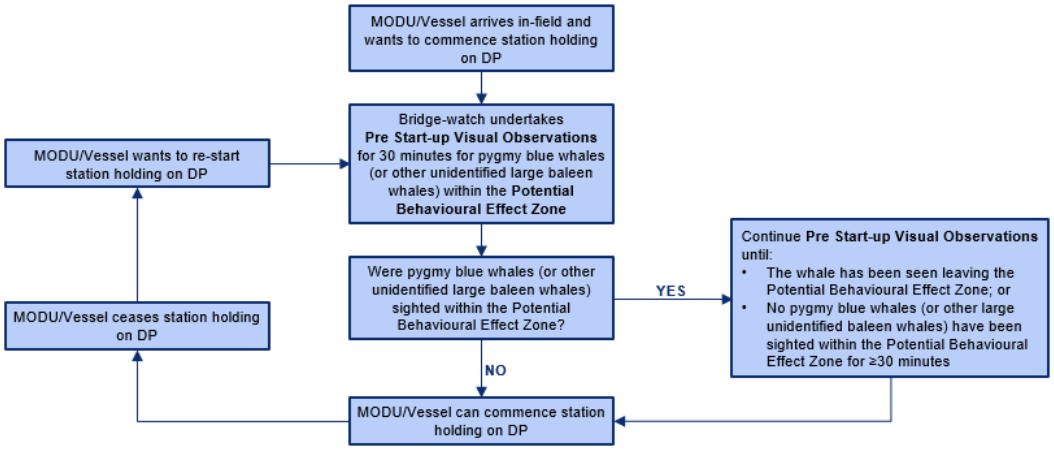


Figure 10-10: Pre start-up visual observations action flow chart for commencing station holding on DP

10.5 Management framework for acoustic (SBP) surveys

Control measures **CM-22a and CM-22b** have been developed for when a vessel needs to undertake a survey using SBP equipment (see Section 8.7) and requires the use of a Pre Start-up Observation Period. For **CM-22a and CM-22b**, Figure 10-11 shows the process followed by bridge-watch on the vessel and the relevant Potential Behavioural Effect Zone is defined as 280 m. This distance is based on the largest predicted radius from spherical modelling of various types of SBP.

In the event that new and/or additional data becomes available (e.g. SBP source levels), these control measures may be reviewed and revised in accordance with the MoC process (Section 10.3.2.2).

[144] The source levels used for acoustic and animat modelling are shown in Table 8-23. While the animat modelling of a single vessel was based on the IMR vessel (Scenario 5), the source level for this and the MSV are similar and therefore similar modelled distances would be expected. The source level of the IMR vessel is higher in comparison to the PSV and would therefore be a conservative representation of caution zone/predicted behavioural effect zone for these vessel types.

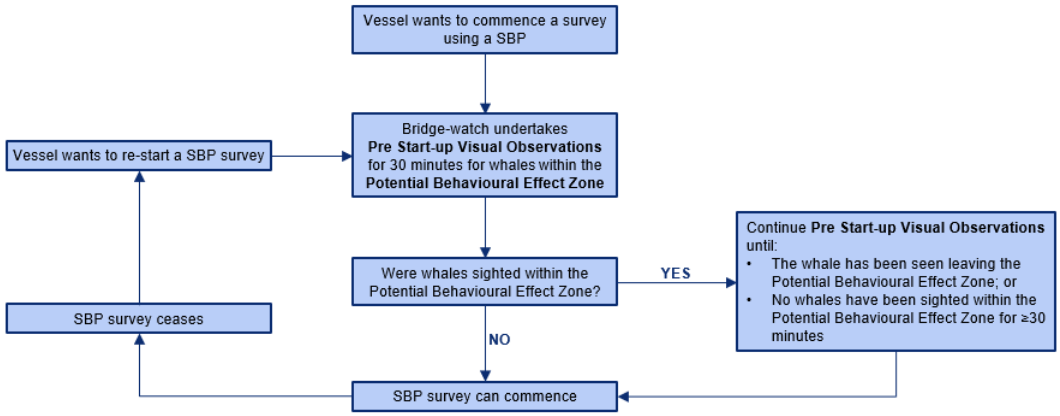


Figure 10-11: Pre start-up visual observations action flow chart for commencing SBP surveys

10.6 Environmental monitoring and reporting

10.6.1 Environmental monitoring

Regulation 22(6) of OPGGS(E)R requires that the implementation strategy provides for sufficient monitoring of, and maintaining a quantitative record of, emissions and discharges such that this record can be used to assess whether the EPOs and EPSs in the EP are being met.

CAPL and vessel contractors will monitor and record emissions and discharges as detailed in Section 8 to ensure that this record can be used to assess whether the EPOs and EPSs in this EP are being met. If an emergency condition resulting in a Level 2 or 3 spill event occurs, CAPL will implement the OSM-BIP (Ref. 5), which is identified as a control measure in Sections 8.15, 8.16, 9.5, 8.18 and 8.19. The OSM-BIP describes a program of monitoring, and is the principal tool for determining the extent, severity, and persistence of environmental impacts from an emergency condition and the emergency response activities to be undertaken by CAPL.

10.6.2 Incident reporting

Environmental incidents will be reported by CAPL in accordance with Table 10-17.

Table 10-17: Incident reporting

Recordable Incident reporting – regulation 50	
Under the OPGGS(E)R a *"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 environmental performance standard relating to the activity, that is not a reportable incident"* Therefore, recordable incidents are breaches of the EPOs and EPSs described in Section 8.	
Reporting requirements	**Report to / Timing**
Written report that must include: • a record of all recordable incidents that occurred during the calendar month • all material facts and circumstances concerning the recordable incidents • any actions taken to avoid or mitigate any adverse environmental impacts • any corrective actions already taken, or proposed to be taken, to stop, control or remedy	Submit written report to NOPSEMA by no later than the 15th of each month. As identified in NOPSEMA's Guidance note: Notification, Reporting and Recording Requirements for Incidents (Ref. 211) if no recordable incidents have occurred during any particular month, a recordable incident report is not required.

the incident and to prevent a repeat of similar incidents.	

Reportable Incident reporting – regulations 47, 48, 49

Under the OPGGS(E)R a "*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*."

In alignment with *Chevron Corporation's Integrated Risk Priorization Matrix* (Table 6-2) 'reportable incidents' under this EP include those unplanned events (not planned activities) that have been risk assessed within Section 8 as having a consequence level of Moderate (4) or greater. In accordance with this definition, the reportable incidents identified under this EP are:

- introduction of an IMP (Section 8.12)
- unplanned release from a vessel collision event (Section 8.15)
- unplanned release from a LOWC (Section 8.16).

Incident reporting is assessed on a case-by-case basis to determine if they trigger a reportable incident as defined by the OPGGS(E)R and this EP. Other incidents that may be considered reportable incidents include:

- death or injury to individual(s) from an EPBC Act listed species
- an unplanned event within a Commonwealth Marine Park.

Reporting requirements	Report to
Verbal notification that must include: • all material facts and circumstances concerning the reportable incident known at the time • any actions taken to avoid or mitigate any adverse environmental impacts • any corrective actions already taken, or is proposed to be taken, to stop, control or remedy the reportable incident..	Report verbally to NOPSEMA as soon as practicable and no later than two hours after the first occurrence of the incident or the time the titleholder becomes aware of the reportable incident. Phone:1300-674-472 or Or alternatively: +61 8 6188 8990
Written record of the notification containing the same details as the verbal notification. The titleholder is not required to include in the record anything that was not included in the notification.	As soon as practicable after verbal notification, a written notification must be provided to: • NOPSEMA: submissions@nopsema.gov.au. • NOPTA: info@nopta.gov.au • WA DMPE: petroleum.environment@dmpe.wa.gov.au
A written report must include: • all material facts and circumstances concerning the reportable incident • any actions taken to avoid or mitigate any adverse environmental impacts • any corrective actions already taken, or that may be taken, to stop, control or remedy the reportable incident • any corrective actions already taken, or that may be taken, to prevent a recurrence of similar incidents.	Written report to be provided to NOPSEMA as soon as practicable and not later than three days following the incident: • NOPSEMA: submissions@nopsema.gov.au Within seven days of providing a written report of a reportable incident to NOPSEMA, the titleholder must also provide a copy of the report to: • NOPTA: info@nopta.gov.au • WA DMPE: petroleum.environment@dmpe.wa.gov.au.

Additional reporting requirements

Reporting requirements	Report to
An unplanned event (such as an oil spill) which occurs within, or is likely to affect any AMP. The notification should include: • titleholder details	Report verbally to the DNP (24-hour) Marine Compliance Duty Officer as soon as practicable, and also provide a follow-up email. Phone: 0419 293 465

• time and location of the incident • proposed response arrangements and locations as per the OPEP (e.g. dispersant, containment, etc.) • contact details for the response.	Email: marine.compliance@environment.gov.au.
Death or injury to individual(s) from an EPBC Act Listed Species as a result of the petroleum activity.	Report injury to or mortality of EPBC Act Listed Threatened or Migratory species within seven business days of observation to DCCEEW or equivalent: • Phone: +61 2 6274 1111 • Email: EPBC.Permits@environment.gov.au.
Vessel collision with marine mammals (whales).	Report as soon as practicable: • https://data.marinemammals.gov.au/
Presence of any suspected IMP or disease within 24 hours.	DPIRD: • FishWatch 24-hour hotline: 1800 815 507 • Email: biosecurity@fish.wa.gov.au.
Unplanned release that is likely to impact land or water within Western Australian State jurisdiction.	Reported as soon as practicable: petroleum.environment@dmirs.wa.gov.au. Report verbally to the DoT MEER Duty Officer within two hours, and also provide a follow-up email with a POLREP attached. Phone: 08 948 9924 Email: Report verbally to the DNP (24-hour) Marine Compliance Duty Officer as soon as practicable, and also provide a follow-up email. Phone: 0419 293 465 Email: marine.compliance@environment.gov.au.
A marine incident involving: • collision of a vessel with another vessel or with an object • equipment failure that may affect vessel's ability to prevent pollution from occurring • failure in operation of a component of material handling equipment (e.g. dropped equipment).	Notify AMSA as soon as reasonably possible: • complete and submit the online form 18 • complete and email form 18 to reports@amsa.gov.au Submit to AMSA an incident report form 19 within 72 hours of becoming aware of the incident.

10.6.3 Routine environmental reporting

Regulation 51 of the OPGGS(E)R requires environmental performance reporting for the activity described in this EP, as summarised in Table 10-18. Routine notifications required by regulation 54 of the OPGGS(E)R, and additional notifications as required by other legislation or guidelines, are also included in Table 10-18.

Table 10-18: Routine external reporting or notification requirements

Reporting requirement	Description	Reporting to	Timing
Environmental performance reporting – regulation 51			
Environmental performance reporting	A report detailing environmental performance of the	NOPSEMA submissions@nopsema.gov.au	Annually from the date of EP

Reporting requirement	Description	Reporting to	Timing
	petroleum activity detailed in this EP. As per regulation 22(7) the interval between reports must not be more than 12 months.	Phone: +1300-674-472.	acceptance (Ref. 211).
Notification of start and end of activity – regulation 54			
Notification of start of activity	CAPL must complete Form FM1405 and submit to NOPSEMA at least 10 days before activity commencement.	NOPSEMA submissions@nopsema.gov.au or: https://securefile.nopsema.gov.au/filedrop/submissions.	Once prior to activity commencement
Notification of conclusion of activity	CAPL must complete Form FM1405 and submit to NOPSEMA within 10 days of activity completion.	NOPSEMA submissions@nopsema.gov.au or: https://securefile.nopsema.gov.au/filedrop/submissions.	Once following completion of activity.
Additional notification requirements			
Notification of start of activity	CAPL will provide DMPE a pre-start notification confirming the start date of the proposed activity.	DMPE: petroleum.environment@dmpe.wa.gov.au.	Once prior to activity commencement
Notification of conclusion of activity	CAPL must notify DMPE following completion of the activity.	DMPE: petroleum.environment@dmpe.wa.gov.au.	Once following completion of activity.
Discovery of certain UCH	In accordance with section 40 of the UCH Act, CAPL must provide written notification setting out: • a description of the article • a description of the place where the article is situated that is sufficient to enable the article to be located.	Electronic form available via the Australasian Underwater Cultural Heritage Database: http://www.environment.gov.au/shipwreck/public/forms/notification.do;jsessionid=08546DC0F8BB76EEA72FCE054D9139F1?mode=add.	Within 21 days of the discovery.

10.7 Environment plan review

If required, any revisions and/or resubmission of this EP to NOPSEMA, in accordance with Division 5 of the OPGGS(E)R, will be undertaken in accordance with the OEMS, and particularly the MoC process (Section 10.3.2.2).

11 Acronyms and abbreviations

Table 11-1 defines the acronyms and abbreviations used in this document.

Table 11-1: Acronyms and abbreviations

Acronym / Abbreviation	Definition
ABU	Australian Business Unit
ACCU	Australian carbon credit unit
ACMA	Australian Communications and Media Authority
AHO	Australian Hydrographic Office
AIMS	Australian Institute of Marine Science
AINJ	Auditory injury
AIS	Automatic identification system
ALARP	As low as reasonably practicable
AMP	Australian Marine Park
AMSA	Australian Maritime Safety Authority
AMSIS	Australian Marine Spatial Information System
ANZG	Australian and New Zealand Guidelines
API	American Petroleum Institute
AR6	Sixth Assessment Report
AR7	Seventh Assessment Report
AUV	Autonomous underwater vehicle
BCH	Benthic communities and habitats
BIA	Biologically Important Area
BU	Business Unit
BOP	Blowout preventor
BTAC	Buurabalayji Thalanyji Aboriginal Corporation
BTEX	Benzene, toluene, ethylbenzene and xylenes
CALM Act	*Conservation and Land Management Act 1984* (WA)
CAPL	Chevron Australia Pty Ltd
CER	Clean Energy Regulator
CII	Carbon Intensity Indicator
CO	Carbon monoxide
CO_2	Carbon dioxide
COEM	Contractor Operational Excellence Management
COLREGS	International Regulations for Preventing Collisions at Sea
CoW	Control of Work
CSV	Construction support vessel
Cth	Commonwealth
DC	Drilling centre

Acronym / Abbreviation	Definition
DCCEEW	Department of Climate Change, Energy, Environment and Water
DE	Diatomaceous earth
DGV	Default guideline values
DP	Dynamically positioning
DPIRD	Department of Primary Industries and Regional Development
EEDI	Energy Efficiency Design Index
EEXI	Energy Efficiency Existing Ship Index
EEZ	Exclusive economic zone
EIAPP	Engine International Air Pollution Prevention
EMBA	Environment that may be affected
EP	Environment plan
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
EOFL	End of facility life
EPO	Environmental performance outcome
EPS	Environmental performance standard
ER	Exposure ranges
ESD	Ecologically sustainable development
FCS	Field control station
G&E	Geryon and Eurytion
GFP	Gorgon Foundation Project
GHG	Greenhouse gas emissions
GS3	Gorgon Stage 3
GTP	Gas Treatment Plant
GWL	Global warming levels
HCTS	Habitat critical to survival
HMEAT	Hazardous Material Environment Assessment Tool
HVSC	High voltage submarine cable
HWM	High-water mark
HXT	Horizontal subsea tree
H-WA	Hawksbill turtle WA
IAPP	International Air Pollution Prevention
IChEMS	Industrial Chemicals Environmental Management Standard
IEE	International Energy Efficiency
II&R	Incident investigation and reporting
IMCRA	Integrated Marine and Coastal Regionalisation of Australia
IMO	International Maritime Organization
IMR	Inspection, maintenance, and repair
IMS	Incident management system

Acronym / Abbreviation	Definition
IPCC	Intergovernmental Panel on Climate Change
ISQG	Interim sediment quality guideline
IUCN	International Union for Conservation of Nature
J-IC	Jansz-Io Compression
JASCO	JASCO Applied Sciences
JASMINE	JASCO Animal Simulation Model Including Noise Exposure
JRCC	Joint Rescue Coordination Centre
KEF	Key ecological feature
LBL	Long baseline
LGM	Last glacial maximum
LNG	Liquefied natural gas
LoR	Limits of reporting
LOWC	Loss of well control
LWI	Light well intervention
LWM	Low-water mark
MARPOL	International Convention for the Prevention of Pollution from Ships
MBES	Multibeam echo sounder
MC	Measurement criteria
MCH	Mardathoonera Cultural Heritage Pty Ltd
MDO	Marine diesel oil
MEG	Monoethylene glycol
MFO	Marine Fauna Observer
MNES	Matters of national environmental significance
MoC	Management of change
MODU	Mobile offshore drilling unit
MoU	Memorandum of Understanding
MSS	Marine Seismic Survey
MSV	Multi-purpose support vessel
NADF	non-aqueous drill fluid
NEPM	National Environment Protection Measure
NDC	Nationally determined contribution
NGER Act	*National Greenhouse and Energy Reporting Act 2007*
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOPSEMA	National Offshore Petroleum Safety and Environment Management Authority
NOPTA	National Offshore Petroleum Titles Administrator
N	Nitrogen
NO_2	Nitrogen dioxide

Acronym / Abbreviation	Definition
NTGAC	Nganhurra Thanardi Garrbu Aboriginal Corporation
NWMR	North-west Marine Region
NWS	North West Shelf
NWSTF	North West Slope Trawl Fishery
OA	Operational area
OE	Operational Excellence
OEMS	Operational Excellence Management System
OFOV FME	Orientation field-of-view full moon equivalents
OHGP	Open hole gravel pack
OPEP	Oil Pollution Emergency Plan
OPGGS Act	*Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth)
OPGGS(E)R	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (Cth)
OPGGS(RMA)R	Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2025 (Cth)
OPP	Offshore project proposal
ORT	On-site Response Team
OSM-BIP	Operational and Scientific Monitoring Bridging Implementation Plan
OVIS	Offshore Vessel Information System
O_3	Ozone
PAH	Polycyclic aromatic hydrocarbons
PAR	Pre-arrival reporting
PBC	Prescribed Bodies Corporates
PEMT	Perth Emergency Management Team
PK	Peak pressure levels
PK-PK	Peak-peak pressure level
PLV	Pipelay vessel
PMST	Protected Matters Search Tool
PM_{10}	Particulate matter 10 micrometers or less in diameter
POB	Persons on board
PSV	Platform supply vessel
PTS	Permanent threshold shift
RFSU	Ready for start-up
ROV	Remotely operated vehicle
Safeguard Rule	National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Cth)
SBP	Sub-bottom profiler
SBTF	Southern Bluefin Tuna Fishery
SCE	Solids control equipment

Acronym / Abbreviation	Definition
SCERP	Source control emergency response plan
SCSSV	Surface control subsurface safety valve
SCSt	Subsea compression station
SEEMP	Ship Energy Efficiency Management Plan
SEL	Sound exposure level
SIMOPS	Simultaneous operations
SLA	Safe lift area
SMC	Safeguard Mechanism credit
SNA	Safety navigation area
SOLAS	Safety of life at sea
SOP	Standard operating procedures
SO_2	Sulfur dioxide
SPL	Sound pressure level
SSS	Side scan sonar
TBT	Tributyltin
TDS	Total dissolved solids
TEC	Threatened ecological communities
TN	Total nitrogen
TP	Total phosphorus
TPH	Total petroleum hydrocarbons
TRH	Total recoverable hydrocarbons
TTS	Temporary threshold shift
UCH	Underwater Cultural Heritage
UCH Act	*Underwater Cultural Heritage Act 2018* (Cth)
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USBL	Ultra-short baseline
UV	Ultraviolet
WA	Western Australia
WAC	Wirrawandi Aboriginal Corporation
WBFs	Water-based fluids
WBRDIF	Water-based reservoir drill-in fluid
WOMP	Well Operations Management Plan
WTBF	Western Tuna and Billfish Fishery
YAC	Yinggarda Aboriginal Corporation

12 References

The following documentation is either directly referenced in this document or is a recommended source of background information.

Table 12-1: References

Ref No	Description	Document ID
1.	NOPSEMA. 2024. *Form: Environment Plan Summary Statement*. National Offshore Petroleum Safety and Environmental Management Authority, Perth, Western Australia. Available from: https://www.nopsema.gov.au/document-hub/forms-and-templates [Accessed: June 2025].	N-04750-FM1848 A662605
2.	Chevron Australia. 2026. *Chevron Australia - Consolidated Oil Pollution Emergency Plan (OPEP)*. Chevron Australia, Perth, Western Australia	ABU-COP-02788
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528.	Nocterra. 2026. *Technical Report Gorgon Stage 3 Pipelay and Subsea Installation- Artificial Light Modelling Rev. 0.* Nocterra. Unpublished report for Chevron Australia, Perth, Western Australia	GS3-US00-RGL-RPT-CVX-000-00002-00

Appendix A Operational Excellence—Policy 530

policy 530

operational excellence: achieving world-class performance

It is the policy of Chevron Corporation to protect the safety and health of people and the environment, and to conduct our operations reliably and efficiently. The Operational Excellence Management System (OEMS) is the way Chevron systematically manages workforce safety and health, process safety, reliability and integrity, environment, efficiency, security, and stakeholder engagement and issues. OEMS puts into action our Chevron Way value of Protecting People and the Environment, which places the highest priority on the safety and health of our workforce and the protection of communities, the environment and our assets. Compliance with the law is a foundation for the OEMS.

Our OEMS is a risk-based system used to understand and mitigate risks and maintain and assure safeguards. OEMS consists of three parts:

leadership and OE culture

Leadership is the largest single factor for success in OE. Leaders are accountable not only for achieving results, but achieving them in the right way. Leaders must demonstrate consistent and rigorous application of OE to drive performance and meet OE objectives.

focus areas and OE expectations

Chevron manages risks to our employees, contractors, the communities where we operate, the environment and our assets through focus areas and OE expectations that guide the design, management and assurance of safeguards.

management system cycle

Chevron takes a systematic approach to set and align objectives; identify, prioritize and close gaps; strengthen safeguards and improve OE results.

We will assess and take steps to manage OE risks within the following framework of focus areas and OE expectations:

Workforce Safety and Health: We provide a safe and healthy workplace for our employees and contractors. Our highest priorities are to eliminate fatalities and prevent serious injuries and illnesses.

Process Safety, Reliability and Integrity: We manage the integrity of operating systems through design principles and engineering and operating practices to prevent and mitigate process safety incidents. We execute reliability programs so that equipment, components and systems perform their required functions across the full asset lifecycle.

Environment: We protect the environment through responsible design, development, operations and asset retirement.

Efficiency: We use energy and resources efficiently to continually improve and drive value.

Security: We protect personnel, facilities, information, systems, business operations and our reputation. We proactively identify security risks, develop personnel and sustainable programs to mitigate those risks, and continually evaluate the effectiveness of these efforts.

Stakeholders: We engage stakeholders to foster trust, build relationships, and promote two-way dialogue to manage potential impacts and create business opportunities. We work with our stakeholders in a socially responsible and ethical manner, consistent with our respect for human rights, to create a safer, more inclusive business environment. We also work with our partners to responsibly manage Chevron's non-operated joint venture partnerships and third-party aviation and marine activities.

There are specific OE expectations which need to be met under each focus area. Additional expectations apply to all focus areas and address legal, regulatory and OE compliance; risk management; assurance; competency; learning; human performance; technology; product stewardship; contractor OE management; incident investigation and reporting; and emergency management.

Through disciplined application of the OEMS, we integrate OE processes, standards, procedures and behaviours into our daily operations. While leaders are responsible for managing the OEMS and enabling OE performance, every individual in Chevron's workforce is accountable for complying with the principles of 'Do it safely or not at all' and 'There is always time to do it right'.

Line management has the primary responsibility for complying with this policy and applicable legal requirements within their respective functions and authority limits. Line management will communicate this policy to their respective employees and will establish policies, processes, programs and standards consistent with expectations of the OEMS.

Employees are responsible for understanding the risks that they manage and the safeguards that need to be in place to mitigate those risks. Employees are responsible for taking action consistent with all Company policies, and laws applicable to their assigned duties and responsibilities. Accordingly, employees who are unsure of the legal or regulatory implications of their actions are responsible for seeking management or supervisory guidance.



Balaji Krishnamurthy
President – Australia

the human energy company®

Appendix B Concordance with the Gorgon Backfill Fields Development Offshore Project Proposal

As described in Section 2, the petroleum activity covered by this EP forms part of the offshore project described in the NOPSEMA accepted *Gorgon Gas Development: Backfill Fields Offshore Project Proposal (*Ref. 3). The Gorgon Backfill Fields Development OPP defines the scope of the Development and associated activities at the concept stage. It includes a comprehensive assessment of anticipated environmental impacts and risks and establishes an overarching framework for environmental management and performance in relation to those impacts and risks.

As the OPP is developed during the early phase project development, further refinement of activity descriptions and associated environmental impacts and risks is expected to occur through subsequent Environment Plans as technical definition progresses, while remaining within the scope of the offshore project and the impact and risk profile assessed in the accepted OPP (Ref. 18).

Concordance Table B-1 details how the activities described in this EP are covered within the scope of the Gorgon Backfill Fields Development OPP.

The Gorgon Backfill Fields Development OPP defined suitable high-level EPOs for the Development. These EPOs have been cascaded to the relevant project activities covered under this EP. Table B-2 compares the EPOs described in the Gorgon Backfill Fields Development OPP with those proposed in this EP and documents any modifications. While some EPOs have been adjusted to reflect the scope of the petroleum activity covered by this EP, the EPOs, EPS and controls defined in this EP are consistent with the intent of the EPOs in the in the OPP and will deliver an equivalent, or improved, level of environmental performance compared to that described in the Gorgon Backfill Fields Development OPP for the activities and aspects within the scope of this EP.

Demonstration that the petroleum activity is part of an offshore project described within an accepted OPP.

Table B-1: Concordance table between the OPP's activities and those included in this EP

Component	Backfill Fields Development OPP	G&E drilling EP (this EP)
Location	The scope of the Backfill Fields Development OPP covered the development of seven gas fields (Chandon, Chrysaor, Dionysus, Eurytion, Geryon, Semele and West Tryal Rocks) located in Commonwealth waters off the north-west coast of WA; refer to Sections 1.1 and 4.1.2 of the OPP (Ref. 3).	The scope of the G&E drilling and completion EP (this EP) is associated with the Geryon and Eurytion gas fields; refer to Sections 2 and 4 of this EP. These gas fields and locations are within the scope of the accepted OPP.
	The 'Development Area' was defined as the area within which all petroleum activities associated with the Backfill Field Development would occur; refer to Section 4.1.3 and Figure 4-2 of the OPP (Ref. 3).	The Operational Area is the area within which the petroleum activity covered by this EP will be undertaken; refer to Section 4.1.1 and Figure 4-1of this EP. The Operational Area is within the spatial extent of the Development Area within the accepted OPP.
Timing	Section 4.1.4 of the OPP (Ref. 3) states that the earliest that G&E is likely to be ready for activities to commence in the DA is late-2026.	This petroleum activity is indicatively scheduled to commence from early-2027. The timing outlined in this EP is within scope of the accepted OPP.

Component	Backfill Fields Development OPP	G&E drilling EP (this EP)
Activity	Section 4.3.2 of the OPP (Ref. 3) describes drilling activities that may be undertaken to support the Backfill Fields Development.	The activities covered by this EP include drilling, completions; refer to Section 4 of this EP. These activities are within the scope of activities covered by the accepted OPP.
	Section 4.2.2 of the OPP (Ref. 3) indicates that the G&E field will have a maximum of eight wells, with each well taking ~3 months to drill.	The wells identified in this EP are within the limit set by the accepted OPP.
Environment that may be affected	The environment that may be affected (EMBA) by the Development has been defined as an area where a change to environmental receptors may potentially occur as a result planned activities or unplanned events associated to the Gorgon Backfill Fields Development OPP; refer to Section 6.1 and Figures 6-1 and 6-2 of the OPP (Ref. 3).	The Hydrocarbon EMBA identified in this EP is within the limits identified in the Gorgon Backfill Fields Development OPP.

Table B-2: Concordance table between the OPP's EPOs and those included in this EP.

Gorgon Backfill Fields OPP EPO	EPO/ EPS in EP/ Application in EP	Refinement and/or modifications in this EP
Physical presence—vessels, infrastructure and/or equipment		
EPO-33: No interference with other lawful marine users from planned activities associated with the Development to a greater extent than is necessary for the reasonable exercise of the rights and performance of duties.	EPO-33: No interference with other lawful marine users from planned activities associated with the petroleum activity to a greater extent than is necessary for the reasonable exercise of the rights and performance of duties.	Modified to refer to the petroleum activity instead of the entire Development.
Physical presence—seabed disturbance		
EPO-01: Planned seabed disturbance within the Development Area will not cause lasting changes to water quality (total suspended solids). Water quality will return to ambient state within seven days following the cessation of the disturbance.	EPO-01: Planned seabed disturbance within the OA will not cause lasting changes to water quality (total suspended solids). Water quality will return to ambient state within seven days following the cessation of the disturbance.	Modified to refer to the OA instead of the entire Development Area.
EPO-02: Undertake seabed surveys of proposed wells and subsea infrastructure locations prior to final field layout design to ensure that: • infrastructure design footprints will be positioned to minimise disturbance to key ecological features • any emergent seabed features or other obstacles are avoided wherever practicable within technical and safety constraints.	Surveys have been conducted of proposed wells and subsea infrastructure locations prior to final field layout design. As no KEFs and no complex BCH were identified within the OA, CAPL considers the surveys appropriate to inform indicative well locations, such that they avoid any emergent seabed features or other obstacles wherever practicable within technical and safety constraints	N/A
EPO-03: No planned seabed disturbance from the Development to any previously undisturbed exposed hard substrate within the 'ancient coastline at 125 m depth contour' key ecological feature.	Not relevant to the scope of this petroleum activity. The OA is located outside of the ancient coastline at 125 m depth contour' key ecological feature. Consequently, this EPO does not apply.	N/A
EPO-04: Long-term direct disturbance from the Development is limited to 18.85 km^2 within the Development Area.	EPO-04: Long-term direct disturbance from the Gorgon Backfill Fields Development is limited to 18.85 km^2 within the Gorgon Backfill Development Area. EPS-9: Planned seabed disturbance from the petroleum activity will be within the spatial extents of either the 'long-term disturbance area' or the 'short-term	While the EPO from the OPP has been adopted, an EPS has been developed to further refine and reduce the seabed disturbance footprint to what is required for the petroleum activity.

Gorgon Backfill Fields OPP EPO	EPO/ EPS in EP/ Application in EP	Refinement and/or modifications in this EP
	disturbance area' as defined in the Gorgon Backfill Fields Development OPP.	
EPO-05: Short-term direct disturbance from the Development is limited to 0.98 km^2 within the Development Area.	EPO-05: Short-term direct disturbance from the Gorgon Backfill Fields Development is limited to 0.98 km^2 within the Gorgon Backfill Development Area. EPS-9: Planned seabed disturbance from the petroleum activity will be within the spatial extents of either the 'long-term disturbance area' or the 'short-term disturbance area' as defined in the Gorgon Backfill Fields Development OPP.	While the EPO from the OPP has been adopted, an EPS has been developed to further refine and reduce the seabed disturbance footprint to what is required for the petroleum activity.
EPO-06: Decommissioning of subsea infrastructure will not be inconsistent with obligations under the Offshore Petroleum and Greenhouse Gas Storage Act 2006 (Cth) and/or other relevant legislation in place at the time.	Not relevant to the scope of this petroleum activity. Decommissioning activities are outside of scope of this EP. Consequently, this EPO does not apply.	N/A.
EPO-07: Undertake an underwater cultural heritage assessment of proposed wells and subsea infrastructure locations prior to final field layout design to identify and report any suspected underwater cultural heritage and to ensure these areas are avoided (unless a permit under section 23 of the *Underwater Cultural Heritage Act 2018* (Cth) is granted).	A desktop UCH assessment of the OA was undertaken prior to final field layout design, and no known tangible UCH was identified in the OA (Section 5.6.2).	N/A.
EPO-08: No adverse impacts to declared underwater cultural heritage without a permit from planned activities associated with the Development.	EPO-08: No adverse impacts to declared UCH without a permit from planned activities associated with the petroleum activity.	Modified to refer to the petroleum activity instead of the entire Development.
EPO-09: No interference with First Nations cultural heritage values from planned activities associated with the Development to a greater extent than is necessary for the reasonable exercise of the rights and performance of duties.	EPO-09: No interference with First Nations cultural heritage values from planned activities associated with the petroleum activity to a greater extent than is necessary for the reasonable exercise of the rights and performance of duties.	Modified to refer to the petroleum activity instead of the entire Development. Intangible cultural heritage values are assessed as a standalone aspect in the EP, rather than being addressed under each aspect as in the OPP. Accordingly, this EPO has been relocated to the relevant EP aspect.

Gorgon Backfill Fields OPP EPO	EPO/ EPS in EP/ Application in EP	Refinement and/or modifications in this EP
Planned emissions—atmospheric		
EPO-10: Planned air emissions within the Development Area will not cause lasting changes to air quality. Air quality will return to ambient state within seven days following the cessation of the emission.	EPO-10: Planned air emissions within the OA will not cause lasting changes to air quality. Air quality will return to ambient state within seven days following the cessation of the emission.	Modified to refer to the OA instead of the entire Development
Planned emissions—GHG		
EPO-11: Manage GHG emissions from the 'Gorgon Operations Facility' in accordance with requirements under the Commonwealth Safeguard Mechanism and from the 'Gorgon GTP' in accordance with requirements under any in-force State or Commonwealth approval conditions for the Gorgon Gas Development.	EPO-11: GHG emissions are managed in accordance with requirements under the Commonwealth NGER and Safeguard Mechanism Schemes.	Modified to be broader in application than just the registered Gorgon Operations facility as NGER reporting obligations are the responsibility of the company with operational control. The registered NGERS and SGM "Gorgon Operations" facility includes relevant activities in Commonwealth waters. Reference to the Gorgon GTP has been removed as they are Barrow Island emissions and not within scope of the EP (Section 8.4.2).
EPO-12: Net GHG emissions associated with the transport and third-party end use of products from the Development do not represent a significant proportion of cumulative global GHG emissions and would be managed under the laws of the respective customer countries', which reflect among other things the countries' GHG emissions reduction ambitions and international commitments.	Not relevant to the scope of this petroleum activity. There is no transport and third-party end use of products from this petroleum activity. Consequently, this EPO does not apply.	N/A.
Planned emissions—artificial light		
EPO-13: Artificial light emissions from planned Development activities do not prevent light sensitive marine fauna[145] from undertaking biological important behaviours[146].	EPO-13: Artificial light emissions from planned petroleum activities do not prevent light sensitive marine fauna[145] from undertaking biological important behaviours[146].	Modified to refer to the petroleum activity instead of the entire Development

[145] Where light sensitive marine fauna includes marine turtles, seabirds and migratory shorebirds.

[146] Where biologically important behaviours are defined as behaviour associated with critical life functions (e.g. reproduction, foraging, migration, and resting) (Ref. 323).

Gorgon Backfill Fields OPP EPO	EPO/ EPS in EP/ Application in EP	Refinement and/or modifications in this EP
EPO-14: Artificial light within or adjacent to habitat critical to the survival of marine turtles[147] will be managed such that marine turtles are not displaced from these habitats.	Not relevant to the scope of this petroleum activity. The predicted artificial light exposure areas from artificial light emissions did not extend into habitat critical to the survival of marine turtles[147].	N/A.
EPO-15: Manage artificial light from offshore sources to ensure biologically important behaviours of: • nesting adults and emerging/dispersing hatchlings of the flatback turtle Pilbara stock (F-Pil) can continue • nesting adults and dispersing hatchlings of the hawksbill turtle WA (H-WA) can continue.	Not relevant to the scope of this petroleum activity. The OA is located ~75 km from Montebello Island. Given that artificial light exposure area is expected at distances of ~8.8 km from the MODU and vessels, and ~14.3 km from flaring activities, no light spill onto coastal or nearshore areas is expected. Therefore, adult nesting turtles and hatchlings are not expected to be exposed to artificial light emissions from the petroleum activity. Consequently, this EPO does not apply.	N/A.
EPO-16: Implement an adaptive management approach (CM-17[148]) for artificial light emissions from the Development such that it can be demonstrated that risks have been reduced to as low as reasonably practicable and can be managed to meet acceptable levels. The outcomes of this adaptive management approach will be incorporated into Environment Plans for the petroleum activities associated with this Development.	The intent of EPO-16 is met through the EP EPSs (EPS-17, EPS-18) which include mitigation measures to ensure potential risks from artificial light emissions are reduced to ALARP.	N/A.
EPO-09: Refer to seabed disturbance section above.	EPO-09	Refer to seabed disturbance section above.
Planned emissions—underwater sound (non-impulsive / impulsive)		
EPO-17: Sound emissions from planned Development activities will be managed such that EPBC Act listed species continue undertaking biological important behaviours[149].	EPO-17: Sound emissions from planned petroleum activities will be managed such that EPBC Act listed species continue undertaking biological important behaviours[149].	Modified to refer to the petroleum activity instead of the entire Development.

[147] Where habitat critical to the survival of marine turtle species is defined in Table 6 of the *Recovery Plan for Marine Turtles in Australia* (Ref. 291).

[148] In accordance with regulation 56 of the OPGGS(E)R, as this information has been previously supplied and is publicly available, the CM-17 has not been repeated here. The NOPSEMA-accepted Gorgon gas development backfill fields offshore project proposal is available online at: https://docs.nopsema.gov.au/A1265361

[149] Where biologically important behaviours are defined as behaviour associated with critical life functions (e.g. reproduction, foraging, migration, and resting) (Ref. 323)

Gorgon Backfill Fields OPP EPO	EPO/ EPS in EP/ Application in EP	Refinement and/or modifications in this EP
EPO-18: Sound emissions from planned Development activities will be managed to prevent TTS or AUD-INJ onset to EPBC Act listed species.	EPO-18: Sound emissions from planned petroleum activities will be managed to prevent TTS or AINJ onset to EPBC Act listed species.	Modified to refer to the petroleum activity instead of the entire Development.
EPO-19: Any blue whale continues to utilise the biologically important area without injury[150], and is not displaced from a foraging area[151] [152].	EPO-19: Any blue whale continues to utilise the biologically important area without injury[150], and is not displaced from a foraging area[151, 152].	N/A.
EPO-20: Any marine turtle is not displaced from identified habitat critical to the survival of the species[153].	Not relevant to the scope of this petroleum activity. The predicted ensonified areas from non-impulsive/ impulsive sound sources did not extend into HCTS[153] of marine turtle species.	N/A.
EPO-21: Any marine turtle continues to undertake biologically important behaviour within biologically important areas.	Not relevant to the scope of this petroleum activity. The predicted ensonified areas from non-impulsive/ impulsive sound sources did not extend into BIAs of marine turtle species.	N/A.
EPO-22: Undertake underwater sound assessments based on acoustic modelling (or equivalent, as appropriate to the nature and scale of the sound source) and predictions of ensonified areas that consider effect criteria based on contemporary guidance as available at the time. These assessments will be incorporated into Environment Plans for the petroleum activities associated with this Development.	Underwater sound modelling (or equivalent) was conducted for the activities identified in this petroleum activity and the predicted ensonified areas informed the risk assessment (Sections 8.6.2 and 8.7.2).	N/A.

[150] For the purpose of Action A.2.3 from the *Conservation Management Plan for the Blue Whale* (Ref. 52) 'injury to blue whales' is considered both PTS and TTS and any other form of physical harm arising from anthropogenic sources of underwater sound (Ref. 334).

[151] For the purpose of Action A.2.3 from the *Conservation Management Plan for the Blue Whale* (Ref. 52) 'displaced from a foraging area' applies in relation to BIAs (Ref. 334); and these BIAs correspond to 'Foraging Area', 'Possible Foraging Area', and 'Known Foraging Area' as illustrated in Figure 1 of the *Conservation Management Plan for the Blue Whale* (Ref. 52; Ref. 334). There are no Foraging Area BIAs within or adjacent to the DA.

[152] In accordance with Australian Government guidance, activities outside designated Foraging Areas should adopt adaptive management approaches in the event that indicators (e.g. aggregation in a particular area) of whale foraging are evident to ensure that impacts are not unacceptable (e.g. no injury or biologically significant disturbance) (Ref. 334). EPO-17 incorporates foraging as one of the biologically important behaviours of marine fauna, and EPO-23 applies adaptive management.

[153] Where habitat critical to the survival of marine turtle species is defined in Table 6 of the *Recovery Plan for Marine Turtles in Australia* (Ref. 291).

Gorgon Backfill Fields OPP EPO	EPO/ EPS in EP/ Application in EP	Refinement and/or modifications in this EP
EPO-23: Implement an adaptive management approach (CM-20, CM-21) for underwater sound emissions from the Development such that it can be demonstrated that risks have been reduced to as low as reasonably practicable and can be managed to meet acceptable levels. The outcomes of this adaptive management approach will be incorporated into Environment Plans for the petroleum activities associated with this Development.	The intent of EPO-23 is met through the EP EPSs (EPS-19, EPS-29, EPS-21, EPS-22, EPS-23) which include mitigation measures to ensure potential risks from non-impulsive/impulsive underwater sound are reduced to ALARP.	EP EPSs included mitigation measures to ensure potential risks from underwater sound emissions are reduced to ALARP.
EPO-09: Refer to seabed disturbance section above.	EPO-09	Refer to seabed disturbance section above.
Planned discharges—MODU and vessel discharges		
EPO-24: Planned discharges from general MODU and vessels operations within the Development Area will not cause lasting changes to water quality. Water quality will return to ambient state within seven days following the cessation of the discharge.	EPO-24: Planned discharges from general MODU and vessels operations within the OA will not cause lasting changes to water quality. Water quality will return to ambient state within seven days following the cessation of the discharge.	Modified to refer to the petroleum activity instead of the entire Development.
EPO-25: Planned discharges from general MODU and vessels operations within the Development Area will not cause lasting changes to marine fauna behaviour. Predator-prey dynamics will return to ambient state within seven days following the cessation of the discharge.	EPO-25: Planned discharges from general MODU and vessels operations within the OA will not cause lasting changes to marine fauna behaviour. Predator-prey dynamics will return to ambient state within seven days following the cessation of the discharge.	Modified to refer to the petroleum activity instead of the entire Development.
Planned discharges – Subsea operations		
EPO-26: Planned discharges from subsea operations within the Development Area will not cause lasting changes to water quality. Water quality will return to ambient state within seven days following the cessation of the discharge.	Not relevant to the scope of this petroleum activity. Planned discharges from subsea operations are outside of scope of this EP. Consequently, this EPO does not apply.	N/A.
EPO-27: Undertake hydrotest dispersion modelling (or equivalent) at sites representative of the deep water and shallow water environments within the Development Area. These assessments will be incorporated into Environment Plans for the petroleum activities associated with this Development.	Not relevant to the scope of this petroleum activity. Planned discharges from subsea operations are outside of scope of this EP. Consequently, this EPO does not apply.	N/A.

Gorgon Backfill Fields OPP EPO	EPO/ EPS in EP/ Application in EP	Refinement and/or modifications in this EP
Planned discharges—drilling operations		
EPO-28: Planned discharges from drilling operations within the Development Area will not cause lasting changes to water quality. Water quality will return to ambient state within seven days following the cessation of the discharge.	EPO-28: Planned discharges from drilling operations within the OA will not cause lasting changes to water quality. Water quality will return to ambient state within seven days following the cessation of the discharge.	Modified to refer to the petroleum activity instead of the entire Development
EPO-29: Planned discharges from drilling operations within the Development Area will only cause localised changes to sediment quality (i.e. within the vicinity of the drill centres).	EPO-29: Planned discharges from drilling operations within the OA will only cause localised changes to sediment quality (i.e. within the vicinity of the drill centres).	Modified to refer to the petroleum activity instead of the entire Development
EPO-30: Undertake drill cuttings dispersion modelling (or equivalent) at sites representative of the deep water and shallow water environments within the Development Area. These assessments will be incorporated into Environment Plans for the petroleum activities associated with this Development.	The intent of this EPO has been met as drill cuttings dispersion modelling was undertaken to inform the risk assessment in this EP (Section 8.9.2).	Noting the wider extent of the Development Area, drill cuttings dispersion modelling was conducted based on the activities identified in this petroleum activity and the predicted exposure area informed the risk assessment.
EPO-31: Planned discharges from drilling operations within the Development Area will only cause localised changes to benthic habitats and communities (i.e. within the vicinity of the drill centres).	EPO-31: Planned discharges from drilling operations within the OA will only cause localised changes to benthic habitats and communities (i.e. within the vicinity of the drill centres).	Modified to refer to the petroleum activity instead of the entire Development.
EPO-32: Planned discharges from drilling operations within the Development Area will not cause toxicity effects to benthic habitats or marine fauna.	EPO-32: Planned discharges from drilling operations within the OA will not cause toxicity effects to benthic habitats or marine fauna.	Modified to refer to the petroleum activity instead of the entire Development.
EPO-09: Refer to seabed disturbance section above.	EPO-09	Refer to seabed disturbance section above.
Unplanned disturbance—fauna interaction		
EPO-34: No death or injury of an EPBC Act listed threatened, migratory, or cetacean species from Development activities within the Development Area.	EPO-34: No death or injury of an EPBC Act listed threatened, migratory, or cetacean species from the petroleum activity within the OA.	Modified to refer to the petroleum activity instead of the entire Development
Non-indigenous species—Introduction of invasive marine pests		
EPO-35: No introduction and establishment of an invasive marine pest attributable to the Development.	EPO-35: No introduction of an invasive marine pest attributable to the petroleum activity.	Modified to refer to the petroleum activity instead of the entire Development, and to align with NOPSEMA's updated information paper on marine pest biosecurity (Ref. 527).

Gorgon Backfill Fields OPP EPO	EPO/ EPS in EP/ Application in EP	Refinement and/or modifications in this EP
Unplanned release—solid waste		
EPO-36: No unplanned release of solid objects to the environment attributable to the Development.	EPO-36: No unplanned release of solid objects to the environment attributable to the petroleum activity.	Unplanned solid releases are assessed as two different aspects in the EP (i.e. unplanned disturbance – seabed disturbance and unplanned release – waste). The Gorgon Backfill Fields OPP EPO-36 has been included in the unplanned release – waste aspect (Section 8.13.4) and modified to refer to the petroleum activity instead of the entire Development.
Unplanned release—leaks and spills		
EPO-37: No unplanned release of hydrocarbons or chemicals to the environment attributable to the Development.	EPO-37: No unplanned release of hydrocarbons or chemicals to the environment attributable to the petroleum activity.	Modified to refer to the petroleum activity instead of the entire Development.
Unplanned release – vessel collision		
EPO-38: No unplanned release of hydrocarbons to the environment attributable to the Development.	EPO-38: No unplanned release of hydrocarbons to the environment attributable to the petroleum activity.	Modified to refer to the petroleum activity instead of the entire Development.
Unplanned release – LOWC		
EPO-38: No unplanned release of hydrocarbons to the environment attributable to the Development.	EPO-38: No unplanned release of hydrocarbons to the environment attributable to the petroleum activity.	Modified to refer to the petroleum activity instead of the entire Development.

Appendix C Recovery plans, conservation advices, threat abatement plans, and wildlife conservation plans made under the EPBC Act

The relevant requirements of the recovery plans, conservation advices, threat abatement plans, and wildlife conservation plans made under the EPBC act and where these have been considered within the EP are summarised below.

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Conservation Management Plan for the Blue Whale 2015-2025 (Ref. 52)		
Objectives		
Recovery objective: The long-term recovery objective for blue whales is to minimise anthropogenic threats to allow for their conservation status to improve so that they can be removed from the EPBC Act threatened species list.	✓	
Interim recovery objective 1: The conservation status of blue whale populations is assessed using efficient and robust methodology.		
Interim recovery objective 2: The spatial and temporal distribution, identification of biologically important areas, and population structure of blue whales in Australian waters is described.		
Interim recovery objective 3: Current levels of legal and management protection for blue whales are maintained or improved and an appropriate adaptive management regime is in place.		
Interim recovery objective 4: Anthropogenic threats are demonstrably minimised.	✓	
Threats		
Whaling		
Climate Variability and Change	✓	Section 8.4
Noise Interference	✓	Sections 8.6 and 8.7
Habitat Modification		
Vessel Disturbance	✓	Section 8.10
Overharvesting of prey		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Actions		
Action Area A.1: Maintain and improve legal and management protection.		
Action A.1.1: Continue or improve existing legislative management actions as identified in Section 2 of this (Conservation Management) Plan.		
Action A.1.2: Maintain the currency of management advice and actions.		
Action Area A.2: Assessing and addressing anthropogenic noise.		
Action A.2.1: Investigating the baseline acoustic behaviour of blue whales.		
Action A.2.2: Assessing the effect of anthropogenic noise on blue whale behaviour.	✓	Sections 8.6 and 8.7
Action A.2.3: Anthropogenic noise in biologically important areas will be managed such that any blue whale continues to utilise the area without injury, and is not displaced from a foraging area.	✓	Sections 8.6 and 8.7
Action A.2.4: EPBC Act Policy Statement 2.1—Interaction between offshore seismic exploration and whales is applied to all seismic surveys.		
Action A.2.5: Ensuring behavioural impacts are considered when developing and updating policy documents on the management of cetaceans and anthropogenic noise.		
Action Area A.3: Understanding impacts of climate variability and change.		
Action A.3.1: Continue to meet Australia's international commitments to reduce greenhouse gas emissions and regulate the krill fishery in Antarctica.	✓	Section 8.4
Action Area A.4: Minimising vessel collisions.		
Action A.4.1: Develop a national vessel strike strategy that investigates the risk of vessel strike on blue whales and also identifies potential mitigation measures.		
Action A.4.2: Ensure all vessel strike incidents are reported in the National Ship Strike Database.	✓	Section 10.6.2
Action A.4.3: 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 8.10
National Recovery Plan for albatrosses and petrels (2022) *(*Ref. 304*)*		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Objectives		
Long-term vision: The populations of albatross and petrel species breeding and/or foraging in Australia's jurisdiction have increased to such a size that each species no longer qualifies for listing as threatened under any of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) listing criteria.		
Recovery plan objective: To improve the conservation status of albatrosses and petrels so that these species are on a trajectory towards no longer being threatened in Australia's jurisdiction.	✓	
Strategy 1: Ensure ongoing protection of albatross and petrel breeding sites and habitats in Australia's jurisdiction.		
Strategy 2: Improve the understanding of the size, structure and population trends for albatrosses and petrels breeding in Australia's jurisdiction.		
Strategy 3: Improve effectiveness of management measures that reduce land-based threats to albatrosses and petrels breeding in Australia's jurisdiction.		
Strategy 4: Improve effectiveness of management measures that reduce marine-based threats to albatrosses and petrels foraging in Australia's jurisdiction.	✓	
Strategy 5: Improve understanding of generalised threats to albatrosses and petrels breeding and foraging within Australia's jurisdiction.		
Strategy 6: Improve community awareness of the conservation of albatrosses and petrels.		
Strategy 7: Achieve substantial progress towards global conservation of albatrosses and petrels in international conservation and fishing forums.		
Threats		
Terrestrial threats–human disturbance		
Terrestrial threats–introduced invasive species		
Terrestrial threats–competition with native species		
Terrestrial threats–disease		
Terrestrial threats–geological processes		
Terrestrial threats–climate variability and change		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Marine threats–fisheries interactions and bycatch		
Marine threats–longline fishing operations		
Marine threats–trawl fishing operations		
Marine threats–gillnet fishing operations		
Marine threats–deliberate take		
Marine threats–marine pollution (fuel and oil spills, chemical contaminants and marine debris)	✓	Sections 8.13, 8.14, 8.15, 8.16 and 8.17
Marine threats–competition with fisheries for prey species		
Marine threats–dependence on fisheries discards		
Marine threats–marine infrastructure interactions		
Marine threats–climate variability and change	✓	Section 8.4
Actions		
Action Area A.1: Ongoing protection of albatross and petrel breeding sites and habitats in Australia's jurisdiction.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area B.1: Monitor population and conservation status of breeding populations of albatrosses and petrels in Australia's jurisdiction.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area A.2: Prevent introduction of pest species to albatross and petrel breeding islands.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area A.3: Identify whether competition with native species is causing a population level decline in the numbers of Shy Albatross at Pedra Branca.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area A.4: Identify diseases likely to have a population level effect on breeding populations.		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area A.5: Avoid or minimise bycatch of albatrosses and petrels during fishing operations in Australia's jurisdiction.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area B.2: Monitor effects of fishing on albatrosses and petrels in Australia's jurisdiction.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area B.4: Improve understanding of the effects of climate change on albatrosses and petrels, and identify ways to increase the resilience of the species to these effects.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area A.7: Improve understanding of and reduce the effects of marine debris, plastics and pollution on albatrosses and petrels.		
Action 5b: Undertake, a feasible, monitoring of breeding colonies for marine debris, plastics and marine pollution impacts including, as a priority: ○ incidence of oiled birds at nest ○ levels of marine debris egestion and entanglement at nest ○ effect of plastics and marine pollution ○ develop baseline measures of levels of heavy metals and persistent organic pollutants.	✓	Sections 8.14, 8.15, 8.16 and 8.17
Action 5c: Risk based response strategies for marine pollution incidents are developed.	✓	Sections 8.14, 8.15, 8.16 and 8.17
Action Area B.5: Establish and maintain a Recovery Team for threatened albatrosses and petrels.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area B.5: Review the recovery plan within five years after making.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area B.3: Develop and implement a broad strategy to raise awareness and educate the public and industry about albatross and petrel conservation.		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area B.3: Support use of citizen science in the conservation of albatrosses and petrels.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area A.6: Advocate for effective international measures for conserving albatrosses and petrels.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area A.6: Avoid or minimise bycatch of albatrosses and petrels during fishing operations involving Australian vessels operating beyond Australia's jurisdiction.		
N/A (not a relevant action area for an offshore petroleum activity)..		
National Recovery Plan for the Australian Fairy Tern *Sternula nereis nerei* (Ref. 496)		
Objectives		
Long-term vision: The Australian fairy tern population has increased in size to such an extent that the species no longer qualifies for listing as threatened under any of the *Environment Protection and Biodiversity Conservation Act 1999* listing criteria.	✓	
Recovery plan objective: By 2030, sustain a positive population trend (compared to 2020 baseline counts) in the number of mature individuals of the Australian Fairy Tern in both the eastern and western populations. This will be achieved by implementing the actions set out in this Recovery Plan that minimise threats while protecting the species' habitat throughout its range, adequately monitoring the species, generating new knowledge to guide recovery and increasing public awareness.	✓	
Strategy 1: Manage and protect known Australian fairy tern breeding populations at the landscape scale.		
Strategy 2: Develop and apply techniques to measure changes in population trend(s) in order to measure the efficacy of recovery actions.		
Strategy 3: Reduce, or eliminate threats at breeding, non-breeding and foraging sites.	✓	
Strategy 4: Undertake research and monitoring to improve understanding of breeding, non-breeding and foraging attributes in order to better target management actions and habitat restoration.		
Strategy 5: Engage community stakeholders in Australian fairy tern conservation.		
Strategy 6: Coordinate, review and report on recovery progress.		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Threats		
Habitat degradation and loss of breeding habitat		
Disturbance		
Invasive species		
Native wildlife		
Climate variability and change	✓	Section 8.4
Water management and increased salinity		
Pollution	✓	Sections 8.14, 8.15, 8.16 and 8.17
Hybridisation		
Actions		
Strategy 1:		
N/A (not a relevant action area for an offshore petroleum activity).		
Strategy 2:		
N/A (not a relevant action area for an offshore petroleum activity).		
Strategy 3:		
N/A (not a relevant action area for an offshore petroleum activity).		
Strategy 4:		
N/A (not a relevant action area for an offshore petroleum activity).		
Strategy 5:		
N/A (not a relevant action area for an offshore petroleum activity).		
Strategy 6:		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
N/A (not a relevant action area for an offshore petroleum activity).		
National Recovery Plan for the Australian Painted Snipe *Rostratula australis* (Ref. 493)		
Objectives		
Long-term vision: The Australian Painted Snipe population has increased in size to such an extent that the species no longer qualifies for listing as threatened under any of the *Environment Protection and Biodiversity Conservation Act 1999* listing criteria.	✓	
Recovery plan objective: By 2032, sustain a positive population trend (compared to 2020 baseline counts) in the number of mature individuals of the Australian Painted Snipe. This will be achieved by implementing the actions set out in this Recovery Plan that minimise threats while protecting the species' habitat throughout its range, generating new knowledge to guide recovery and increasing public awareness.	✓	
Strategy 1: Manage and protect known Australian painted snipe habitat at the landscape scale.		
Strategy 2: Develop and apply techniques to measure changes in population trajectory in order to measure the success of recovery actions.		
Strategy 3: Reduce, or eliminate threats at breeding and non-breeding habitats.	✓	
Strategy 4: Undertake research to improve knowledge of the habitat requirements, biology and behaviour of Australian painted snipe.		
Strategy 5: Engage community stakeholders to improve awareness of the conservation of Australian painted snipe.		
Strategy 6: Coordinate, review and report on recovery progress.		
Threats		
Changes to water regimes and structural changes to wetlands		
Drainage of wetlands and fragmentation of waterways		
Deterioration of water quality		
Invasive plants		
Climate variability and change	✓	Section 8.4
Livestock overgrazing		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Invasive animals		
Human disturbance		
Fire		
Low genetic diversity		
Actions		
Strategy 1:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Strategy 2:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Strategy 3:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Strategy 4:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Strategy 5:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Strategy 6:		
N/A (not a relevant action area for an offshore petroleum activity)..		
National Recovery Plan for the Southern Right Whale *(Eubalaena australis)* (Ref. 111)		
Objectives		
Long-term vision: The long-term vision for the recovery of the southern right whale is that the population has increased in size to a level that the conservation status has improved, and the species no longer qualifies for listing as threatened under any of the EPBC Act listing criteria.	✓	

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Due to intense historical exploitation of southern right whales and the species' life history characteristics, any population recovery to, or near, pre-exploitation levels will likely be a long process (i.e., multi-decadal). Consequently, achieving the long-term vision for southern right whales utilising Australian waters is also likely to occur over this timeframe.		
Interim objective 1: Current levels of Commonwealth and State legislative and management protection for southern right whales are implemented, maintained, or improved, so threats continue to be managed and reduced over the life of the plan.		
Interim objective 2: Anthropogenic threats are managed consistent with ecologically sustainable development principles to facilitate recovery of southern right whales.	✓	
Interim objective 3: Population dynamics, including demographics, distribution, residency, and coastal movement across the species range are monitored and quantified using robust, standardised, best-practice methodology to assess population recovery.		
Interim objective 4: The population structure of southern right whales in Australian waters is clearly characterised, including the level of interchange of individuals among coastal reproductive areas, to evaluate the degree to which the western and eastern populations are separate populations and inform the degree of connectivity with other southern right whale populations (e.g., New Zealand).		
Interim objective 5: Capability of First Nation Australians, research, citizen science, and general community groups is improved to assist in addressing recovery actions of southern right whales in Australia.		
Threats		
Anthropogenic climate change and climate variability	✓	Section 8.4
Entanglement: Active fishing or aquaculture equipment		
Entanglement: Marine debris		
Habitat degradation: Infrastructure/coastal development		
Habitat degradation: Infrastructure/offshore development		
Anthropogenic underwater noise: Industrial noise		
Anthropogenic underwater noise: Seismic surveys		
Anthropogenic underwater noise: Vessel noise		
Anthropogenic underwater noise: Aircraft noise		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Collision: Vessel strike		
Disturbance from vessels and water activities: Boat-based whale watching		
Disturbance from vessels and water activities: Recreational vessels and waterborne activities		
Whaling		
Prey depletion from climate change		
Prey depletion from overfishing		
Prey depletion from seismic survey		
Pollution: Chronic chemical pollution		
Pollution: Acute chemical pollution	✓	Sections 8.14, 8.15, 8.16 and 8.17
Pollution: Electromagnetic field disturbance		
Actions		
Action Area A.1: Maintain, implement, and improve efficacy of current legislative and management protection for southern right whales.		
Action A.1.1: Maintain, implement, and improve efficacy of existing legislation and management arrangements (e.g. Managements Plans and Guidelines) as listed under section 1.2.		
Action A.1.2: Maintain functional utility of management advice and actions through clear communication among stakeholders, and periodic review.		
Action Area A.2: Address habitat degradation impacts from coastal and offshore marine infrastructure developments within the species' range.		
Action A.2.1: Coastal and offshore development actions are assessed according to principles of ecological sustainable development to ensure the risk of injury, auditory impairment and/or disturbance to southern right whales is minimised.		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Action A.2.2: Baseline surveys and monitoring undertaken during activity implementation are conducted in accordance with best practice standards and guidelines to ensure standardised datasets are obtained and suitable to inform environmental management decision making that can reduce the risk of threats to southern right whales.		
Action A.2.3: Current information on species' occurrence, particularly in HCTS, BIAs, and historic high use areas, are used to inform planning, assessment, and decision-making on marine infrastructure development actions.		
Action Area A.3: Understand impacts of climate variability and anthropogenic climate change on the species biology and population recovery.		
Action A.3.1: Continue to meet Australia's international commitments to address causes of climate change, including greenhouse gas emissions.	✓	Section 8.4
Action A.3.2: Continue to contribute via CCAMLR to the sustainable management of the krill fishery in Antarctica to mediate potential reduction in prey resources due to climate change		
Action A.3.3: Support international collaborations in understanding the responses of southern right whales to climate variability and change through ongoing commitments to the IWC and CCAMLR		
Action A.3.4: Increase understanding of the effects of anthropogenic climate change on environmental conditions, including the impacts on prey availability in high latitude foraging areas and links with southern right whale foraging ecology, health, and population demographics (e.g. reproductive success)		
Action Area A.4: Manage and mitigate the threat of entanglements from commercial active or discarded fishing gear throughout the species' range in Australian waters		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area A.5: Assess, manage, and mitigate impacts from anthropogenic underwater noise.		
Action A.5.1: Improve baseline understanding of southern right whale acoustic communication to better inform potential impacts from anthropogenic underwater noise.		
Action A.5.2: Actions within and adjacent to southern right whale BIAs and HCTS should demonstrate that it does not prevent any southern right whale from utilising the area or cause auditory impairment		
Action A.5.3: Actions within and adjacent to southern right whale BIAs and HCTS should demonstrate that the risk of behavioural disturbance is minimised		
Action A.5.4: 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		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
anthropogenic underwater noise and implement appropriate mitigation measures to reduce risks to southern right whales to the lowest possible level		
Action A.5.5: Quantify risks of anthropogenic underwater noise to southern right whales, including studies aimed to measure physiological effects, behavioural disturbance, and changes to acoustic communication (e.g., masking of vocalisations) to whales		
Action A.5.6: Prioritise government/industry funding opportunities to support research to identify short and long-term responses of southern right whales to underwater noise		
Action A.5.7: Improve understanding and characterisation of marine soundscapes, including the application of new technologies for data processing, within southern right whale BIAs to facilitate quantification of anthropogenic noise in the marine soundscape		
Action Area A.6: Manage, minimise, and mitigate the threat of vessel strike.		
Action A.6.1: Assess risk of vessel strike to southern right whales in BIAs		
Action A.6.2: Improve understanding of the behavioural response of southern right whales in close vicinity to vessels (e.g., type, number, distance) in BIAs to inform risk assessments of vessel strike		
Action A.6.3: Ensure environmental impact assessments and associated plans consider and quantify the risk of vessel strike and associated potential cumulative risks in BIAs and HCTS		
Action A.6.4: Undertake a review of the National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna 2017, and update if necessary.		
Action A.6.5: Ensure all vessel strike incidents are reported in the National Ship Strike Database managed through the Australian Marine Mammal Centre, Australian Antarctic Division		
Recovery Plan for Marine Turtles in Australia (Ref. 291)		
Objectives		
Long-term recovery objective: Minimise anthropogenic threats to allow for the conservation status of marine turtles to improve so that they can be removed from the EPBC Act threatened species list.	✓	
Interim objective 1: Current levels of legal and management protection for marine turtles are maintained or improved both domestically and throughout the migratory range of Australia's marine turtles.		
Interim objective 2: The management of marine turtles is supported.		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Interim objective 3: Anthropogenic threats are demonstrably minimised.	✓	
Interim objective 4: Trends at index beaches, and population demographics at important foraging grounds are described.		
Threats		
Climate change and variability	✓	Section 8.4
Marine debris	✓	Section 8.13
Chemical and terrestrial discharge	✓	Sections 8.14, 8.15, 8.16 and 8.17
International take		
Terrestrial predation		
Fisheries bycatch		
Light pollution	✓	Section 8.5
Habitat modification		
Indigenous take		
Vessel disturbance	✓	Section 8.10
Noise interference	✓	Sections 8.6 and 8.7
Recreational activities		
Diseases and pathogens		
Actions		
Action Area A.1: Maintain and improve efficacy of legal and management protection.		
Action A.1.1: Align the threat status of marine turtles in range jurisdictions through the operation of the Intergovernmental Memorandum of Understanding: agreement on a common assessment method for listing of threatened species and ecological communities.		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Action A.1.2: Maintain, implement and improve efficacy of existing management arrangements as listed at Sections 2 and 4.3 [of this Recovery Plan].		
Action A.1.3: Maintain and improve biological information, including spatial information, used to inform robust decision making		
Action A.1.4: Develop and implement nationwide significant impact guidelines for marine turtles		
Action A.1.5: Manage anthropogenic activities to ensure marine turtles are not displaced from identified habitat critical to the survival as per section 3.3 Table 6 [of this Recovery Plan].	✓	Sections 8.6 and 8.7
Action A.1.6: Manage anthropogenic activities in Biologically Important Areas to ensure that biologically important behaviour can continue	✓	Sections 8.6 and 8.7
Action A.1.7: Develop robust criteria for the identification of habitat critical to the survival of each stock for foraging, migration, mating and hatchling dispersal.		
Action Area A.2: Adaptively manage turtle stocks to reduce risk and build resilience to climate change and variability.		
Action A.2.1: Continue to meet Australia's international commitments to address the causes of climate change.	✓	Section 8.4
Action A.2.2: Identify and protect areas for range expansion and identify areas of refugia.		
Action A.2.3: Identify, test and implement climate based adaptation measures.		
Action A.2.4: Increase understanding of the evolutionary capacity of marine turtles to adapt to a changing environment.		
Action Area A.3: Reduce the impacts from marine debris.		
Action A.3.1: Maintain and expand international and domestic partnership arrangements for the source reduction, collection and management of marine debris.		
Action A.3.2: Compare marine debris hotspots with important foraging areas, post hatchling dispersal and adult migratory pathways to identify high priority areas for mitigation to reduce turtle/debris interactions.		
Action A.3.3: Genetic samples are taken from animals caught in ghost nets.		
Action A.3.4: Describe and quantify the impact of ingestion of debris on marine turtles, particularly those life phases using the open ocean.	✓	Section 8.13

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Action A.3.5: Support the implementation of the EPBC Act Threat Abatement Plan for the impacts of marine debris on vertebrate marine life.	✓	Section 8.13
Action Area A.4: Minimise chemical and terrestrial discharge.		
Action A.4.1: Implement best practice industrial, urban and agricultural runoff and storm water management for new and existing developments in coastal catchments to minimise impacts to marine turtle health and habitats.		
Action A.4.2: 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.	✓	Sections 8.14, 8.15, 8.16 and 8.17
Action A.4.3: Quantify the impacts of decreased water quality on stock viability.		
Action A.4.4: Quantify the accumulation and effects of anthropogenic toxins in marine turtles, their foraging habitats and subsequent stock viability.		
Action Area A.5: Address international take within and outside Australia's jurisdiction.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area A.6: Reduce impacts from terrestrial predation		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area A.7: Reduce international and domestic fisheries bycatch		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area A.8: Minimise light pollution		
Action A.8.1: 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 as per section 3.3 Table 6 [of this Recovery Plan].	✓	Section 8.5
Action A.8.2: Develop and implement best practice light management guidelines for existing and future developments adjacent to marine turtle nesting beaches.		
Action A.8.3: Identify the cumulative impact on turtles from multiple sources of onshore and offshore light pollution.		
Action Area A.9: Address the impacts of coastal development/infrastructure and dredging and trawling		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Action A.9.1: Manage infrastructure, coastal development, dredging and trawling to ensure ongoing biologically important behaviours for marine turtle stocks continues.		
Action A.9.2: Use up-to-date information regarding nesting, internesting and foraging habitat to inform future development proposals and approval decisions.		
Action A.9.3: Assess the impact of trawling on the benthic environment in marine turtle foraging habitat and determine whether it is likely to have an impact on stock viability.		
Action Area A.10: Maintain and improve sustainable Indigenous management of marine turtles		
N/A (not a relevant action area for an offshore petroleum activity).		
Recovery Plan for the Grey Nurse Shark (Ref. 487)		
Objectives		
Recovery objective: To assist the recovery of the grey nurse shark in the wild, throughout its range in Australian waters, with a view to: • improving the population status, leading to future removal of the grey nurse shark from the threatened species list of the EPBC Act • ensuring that anthropogenic activities do not hinder the recovery of the grey nurse shark in the near future, or impact on the conservation status of the species in the future.	✓	
Interim recovery objective 1: Develop and apply quantitative monitoring of the population status (distribution and abundance) and potential recovery of the grey nurse shark in Australian waters.		
Interim recovery objective 2: Quantify and reduce the impact of commercial fishing on the grey nurse shark through incidental (accidental and/or illegal) take, throughout its range.		
Interim recovery objective 3: Quantify and reduce the impact of recreational fishing on the grey nurse shark through incidental (accidental and/or illegal) take, throughout its range.		
Interim recovery objective 4: Where practicable, minimise the impact of shark control activities on the grey nurse shark.		
Interim recovery objective 5: Investigate and manage the impact of ecotourism on the grey nurse shark.		
Interim recovery objective 6: Manage the impact of aquarium collection on the grey nurse shark.		
Interim recovery objective 7: Improve understanding of the threat of pollution and disease to the grey nurse shark.	✓	

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Interim recovery objective 8: Continue to identify and protect habitat critical to the survival of the grey nurse shark and reduce the impact of threatening processes within these areas.		
Interim recovery objective 9: Continue to develop and implement research programs to support the conservation of the grey nurse shark.		
Interim recovery objective 10: Promote community education and awareness in relation to grey nurse shark conservation and management.		
Threats		
Incidental (accidental and/or illegal) capture by commercial and recreational fisheries.		
Shark control activities such as beach meshing or drumlining.		
Ecotourism (potential threat)		
Collection for public aquaria (potential threat)		
Pollution and disease (potential threat)	✓	Sections 8.14, 8.15, 8.16 and 8.17
Ecosystem effects as a result of habitat modification and climate change (potential threat)	✓	Section 8.4
Actions		
Action Area 1: Address Interim recovery objective 1.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area 2: Address Interim recovery objective 2.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area 3: Address Interim recovery objective 3.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area 4: Address Interim recovery objective 4.		
N/A (not a relevant action area for an offshore petroleum activity)..		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Action Area 5: Address Interim recovery objective 5.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 6: Address Interim recovery objective 6.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 7: Address Interim recovery objective 7.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 8: Address Interim recovery objective 8.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 9: Address Interim recovery objective 9.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 10: Address Interim recovery objective 10.		
N/A (not a relevant action area for an offshore petroleum activity).		
Recovery Plan for the white shark (Ref. 488)		
Objectives		
Recovery objective: To assist the recovery of the white shark in the wild throughout its range in Australian waters with a view to: • improving the population status leading to future removal of the white shark from the threatened species list of the EPBC Act • ensuring that anthropogenic activities do not hinder recovery in the near future, or impact on the conservation status of the species in the future.	✓	
Interim recovery objective 1: Develop and apply quantitative measures to assess population trends and any recovery of the white shark in Australian waters and monitor population trends.		
Interim recovery objective 2: Quantify and minimise the impact of commercial fishing, including aquaculture, on the white shark through incidental (illegal and/or accidental) take, throughout its range in Australian waters.		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Interim recovery objective 3: Quantify and minimise the impact of recreational fishing on the white shark through incidental (illegal and/or accidental) take, throughout its range in Australian waters.		
Interim recovery objective 4: Where practicable minimise the impact of shark control activities on the white shark		
Interim recovery objective 5: Investigate and manage (and where necessary reduce) the impact of tourism on the white shark.		
Interim recovery objective 6: Quantify and minimise the impact of international trade in white shark products through implementation of CITES provisions.		
Interim recovery objective 7: Continue to identify and protect habitat critical to the survival of the white shark and minimise the impact of threatening processes within these areas.		
Interim recovery objective 8: Continue to develop and implement relevant research programs to support the conservation of the white shark.		
Interim recovery objective 9: Promote community education and awareness in relation to white shark conservation and management.		
Interim recovery objective 10: Encourage the development of regional partnerships to enhance the conservation and management of the white shark across national and international jurisdictions.		
Threats		
Being caught accidentally (bycatch) or illegally (targeted) by commercial and recreational fisheries		
Shark control activities such as beach meshing or drumlining (east coast population).		
Illegal trade (potential threat)		
Ecosystem effects as a result of habitat modification and climate change (potential threat)	✓	Section 8.4
Ecotourism (potential threat)		
Actions		
Action Area 1: Address Interim recovery objective 1.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area 2: Address Interim recovery objective 2.		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 3: Address Interim recovery objective 3.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 4: Address Interim recovery objective 4.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 5: Address Interim recovery objective 5.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 6: Address Interim recovery objective 6.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 7: Address Interim recovery objective 7.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 8: Address Interim recovery objective 8.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 9: Address Interim recovery objective 9.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action Area 10: Address Interim recovery objective 10.		
N/A (not a relevant action area for an offshore petroleum activity).		
Sawfish and river sharks Multispecies Recovery Plan (Ref. 409)		
Objectives		
Recovery objective: Improving the population status leading to the removal of the sawfish and river shark species from the threatened species list of the EPBC Act.	✓	
Recovery objective: Ensuring that anthropogenic activities do not hinder recovery in the near future, or impact on the conservation status of the species in the future	✓	

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Interim recovery objective 1: Reduce and, where possible, eliminate adverse impacts of commercial fishing on sawfish and river shark species.		
Interim recovery objective 2: Reduce and, where possible, eliminate adverse impacts of recreational fishing on sawfish and river shark species.		
Interim recovery objective 3: Reduce and, where possible, eliminate adverse impacts of Indigenous fishing on sawfish and river shark species.		
Interim recovery objective 4: Reduce and, where possible, eliminate the impact of illegal, unregulated and unreported fishing on sawfish and river shark species.		
Interim recovery objective 5: Reduce and, where possible, eliminate adverse impacts of habitat degradation and modification on sawfish and river shark species.	✓	
Interim recovery objective 6: Reduce and, where possible, eliminate any adverse impacts of marine debris on sawfish and river shark species noting the linkages with the Threat Abatement Plan for the Impact of Marine Debris on Vertebrate Marine Life.	✓	
Interim recovery objective 7: Reduce and, where possible, eliminate any adverse impacts of collection for public aquaria on sawfish and river shark species.		
Interim recovery objective 8: Improve the information base to allow the development of a quantitative framework to assess the recovery of, and inform management options for, sawfish and river shark species.		
Interim recovery objective 9: Develop research programs to assist conservation of sawfish and river shark species.		
Interim recovery objective 10: Improve community understanding and awareness in relation to sawfish and river shark conservation and management.		
Threats		
Fishing activities		
Habitat degradation and modification	✓	Section 8.4
Collection of animals for display in public aquaria (potential threat)		
Marine debris (potential threat)	✓	Section 8.13
Actions		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Action Area 1: Address Interim recovery objective 1.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area 2: Address Interim recovery objective 2.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area 3: Address Interim recovery objective 3.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area 4: Address Interim recovery objective 4.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area 5: Address Interim recovery objective 5.		
Action 5a: Ensure all future developments will not significantly impact upon sawfish and river shark habitats critical to the survival of the species, or impede upon the migration of individual sawfish or river sharks.		
Action 5b: Determine the effect of river and estuarine barriers on the movements of sawfish and river sharks and undertake an audit of barriers to establish whether removal or modification is feasible to allow for the riverine migration of sawfish and river sharks.		
Action 5c: Identify risks to important sawfish and river shark habitat and measures needed to reduce those risks.	✓	Section 8.4
Action 5d: Implement measures to reduce adverse impacts of habitat degradation and/or modification.		
Action Area 6a: Address Interim recovery objective 6.		
Action 6a: Assess the impacts of marine debris including ghost nets, fishing gear and plastics on sawfish and river shark species.	✓	Section 8.13
Action 6b: Partner with marine debris organisations to support initiatives that reduce marine debris likely to impact on sawfish and river sharks.		
Action Area 7: Address Interim recovery objective 7.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area 8: Address Interim recovery objective 8.		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area 9: Address Interim recovery objective 9.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Action Area 10: Address Interim recovery objective 10.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Wildlife Conservation Plan for Migratory Shorebirds (Ref. 303)		
Objectives		
Objective 1: Protection of important habitats for migratory shorebirds has occurred throughout the EAAF.		
Objective 2: Wetland habitats in Australia, on which migratory shorebirds depend, are protected and conserved		
Objective 3: Anthropogenic threats to migratory shorebirds in Australia are minimised or, where possible, eliminated	✓	
Objective 4: Knowledge gaps in migratory shorebird ecology in Australia are identified and addressed to inform decision makers, land managers and the public		
Threats		
Habitat loss–Infrastructure / coastal development in Australia		
Habitat loss– Infrastructure /coastal development in staging and stop-over areas, particularly the Yellow Sea		
Habitat modification–chronic pollution		
Habitat modification–acute pollution	✓	Sections 8.14, 8.15, 8.16 and 8.17
Habitat modification–invasive species		
Habitat modification–altered hydrological regimes		
Anthropogenic disturbance		
Climate variability and change	✓	Section 8.4

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Harvesting of shorebird prey		
Fisheries by-catch		
Hunting		
Actions		
Action 1: Address objective 1.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action 2: Address objective 2.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action 3: Address objective 3.		
Action 3a: Develop and implement a community education and awareness program to reduce the effects of recreational disturbance on migratory shorebirds.		
Action 3b: Investigate the impacts of climate change on migratory shorebird habitat and populations in Australia.		
Action 3c: Investigate the significance of cumulative impacts on migratory shorebird habitat and populations in Australia		
Action 3d: Investigate the impacts of hunting and shorebird prey harvesting on migratory shorebirds in Australia and the EAAF.		
Action 3e: Develop guidelines for wetland rehabilitation and the creation of artificial wetlands to support populations of migratory shorebirds		
Action 3f: Ensure all areas important to migratory shorebirds in Australia continue to be considered in development assessment processes.	✓	Section 8.4
Action 4: Address objective 4.		
N/A (not a relevant action area for an offshore petroleum activity)..		
Wildlife Conservation Plan for Seabirds (Ref. 80)		
Objectives		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Objective 1: International cooperation and collaboration continue to support the survival of seabirds and their habitats outside Australian jurisdiction.		
Objective 2: Seabirds and their habitats are identified, protected and managed in Australia.	✓	
Objective 3: The long-term survival of seabirds and their habitats is achieved through supporting priority research programs, coordinated monitoring, on-ground management and conservation.		
Objective 4: Increase the awareness of the importance of conserving seabirds and their habitats through community education and capacity building to support monitoring and on-ground management.		
Threats		
Habitat loss–Coastal development		
Habitat modification		
Climate variability and change–climate change	✓	Section 8.4
Climate variability and change–el Niño Southern Oscillation		
Climate variability and change–storms and cyclones		
Geological processes–Volcanism		
Geological processes– Earthquake, tsunami and landslips		
Invasive species		
Native wildlife		
Fisheries interactions and by-catch		
Prey depletion		
Resource extraction		
Renewable energy		
Anthropogenic disturbance		
Hunting		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Transport–shipping	✓	
Transport–aircraft	✓	Section 8.10
Drones		
Pollution–marine debris	✓	Section 8.13
Pollution–light pollution	✓	Section 8.5
Pollution–chronic pollution		
Pollution–acute pollution	✓	Sections 8.14, 8.15, 8.16 and 8.17
Pollution–heavy metals	✓	Section 8.9
Aquaculture		
Disease		
Actions		
Action 1: Address objective 1.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action 2: Address objective 2.		
Action 2a: Identify important habitats for all seabirds during critical life stages.		
Action 2b: Complete a review and update the conservation status of all seabirds in Australia.		
Action 2c: Develop a national seabird breeding colony register.		
Action 2d: Ensure all areas of important habitat for seabirds are considered appropriately and consistently in the development assessment process.	✓	Section 8.4
Action 2e: Manage the effects of anthropogenic disturbance to seabird breeding and roosting areas		
Action 2f: Manage invasive species at important seabird habitats.		

Recovery Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Action 2g: Implement actions under Australia's NPOA-Seabirds and Longline Threat Abatement Plan.		
Action 2h: Enhance contingency plans to prevent and/or respond to environmental emergencies that have an impact on seabirds and their habitats.	✓	Sections 8.14, 8.15, 8.16 and 8.17
Action 2i: Restore lost or degraded seabird breeding and roosting habitats.		
Action 3: Address objective 3.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action 4: Address objective 4.		
N/A (not a relevant action area for an offshore petroleum activity).		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Conservation Advice for Abbott's Booby *Papasula abbotti* (Ref. 491)		
Objective		
Long-term objective: To reduce anthropogenic threats to allow the conservation status of *Papasula abbotti* (Abbott's Booby) to improve so that it can be removed from the threatened species list of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).	✓	
Short-term objective 1: The extent and quality of habitat critical to the survival of Abbott's Booby is maintained or improved.	✓	
Short-term objective 2: Anthropogenic threats to Abbott's Booby are demonstrably reduced	✓	
Short-term objective 3: The current levels of legislative protection for Abbott's Booby are maintained or improved.		
Short-term objective 4: The recovery of Abbott's Booby is adequately supported by monitoring and research.		
Short-term objective 5: Community and stakeholder understanding of and engagement in the conservation management of Abbott's Booby is supported.		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Threats		
Vegetation clearing		
Climate change	✓	Section 8.4
Introduction of a new disease		
Invasive weeds		
Yellow crazy ants–habitat modification		
Fisheries–prey depletion		
Marine debris–plastics	✓	Section 8.13
Actions		
Vegetation clearance:		
N/A (not a relevant action area for an offshore petroleum activity).		
Climate Change		
Develop and implement a response plan to enhance the adaptation of Abbott's Booby to climate change.		
Introduction of a new disease		
N/A (not a relevant action area for an offshore petroleum activity).		
Invasive weeds		
N/A (not a relevant action area for an offshore petroleum activity).		
Maintain or improve current policies and legislative protection		
N/A (not a relevant action area for an offshore petroleum activity).		
Monitoring to support adaptive management		
N/A (not a relevant action area for an offshore petroleum activity).		
Research to assist management and understand threats		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
N/A (not a relevant action area for an offshore petroleum activity).		
Support and improve collaboration amongst stakeholders responsible for land management on Christmas Island		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for Asian dowitcher *Limnodromus semipalmatus* (Ref. 492)		
Primary conservation objective		
Ensure no further loss of habitat critical to the survival of Asian dowitcher throughout Australia (including habitat predicted to become habitat critical to the survival of the species in the future because of climate change).	✓	
Prevent further declines in Asian dowitcher subpopulations by working with relevant Range States to address threats in the East Asian-Australasian Flyway.		
Threats		
Habitat loss, fragmentation, and degradation–residential and commercial development		
Habitat loss, fragmentation, and degradation–industrial aquaculture		
Habitat loss, fragmentation, and degradation–downstream effects of large dams		
Climate change–sea level rise	✓	Section 8.4
Invasive species–invasion of mudflats and coastal saltmarshes by mangroves and cordgrass		
Exploitation–hunting		
Exploitation–fishing bycatch		
Pollution (Chronic and acute pollution)	✓	Sections 8.14, 8.15, 8.16 and 8.17
Conservation and management priorities		
Habitat loss, disturbance and modifications impacts:		
N/A (not a relevant action area for an offshore petroleum activity).		
Invasive species impacts:		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
N/A (not a relevant action area for an offshore petroleum activity).		
Climate change and severe weather impacts:		
Develop and implement a climate change adaptation plan for the species.		
Quantify and predict changes to important habitat because of climate change and identify potential shifts in the breeding and non-breeding distribution of the species		
Quantify the significance of sea level rise on Asian dowitcher feeding and roosting habitat within Australia.		
Hunting:		
N/A (not a relevant action area for an offshore petroleum activity).		
Stakeholder engagement/community engagement:		
N/A (not a relevant action area for an offshore petroleum activity).		
Survey and monitoring priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Information and research priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for Australian humpback dolphin *Sousa sahulensis* (Ref. 284)		
Primary conservation objective		
To manage anthropogenic threats to the Australian humpback dolphin so that the conservation status of the species can improve, and the species can be removed from the EPBC Act threatened species list.	✓	
Threats		
Fisheries interactions – Active fishing gear (i.e., bycatch and entanglement)		
Habitat loss and degradation - Climate variability and change (i.e. increased likelihood of extreme weather events and changes in oceanographic conditions [e.g. sea surface temperature, pH and salinity]).	✓	Section 8.4
Habitat loss and degradation - Coastal development		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Habitat loss and degradation - Marine pollution	✓	Sections 8.14, 8.15, 8.16 and 8.17
Queensland Shark Control Program		
Vessel interactions - Vessel strike	✓	Section 8.10
Disease		
Anthropogenic underwater noise - Industrial noise		
Anthropogenic underwater noise - Vessel noise	✓	Sections 8.6 and 8.7
Fisheries interactions (inactive fishing gear)		
Provisioning		
Anthropogenic noise – Seismic		
Information and research priorities		
General:		
Determine a national abundance estimate for Australian humpback dolphins.		
Improve the understanding (at national, regional, and local scales) of habitat use, dispersal, movement (temporary and permanent emigration) and genetic connectivity of Australian humpback dolphins throughout their range, understand related impacts and mitigate risks.		
Improve the understanding of how different types of coastal development and anthropogenic activity impacts the long-term population status of Australian humpback dolphins.		
At a spatial and temporal scale, identify and assess current, projected, and cumulative threats to Australian humpback dolphins throughout their range, understand related impacts and mitigate risks.		
Map cumulative threats and identify risk hotspots for the Australian humpback dolphin.		
Provide access to standardised national Australian humpback dolphin data in order to assess distribution, abundance and related data and underpin conservation and management. Data should be held in a centralised, accessible data repository and made widely available to interested stakeholders.		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Continue to identify, update and map Biologically Important Areas and Habitat Critical to the Survival for Australian humpback dolphins.		
Continue to implement and update National Guidelines and Policy Statements so that the current levels of legal and management protection for the Australian humpback dolphin are maintained or improved (see links to relevant implementation documents).		
Identify the source of scarring on individual Australian humpback dolphins to quantify the incidence of vessel strike, entanglement, predation, or non-conspecific socialising.		
Review current methods to mitigate threats to Australian humpback dolphins and apply an adaptive management approach.		
Fisheries interactions:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Underwater anthropogenic noise		
Ensure behavioural impacts are considered when developing and updating policy documents on the management of inshore dolphins and underwater anthropogenic noise		
Further understand what noise levels cause physiological damage and subsequent mortality to Australian humpback dolphins		
Further understand how the acoustic propagation of anthropogenic activities overlaps with Australian humpback hearing thresholds		
Further understand the impact noise pollution from increasing vessel traffic and coastal construction on dolphin distribution and behaviour.		
Vessel interactions		
Ensure all vessel strike incidents are reported in the National Ship Strike Database.	✓	Section 10.6.2
Ensure the risk of vessel strike on Australian humpback dolphins is considered when assessing actions that increase vessel traffic on areas Australian humpback dolphins occur and, if required, appropriate mitigation measures are implemented.	✓	Section 8.10
Health		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for Australian painted snipe *Rostratula australis* (Ref. 494)		
Threats		
Loss and degradation of wetlands		
Grazing (potential threat)		
Climate change (potential threat)	✓	Section 8.4
Predation by feral animals (potential threat)		
Coastal port and infrastructure development (potential threat)		
Shale oil mining (potential threat)		
Replacement of native wetland vegetation by invasive weeds (potential threat)		
Priority actions		
Habitat loss, disturbance and modification:		
N/A (not a relevant action area for an offshore petroleum activity).		
Invasive weeds:		
N/A (not a relevant action area for an offshore petroleum activity).		
Trampling, browsing or grazing		
N/A (not a relevant action area for an offshore petroleum activity).		
Animal Predation or Competition		
N/A (not a relevant action area for an offshore petroleum activity).		
Fire		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Information		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for Australian snubfin dolphin *Orcaella heinsohni* (Ref. 285)		
Primary conservation objective		
To manage anthropogenic threats to the Australian snubfin dolphin so that the conservation status of the species can improve, and the species can be removed from the EPBC Act threatened species list.	✓	
Threats		
Fisheries interactions – Active fishing gear (i.e., bycatch and entanglement)		
Habitat loss and degradation - Climate variability and change (i.e. increased likelihood of extreme weather events and changes in oceanographic conditions [e.g. sea surface temperature, pH and salinity]).	✓	Section 8.4
Habitat loss and degradation - Coastal development and infrastructure		
Habitat loss and degradation - Marine pollution	✓	Sections 8.14, 8.15, 8.16 and 8.17
Anthropogenic underwater noise - Industrial noise		
Anthropogenic underwater noise - Vessel noise	✓	Sections 8.6 and 8.7
Vessel interactions - Vessel strike	✓	Section 8.10
Disease		
Queensland Shark Control Program		
Fisheries interactions (inactive fishing gear)		
Provisioning		
Anthropogenic noise – Seismic		
Information and research priorities		
General:		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Determine a national abundance estimate for Australian snubfin dolphins.		
Improve the understanding (at national, regional, and local scales) of habitat use, dispersal, movement (temporary and permanent emigration) and genetic connectivity of Australian snubfin dolphins to aid conservation and management at appropriate geographic scales.		
Improve the understanding of how different types of coastal development and anthropogenic activity impacts the long-term population status of Australian snubfin dolphins.		
At a spatial and temporal scale, identify and assess current and projected threats to Australian snubfin dolphins throughout their range, understand related impacts and mitigate risks.		
Map cumulative threats and identify risk hotspots for the Australian snubfin dolphin.		
Provide access to standardised national Australian snubfin dolphin data in order to assess distribution, abundance and related data and underpin conservation and management. Data should be held in a centralised, accessible data repository and made widely available to interested stakeholders.		
Continue to identify, update and map Biologically Important Areas and Habitat Critical to the Survival for Australian snubfin dolphins.		
Continue to implement and update National Guidelines and Policy Statements so that the current levels of legal and management protection for the Australian snubfin dolphin are maintained or improved (see links to relevant implementation documents).		
Identify the source of scarring on individual Australian snubfin dolphins to quantify the incidence of vessel strike, entanglement, predation, or non-conspecific socialising.		
Review current methods to mitigate threats to Australian snubfin dolphins and apply an adaptive management approach.		
Fisheries interactions:		
N/A (not a relevant action area for an offshore petroleum activity).		
Underwater anthropogenic noise		
Ensure behavioural impacts are considered when developing and updating policy documents on the management of inshore dolphins and underwater anthropogenic noise.		
Further understand what noise levels cause physiological damage and subsequent mortality to snubfin dolphins.		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Further understand how the acoustic propagation of anthropogenic activities overlaps with snubfin dolphin hearing thresholds.		
Further understand the impact of noise pollution from increasing vessel traffic and coastal construction on dolphin distribution and behaviour.		
Vessel interactions		
Ensure all vessel strike incidents are reported in the National Ship Strike Database.	✓	Section 10.6.2
Ensure the risk of vessel strike on Australian snubfin dolphins is considered when assessing actions that increase vessel traffic on areas Australian snubfin dolphins occur and, if required, appropriate mitigation measures are implemented.	✓	Section 8.10
Health		
N/A (not a relevant action area for an offshore petroleum activity).		
Queensland Shark Control Program		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for common greenshank *Tringa nebularia* (Ref. 497)		
Primary conservation objective		
Minimise further loss of habitat critical to the survival of common greenshank throughout Australia (including habitat predicted to become habitat critical to the survival of the species in the future because of climate change).	✓	
Prevent further declines in common greenshank populations by working with relevant range states to address threats in the East Asian-Australasian Flyway.		
Threats		
Habitat loss, degradation, and fragmentation–residential and commercial development.		
Habitat loss, degradation, and fragmentation–industrial aquaculture.		
Habitat loss, degradation, and fragmentation–downstream effects of large dams		
Anthropogenic disturbance–disturbance at feeding and roosting sites		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Climate change–sea level rise	✓	Section 8.4
Invasive species–invasion of mudflats and coastal saltmarshes by mangroves and cordgrass		
Exploitation–hunting		
Exploitation–fishing bycatch		
Pollution–Chronic and acute pollution	✓	Sections 8.14, 8.15, 8.16 and 8.17
Actions		
Habitat loss, disturbance and modifications impacts:		
N/A (not a relevant action area for an offshore petroleum activity).		
Invasive species impacts		
N/A (not a relevant action area for an offshore petroleum activity).		
Climate change and severe weather impacts:		
Develop and implement a climate change adaptation plan for the species.		
Quantify and predict changes to important habitat because of climate change and identify potential shifts in the breeding and non-breeding distribution of the species.		
Quantify the significance of sea level rise on common greenshank feeding and roosting habitat within Australia.		
Human disturbance:		
N/A (not a relevant action area for an offshore petroleum activity).		
Hunting:		
N/A (not a relevant action area for an offshore petroleum activity).		
Stakeholder engagement/community engagement:		
N/A (not a relevant action area for an offshore petroleum activity).		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Survey and monitoring priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Information and research priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for dwarf sawfish *Pristis clavata* (Ref. 486)		
Threats		
Caught as bycatch in commercial and recreational net fishing		
Illegal, unreported and unregulated fishing		
Habitat degradation (potential threat)	✓	Section 8.4
Actions		
Fishing pressure:		
N/A (not a relevant action area for an offshore petroleum activity).		
Habitat loss, disturbance and modification:		
Identify populations and areas of high conservation priority		
Conservation Information:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for curlew sandpiper *Calidris ferruginea* (Ref. 498)		
Primary conservation objective		
Minimise further loss of habitat critical to the survival of curlew sandpiper throughout Australia (including habitat predicted to become habitat critical in the future because of climate change).	✓	
Prevent further declines in curlew sandpiper populations by working with relevant range states to address threats in the East Asian-Australasian Flyway.		
Threats		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Habitat loss, fragmentation, and degradation –residential and commercial development.		
Habitat loss, fragmentation, and degradation –industrial aquaculture.		
Habitat loss, fragmentation, and degradation –invasion of mudflats and coastal saltmarshes by mangroves and cordgrass		
Habitat loss, fragmentation, and degradation –downstream effects of large dams		
Anthropogenic disturbance–disturbance at feeding and roosting sites		
Climate change–increased frequency and length of droughts	✓	Section 8.4
Climate change–sea level rise	✓	Section 8.4
Climate change– in Arctic breeding areas		
Exploitation–hunting		
Pollution–chronic and acute pollution	✓	Sections 8.14, 8.15, 8.16 and 8.17
Actions		
Habitat loss, disturbance and modifications impacts:		
N/A (not a relevant action area for an offshore petroleum activity).		
Invasive species impacts		
N/A (not a relevant action area for an offshore petroleum activity).		
Climate change and severe weather impacts:		
Develop and implement a climate change adaptation plan for the species.		
Identify and protect inland wetlands and coastal drought refuges in Australia.		
Quantify and predict changes to important habitat because of climate change and identify potential shifts in the breeding and non-breeding distribution of the species.		
Quantify the significance of sea level rise on curlew sandpiper feeding and roosting habitat within Australia.		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Human disturbance:		
N/A (not a relevant action area for an offshore petroleum activity).		
Hunting		
N/A (not a relevant action area for an offshore petroleum activity).		
Stakeholder engagement/community engagement		
N/A (not a relevant action area for an offshore petroleum activity).		
Survey and monitoring priorities		
N/A (not a relevant action area for an offshore petroleum activity).		
Information and research priorities		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for far eastern curlew *Numenius madagascariensis* (Ref. 499)		
Primary conservation objective		
Minimise further loss of habitat critical to the survival of far eastern curlew throughout Australia (including habitat predicted to become habitat critical in the future because of climate change).	✓	
Prevent further declines in far eastern curlew populations within the Australian jurisdiction by working with relevant Range States to address threats in the East Asian Australasian Flyway.		
Threats		
Habitat loss, fragmentation, and degradation–residential and commercial development.		
Habitat loss, fragmentation, and degradation–industrial aquaculture.		
Habitat loss, fragmentation, and degradation–invasion of mudflats and coastal saltmarshes by mangroves and cordgrass		
Habitat loss, fragmentation, and degradation–downstream effects of large dams		
Anthropogenic disturbance–disturbance at feeding and roosting sites		
Climate change–sea level rise	✓	Section 8.4

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Climate change–at breeding locations		
Exploitation–hunting		
Exploitation–deliberate poisoning		
Exploitation–fisheries related mortality		
Pollution–chronic and acute pollution	✓	Sections 8.14, 8.15, 8.16 and 8.17
Actions		
Habitat loss, disturbance and modifications impacts:		
N/A (not a relevant action area for an offshore petroleum activity).		
Climate change and severe weather impacts:		
Develop and implement a climate change adaptation plan for the species.		
Quantify and predict changes to important habitat because of climate change and identify potential shifts in the breeding and non-breeding distribution of the species.		
Quantify the significance of sea level rise on far eastern curlew's feeding and roosting habitat within Australia.		
Hunting		
N/A (not a relevant action area for an offshore petroleum activity).		
Disturbance at feeding and roosting sites:		
N/A (not a relevant action area for an offshore petroleum activity).		
Stakeholder engagement/community engagement:		
N/A (not a relevant action area for an offshore petroleum activity).		
Survey and monitoring priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Information and research priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for fairy tern *Sternula nereis nereis* (Ref. 495)		
Threats		
Predation by introduced mammals		
Disturbance by humans, dogs and vehicles		
Increasing salinity in waters adjacent to fairy tern colonies		
Irregular water management		
Weed encroachment		
Oil spills, particularly in Victoria (potential threat)	✓	Sections 8.14, 8.15, 8.16 and 8.17
Regional priority actions		
Habitat Loss, Disturbance and Modification:		
Monitor the progress of recovery (using a variety of methods such as survey and banding programs, video surveillance of breeding colonies and maintaining a central breeding and sightings database), including the effectiveness of management actions and the need to adapt them if necessary		
Identify populations of high conservation priority.		
Manage any changes to hydrology that may result in changes to tide levels, increase salinity or pollution.		
Manage any disruptions to water flows in wetland areas such as the Coorong in South Australia.		
Introduce recreational codes of conduct and license commercial tourism operations utilising the subspecies' habitat.		
Animal Predation or Competition:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Local priority actions		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Habitat Loss, Disturbance and Modification:		
Use nest protection measures to safeguard nests from extreme weather/tides, including sandbagging and nest relocation		
Control access routes to suitably constrain public access to known sites on public and private land.		
Reduce disturbance during the breeding season from human recreation such as the use of off road vehicles and predation by domestic dogs, using signage and/ or fencing where appropriate. The use of signage can restrict access to the site as well as raise awareness of the sites ecological importance.		
Ensure appropriate oil-spill contingency plans are in place for the subspecies' breeding sites which are vulnerable to oil spills, such as the breeding colonies in Victoria.	✓	Sections 8.14, 8.15, 8.16 and 8.17
Weed Control:		
N/A (not a relevant action area for an offshore petroleum activity).		
Animal Predation:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for fin whale *Balaenoptera physalus* (Ref. 282)		
Threats		
Climate and oceanographic variability and change	✓	Section 8.4
Anthropogenic noise and acoustic disturbance	✓	Sections 8.6 and 8.7
Habitat degradation including coastal development, port expansion and aquaculture		
Pollution (persistent toxic pollutants)	✓	Sections 8.14, 8.15, 8.16 and 8.17
Fisheries catch, entanglement and bycatch		
Vessel strike	✓	Section 8.10

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Resource depletion due to fisheries (potential threat)		
Resumption of commercial whaling (potential threat)		
Actions		
Maintain and improve existing legal and management protection:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Understanding impacts of climate variability and change:		
Continue to meet Australia's international commitments to reduce greenhouse gas emissions and regulate the krill fishery in Antarctica	✓	Section 8.4
Assessing and addressing anthropogenic noise		
Once the spatial and temporal distribution (including biologically important areas) of fin whales is further defined, an assessment of the impacts of increasing anthropogenic noise (including seismic surveys, port expansion, and coastal development) should be undertaken on this species		
If required, additional management measures should be developed and implemented to ensure the ongoing recovery of fin whales		
Minimising vessel collisions		
Develop a national vessel strike strategy that investigates the risk of vessel strikes on fin whales and also identifies potential mitigation measures		
Ensure all vessel strike incidents are reported in the National Vessel Strike Database	✓	Section 10.6.2
Conservation Advice for golden bosun (*Phaethon lepturus fulvus)* (Ref. 500)		
Primary conservation objective		
By 2034, the golden bosun will maintain its AOO and EOO, and the population size will have increased towards the carrying capacity of the available habitat. The subspecies will be sustained in habitat where threats are managed effectively.		
Threats		
Exotic invasive species, problematic native species, pathogens and disease–disease (animal pathogens)		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Exotic invasive species, problematic native species, pathogens and disease–invasive species		
Climate change and severe weather– storms flooding and marine heatwaves	✓	Section 8.4
Human Disturbance–land clearing		
Actions		
Disease:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Domestic and invasive species:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Habitat loss, disturbance and modifications:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Climate change and severe weather:		
Trial revegetation techniques and artificial nests to improve nest site quality against heat stress and impacts from extreme storm events (see information and research priorities)		
Ex situ recovery actions:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Stakeholder engagement/community engagement:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Survey and monitoring priorities		
N/A (not a relevant action area for an offshore petroleum activity)..		
Information and research priorities:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Conservation Advice for greater sand plover *Charadrius leschenaultii* (Ref. 501)		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Primary conservation objective		
Minimise further loss of habitat critical to the survival of greater sand plover throughout Australia (including habitat predicted to become habitat critical in the future because of climate change).	✓	
Prevent further declines in greater sand plover populations within the Australian jurisdiction by working with relevant Range States to address threats in the East Asian Australasian Flyway.		
Threats		
Habitat loss, fragmentation, and degradation–residential and commercial development.		
Habitat loss, fragmentation, and degradation–industrial aquaculture.		
Habitat loss, fragmentation, and degradation–invasion of mudflats and coastal saltmarshes by mangroves and cordgrass		
Habitat loss, fragmentation, and degradation–downstream effects of large dams		
Anthropogenic disturbance–disturbance at feeding and roosting sites		
Climate change–sea level rise	✓	Section 8.4
Climate change–in breeding areas		
Exploitation–hunting		
Pollution–chronic and acute pollution	✓	Sections 8.14, 8.15, 8.16 and 8.17
Actions		
Habitat loss, disturbance and modifications impacts:		
N/A (not a relevant action area for an offshore petroleum activity).		
Climate change and severe weather impacts:		
Develop and implement a climate change adaptation plan for the species.		
Quantify and predict changes to important habitat because of climate change and identify potential shifts in the breeding and non-breeding distribution of the species.		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Quantify the significance of sea level rise on greater sand plover's feeding and roosting habitat within Australia.		
Hunting		
N/A (not a relevant action area for an offshore petroleum activity).		
Disturbance at feeding and roosting sites:		
N/A (not a relevant action area for an offshore petroleum activity).		
Stakeholder engagement/community engagement:		
N/A (not a relevant action area for an offshore petroleum activity).		
Survey and monitoring priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Information and research priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for green sawfish *Pristis zijsron* (Ref. 489)		
Threats		
Incidental capture as bycatch and byproduct in gillnet and trawl fisheries		
Illegal capture for fins and rostra		
Habitat degradation through coastal development		
Actions		
Habitat loss, disturbance and modification:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Information:		
N/A (not a relevant action area for an offshore petroleum activity).		
Improve understanding of species biology, ecology and threats:		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
N/A (not a relevant action area for an offshore petroleum activity).		
Improve, develop and implement threat abatement and mitigation measures:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for largetooth sawfish *Pristis pristis* (Ref. 490)		
Primary conservation objectives		
To prevent further decline of any largetooth sawfish subpopulations (e.g. population units that are isolated from others via reproductive philopatry)	✓	
Ensure the recovery of the largetooth sawfish across its Australian range.	✓	
Threats		
Climate change	✓	Section 8.4
Mortality in Australian commercial fisheries		
Habitat loss and degradation (water resource development, coastal development and alterations to river courses)		
Minor or poorly understood threats		
Recreational line fishing		
Queensland Shark Control Program		
Illegal, unreported and unregulated fishing		
International Fishing		
First Nations fishing		
Collection for display in public aquaria		
Pollution and mining operations		
Crocodile predation		
Foreign fleets in Australian waters (historic threat)		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Actions		
Commercial fisheries		
N/A (not a relevant action area for an offshore petroleum activity).		
Water resource development and alteration		
Ensure that proposed developments will not have a significant impact upon largetooth sawfish habitats, including recruitment or migration ability. Consider cumulative impacts of all current and proposed developments across the species' range. This may include limiting water abstraction where it is likely to adversely impact the species, especially during years with below-average rainfall/river-flow volume.		
Determine the effect of existing river and estuarine barriers to the movements of largetooth sawfish. Undertake an audit of existing barriers and, where possible, remove or modify barriers for the purpose of improving connectivity of largetooth sawfish habitat or alleviating threats to the species		
Ensure ecosystem and environmental monitoring, and modelling of freshwater environmental flows and water quality, is designed to answer key questions on sawfish habitat use, survival and recovery		
Climate change and severe weather impacts		
Foster resilience to climate change by protecting important habitats for all largetooth sawfish life stages and restoring habitats that may buffer against climate change impacts.		
Survey and monitoring		
N/A (not a relevant action area for an offshore petroleum activity).		
Information and research		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for leaf-scaled sea snake *Aipysurus foliosquama* (Ref. 451)		
Threats		
Degradation of reef habitat	✓	Sections 8.15, 8.16 and 8.17
Priority actions		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Habitat Loss, Disturbance and Modification:		
Identify remnant populations of high conservation priority.		
Monitor known populations to identify key threats.		
Ensure there is no disturbance in areas where the leaf-scaled sea snake occurs, excluding necessary actions to manage the conservation of the species.	✓	Sections 8.15, 8.16 and 8.17
Monitor changes to sea water temperatures and sea levels.		
Conservation Information:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Enable Recovery of Additional Populations:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Conservation Advice for leatherback turtle *Dermochelys coriacea* (Ref. 408)		
Threats		
Incidental capture in commercial fisheries		
Harvest of eggs and meat		
Ingestion of marine debris	✓	Section 8.13
Boat strike	✓	Section 8.10
Predation on eggs by wild dogs, pigs and monitor lizards		
Degradation of foraging areas	✓	Sections 8.15, 8.16 and 8.17
Changes to breeding sites		
Priority actions		
Habitat Loss, Disturbance and Modification:		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Identify and protect migratory corridors between nesting beaches and common foraging areas to facilitate colonization.		
Investigate formal conservation arrangements, such as the development of conservation agreements and covenants with the fishing community.		
Animal Predation:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Conservation Information		
N/A (not a relevant action area for an offshore petroleum activity)..		
Conservation Advice for little tern *Sternula albifrons* (Ref. 502)		
Primary conservation objective		
Retain breeding colonies across the species' range by managing threats to the extent possible, including by facilitating breeding site re-positioning if needed, and achieve a stable or increasing population trend in both subpopulations.		
Increase breeding success in existing breeding colonies in all range states through appropriate management of threats.		
Threats		
Anthropogenic disturbance–human disturbance at nesting sites (including offleash dogs).		
Anthropogenic disturbance–off-road vehicles		
Habitat loss and degradation–industrial and urban development		
Habitat loss and degradation–altered hydrological regimes		
Habitat loss and degradation–beach wrack harvesting		
Habitat loss and degradation–invasive weeds		
Predation–introduced species		
Predation–silver gulls and other native species		
Climate change–sea level rise	✓	Section 8.4

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Climate change–extreme natural events		
Hybridisation–fairy tern		
Actions		
Human disturbance at nesting sites and off-road vehicles:		
N/A (not a relevant action area for an offshore petroleum activity).		
Habitat loss and degradation:		
N/A (not a relevant action area for an offshore petroleum activity).		
Predation by introduced species:		
N/A (not a relevant action area for an offshore petroleum activity).		
Altered hydrological regimes and sea level rise:		
N/A (not a relevant action area for an offshore petroleum activity).		
Stakeholder engagement/community engagement:		
N/A (not a relevant action area for an offshore petroleum activity).		
Survey and monitoring priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Information and research priorities:		
Conservation Advice for Northern Siberian bar-tailed godwit (Yakutian bar-tailed Godwit) *Limosa lapponica menzbieri* (Ref. 503)		
Primary conservation objective		
Minimise further loss of habitat critical to the survival of Yakutian bar-tailed godwit throughout Australia (including habitat predicted to become habitat critical in the future because of climate change).	✓	
Prevent further declines in Yakutian bar-tailed godwit populations by working with relevant Range States to address threats in the East Asian-Australasian Flyway.		
Threats		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Habitat loss, fragmentation, and degradation–residential and commercial development		
Habitat loss, fragmentation, and degradation–industrial aquaculture		
Habitat loss, fragmentation, and degradation–invasion of mudflats and coastal saltmarshes by mangroves and cordgrass		
Anthropogenic disturbance–disturbance at feeding and roosting sites		
Climate change–sea level rise	✓	Section 8.4
Climate change–Arctic breeding areas		
Exploitation–hunting		
Pollution– chronic and acute pollution	✓	Sections 8.15, 8.16 and 8.17
Actions		
Habitat loss, disturbance and modifications impacts:		
N/A (not a relevant action area for an offshore petroleum activity).		
Invasive species impacts:		
N/A (not a relevant action area for an offshore petroleum activity).		
Climate change and severe weather impacts:		
Develop and implement a climate change adaptation plan for the species.		
Quantify and predict changes to important habitat because of climate change and identify potential shifts in the breeding and non-breeding distribution of the species.		
Quantify the significance of sea level rise on Yakutian bar-tailed godwit's feeding and roosting habitat within Australia.		
Human disturbance:		
N/A (not a relevant action area for an offshore petroleum activity).		
Hunting:		
N/A (not a relevant action area for an offshore petroleum activity).		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Stakeholder engagement/community engagement:		
N/A (not a relevant action area for an offshore petroleum activity).		
Survey and monitoring priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Information and research priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for red knot *Calidris canutus* (Ref. 504)		
Primary conservation objective		
Minimise further loss of habitat critical to the survival of red knot throughout Australia (including habitat predicted to become habitat critical in the future because of climate change).	✓	
Prevent further declines in red knot populations within the Australian jurisdiction by working with relevant Range States to address threats in the East Asian-Australasian Flyway.		
Threats		
Habitat loss, fragmentation, and degradation–residential and commercial development		
Habitat loss, fragmentation, and degradation–industrial aquaculture		
Habitat loss, fragmentation, and degradation–invasion of mudflats and coastal saltmarshes by mangroves and cordgrass		
Habitat loss, fragmentation, and degradation–downstream effects of large dams		
Anthropogenic disturbance–disturbance at feeding and roosting sites		
Climate change–sea level rise	✓	Section 8.4
Climate change–Arctic breeding areas		
Exploitation–hunting		
Pollution– chronic and acute pollution	✓	Sections 8.14, 8.15, 8.16 and 8.17

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Actions		
Habitat loss, disturbance and modifications impacts:		
N/A (not a relevant action area for an offshore petroleum activity).		
Climate change and severe weather impacts:		
Develop and implement a climate change adaptation plan for the species.		
Quantify and predict changes to important habitat because of climate change and identify potential shifts in the breeding and non-breeding distribution of the species.		
Quantify the significance of sea level rise on red knot's feeding and roosting habitat within Australia.		
Hunting:		
N/A (not a relevant action area for an offshore petroleum activity).		
Disturbance at feeding and roosting sites:		
N/A (not a relevant action area for an offshore petroleum activity).		
Stakeholder engagement/community engagement:		
N/A (not a relevant action area for an offshore petroleum activity).		
Survey and monitoring priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Information and research priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for red-tailed tropicbird (Indian Ocean) *Phaethon rubricauda westralis* (Ref. 505)		
Primary conservation objective		
A stable or increasing population trend within Australian territory is maintained to the extent that the subspecies is no longer eligible to be listed under the EPBC Act.	✓	
Threats		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Predation–egg and nestling predation by introduced species.		
Predation–nestling injury or death caused by ants.		
Climate change–climate driven change in resource availability	✓	Section 8.4
Climate change–extreme natural events		
Actions		
Nest predation by introduced species:		
N/A (not a relevant action area for an offshore petroleum activity).		
Nestling injury or death caused by ants:		
N/A (not a relevant action area for an offshore petroleum activity).		
Stakeholder engagement/community engagement:		
N/A (not a relevant action area for an offshore petroleum activity).		
Survey and monitoring priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Information and research priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for sei whale *Balaenoptera borealis* (Ref. 283)		
Threats		
Climate and oceanographic variability and change	✓	Section 8.4
Anthropogenic noise and acoustic disturbance	✓	Sections 8.6 and 8.7
Habitat degradation including pollution (increasing port expansion and coastal development)		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Pollution (persistent toxic pollutants)	✓	Sections 8.14, 8.15, 8.16 and 8.17
Vessel strike	✓	Section 8.10
Prey depletion due to fisheries (potential threat)		
Resumption of commercial whaling (potential threat)		
Actions		
Maintain and improve existing legal and management protection:		
N/A (not a relevant action area for an offshore petroleum activity)..		
Understanding impacts of climate variability and change:		
Continue to meet Australia's international commitments to reduce greenhouse gas emissions and regulate the krill fishery in Antarctica	✓	Section 8.4
Assessing and addressing anthropogenic noise		
Once the spatial and temporal distribution (including biologically important areas) of sei whales is further defined an assessment of the impacts of increasing anthropogenic noise (including from seismic surveys, port expansion, and coastal development) should be undertaken on this species		
If required, additional management measures should be developed and implemented to ensure the ongoing recovery of sei whales		
Minimising vessel collisions		
Develop a national vessel strike strategy that investigates the risk of vessel strikes on sei whales and also identifies potential mitigation measures.		
Ensure all vessel strike incidents are reported in the National Vessel Strike Database	✓	Section 10.6.2
Conservation Advice for sharp-tailed sandpiper *Calidris acuminata* (Ref. 506)		
Primary conservation objective		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Minimise further loss of habitat critical to the survival of sharp-tailed sandpiper throughout Australia (including habitat predicted to become habitat critical to survival in the future because of climate change).	✓	
Prevent further declines in sharp-tailed sandpiper populations by working with Range States to address threats in the East Asian - Australasian Flyway.		
Threats		
Habitat loss, degradation, and fragmentation–residential and commercial development.		
Habitat loss, degradation, and fragmentation–industrial aquaculture.		
Habitat loss, degradation, and fragmentation–clearing for large-scale agriculture.		
Habitat loss, degradation, and fragmentation– downstream effects of large dams.		
Climate change–increased frequency or length of droughts.	✓	Section 8.4
Climate change–sea level rise.	✓	Section 8.4
Invasive species–invasion of mudflats and coastal saltmarshes by mangroves and cordgrass.		
Pollution–chronic and acute pollution.	✓	Sections 8.14, 8.15, 8.16 and 8.17
Exploitation–hunting.		
Exploitation–fishing bycatch.		
Actions		
Habitat loss caused by residential, commercial, and aquaculture development:		
N/A (not a relevant action area for an offshore petroleum activity).		
Invasive species impacts:		
N/A (not a relevant action area for an offshore petroleum activity).		
Climate change and severe weather impacts:		
Develop and implement a climate change adaptation plan for the species.		

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Quantify and predict changes to important habitat because of climate change and identify potential shifts in the breeding and non-breeding distribution of the species.		
Quantify the significance of sea level rise on sharp-tailed sandpiper feeding and roosting habitat within Australia.		
Human disturbance:		
N/A (not a relevant action area for an offshore petroleum activity).		
Hunting:		
N/A (not a relevant action area for an offshore petroleum activity).		
Stakeholder engagement/community engagement:		
N/A (not a relevant action area for an offshore petroleum activity).		
Survey and monitoring priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Information and research priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for short-nosed sea snake *Aipysurus apraefrontalis* (Ref. 450)		
Threats		
Degradation of reef habitat	✓	Sections 8.15, 8.16 and 8.17
Priority actions		
Habitat Loss, Disturbance and Modification:		
Identify remnant populations of high conservation priority.		
Monitor known populations to identify key threats.		
Ensure there is no anthropogenic disturbance in areas where the short-nosed sea snake occurs, excluding necessary actions to manage the conservation of the species.	✓	Sections 8.15, 8.16 and 8.17

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Monitor changes to sea water temperatures and sea levels.		
Conservation Information:		
N/A (not a relevant action area for an offshore petroleum activity).		
Enable Recovery of Additional Populations:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for soft-plumaged petrel *Pterodroma Mollis* (Ref. 507)		
Threats		
Accidental introduction of predators (potential threat)		
Actions		
Habitat loss, disturbance and modification:		
N/A (not a relevant action area for an offshore petroleum activity).		
Predation:		
N/A (not a relevant action area for an offshore petroleum activity).		
Survey and monitoring priorities:		
N/A (not a relevant action area for an offshore petroleum activity).		
Conservation Advice for whale shark *Rhincodon typus* (Ref. 292)		
Threats		
Boat strike	✓	Section 8.10
Habitat disruption	✓	Sections 8.15, 8.16 and 8.17
Disturbance from domestic tourism operations		
Marine debris	✓	Section 8.13

Conservation Advice	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Climate change	✓	Section 8.4
Conservation actions		
Conservation and Management Actions:		
Minimise offshore developments and transit time of large vessels in areas close to marine features likely to correlate with whale shark aggregations (Ningaloo Reef, Christmas Island and the Coral Sea) and 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, DotE, 2014).	✓	Section 8.10
Management of all domestic tourism industry interactions with whale sharks in accordance with the Western Australian 'Whale Shark Management with particular reference to Ningaloo Reef' Wildlife Management Program No. 57.		
Continued advocacy of threat mitigation actions for whale sharks in international fora including, but not limited to, regional fishery management organisations.		
Support for the development of eco-tourism industries in areas where traditional hunting of whale sharks occurs.		
Survey and Monitoring Priorities		
N/A (not a relevant action area for an offshore petroleum activity).		
Information and Research Priorities		
Develop greater scientific certainty around migration, habitat use, emerging threats, and population trends in Australian waters.		
Assess the impacts of offshore installations and associated environmental changes (light spill, chronic noise, changed water temperature, localised nutrient levels) on whale sharks and mitigation options for these impacts.	✓	Sections 8.5, 8.6 and 8.7
Conduct further research into the impacts of boat strike on whale sharks to determine the significance of the threat. Consider possible mitigation actions (collision avoidance systems) if required.		
Assess environmental variables that determine whale shark presence. These can then be used to provide advice to shipping to help avoid boat strike (Lewison et al., 2015).		
Consider the implications of climate change on whale shark distribution in Australian waters (possibly through the Range Extension Database Mapping Project [REDMAP]).		

Threat Abatement Plan	Relevant to the environmental management of the petroleum activity	Section(s) requirement addressed in the EP
Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia's coasts and oceans (Ref. 407)		
Objectives		
Objective 1: Contribute to long-term prevention of the incidence of marine debris.	✓	
Objective 2: Understand the scale of impacts from marine plastic and microplastic on key species, ecological communities and locations.		
Objective 3: Remove existing marine debris.		
Objective 4: Monitor the quantities, origins, types and hazardous chemical contaminants of marine debris, and assess the effectiveness of management arrangements for reducing marine debris.		
Objective 5: Increase public understanding of the causes and impacts of harmful marine debris, including microplastic and hazardous chemical contaminants, to bring about behaviour change.		
Actions		
Action 1: Address objective 1.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action 2: Address objective 2.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action 3: Address objective 3.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action 4: Address objective 4.		
N/A (not a relevant action area for an offshore petroleum activity).		
Action 5: Address objective 5:		
N/A (not a relevant action area for an offshore petroleum activity).		

Appendix D Protected matters search report

Protected Matters - Print Map - January 22nd 2026

Operational Area

1

10 km
5 mi

Protected Matters - Print Map - January 22nd 2026

Habitat Critical to the Survival of flatback turtles

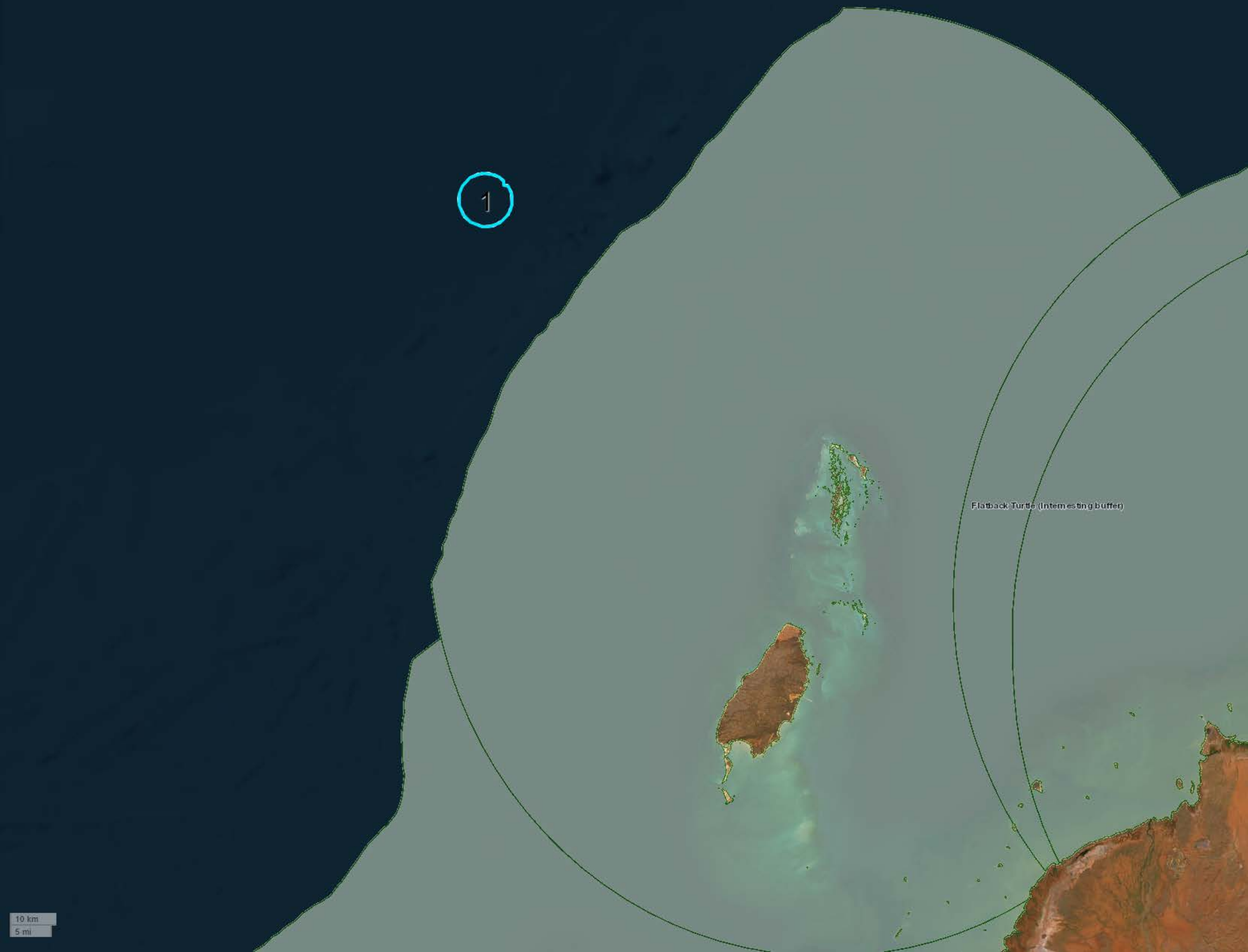
1

Flatback Turtle (Nesting)

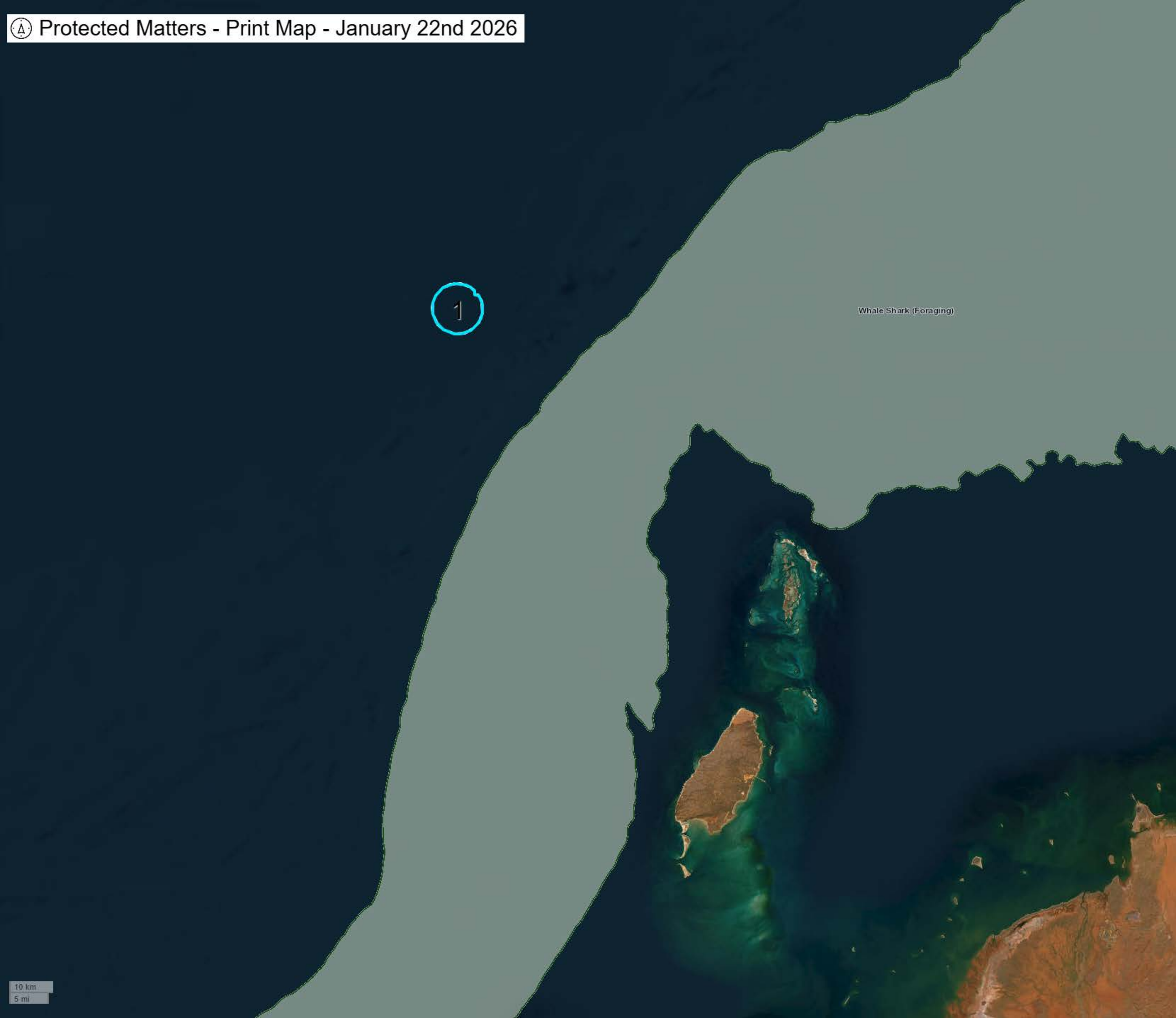
10 km
5 mi

Protected Matters - Print Map - January 22nd 2026

Flatback turtle internesting buffer BIA



Protected Matters - Print Map - January 22nd 2026



Protected Matters - Print Map - January 22nd 2026

Key Ecological Features

Exmouth Plateau

Ancient coastline at 125 m depth contour

1

Continental Slope Demersal Fish Communities

10 km
5 mi

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.

Report created: 22-Jan-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:	25
Listed Migratory Species:	43

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:	67
Whales and Other Cetaceans:	30
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	1

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:	22
Key Ecological Features (Marine):	2
Biologically Important Areas:	4
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Operational Area

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		
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
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	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
Phaethon lepturus fulvus Christmas Island White-tailed Tropicbird, Golden Bosunbird [26021]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phaethon rubricauda westralis		
Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat may occur within area
Sternula nereis nereis		
Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Migration route known to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
Orcaella heinsohni		
Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat may occur within area
Sousa sahulensis		
Australian Humpback Dolphin [87942]	Vulnerable	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	Species or species habitat known to occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Natator depressus		
Flatback Turtle [59257]	Vulnerable	Congregation or aggregation known to occur within area
SHARK		
Carcharias taurus (west coast population)		
Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat may occur within area
Carcharodon carcharias		
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Pristis clavata		
Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis		
Largetooth Sawfish, Freshwater Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Endangered	Species or species habitat may occur within area
Pristis zijsron		
Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sphyrna lewini		
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
null		
Balaenoptera omurai		
Omura's Whale [87136]		Species or species habitat likely to occur within area
Migratory Marine Birds		
Anous stolidus		
Common Noddy [825]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		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
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area
Phaethon rubricauda Red-tailed Tropicbird [994]		Species or species habitat may occur within area
Migratory Marine Species		
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		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	Species or species habitat 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	Migration route known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat likely to 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	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		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
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	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
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat likely to occur within area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Congregation or aggregation known to occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis Largetooth Sawfish, Freshwater Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Endangered	Species or species habitat may occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Tursiops aduncus (Arafura/Timor Sea populations)		
Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		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

Scientific Name	Threatened Category	Presence Text
Anous stolidus Common Noddy [825]		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
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		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
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
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
[Phaethon lepturus fulvus](#) Christmas Island White-tailed Tropicbird, Golden Bosunbird [26021]	Endangered	Species or species habitat may occur within area
[Phaethon rubricauda](#) Red-tailed Tropicbird [994]		Species or species habitat may occur within area
Fish		
[Acentronura larsonae](#) Helen's Pygmy Pipehorse [66186]		Species or species habitat may occur within area
[Bulbonaricus brauni](#) Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
[Campichthys tricarinatus](#) Three-keel Pipefish [66192]		Species or species habitat may occur within area
[Choeroichthys brachysoma](#) Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
[Choeroichthys latispinosus](#) Muiron Island Pipefish [66196]		Species or species habitat may occur within area
[Choeroichthys suillus](#) Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
[Corythoichthys flavofasciatus](#) Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area
[Cosmocampus banneri](#) Roughridge Pipefish [66206]		Species or species habitat may occur within area
[Doryrhamphus dactyliophorus](#) Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Doryrhamphus multiannulatus Many-banded Pipefish [66717]		Species or species habitat may occur within area
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Festucalex scalaris Ladder Pipefish [66216]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Haliichthys taeniophorus Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus spinosissimus Hedgehog Seahorse [66239]		Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area
Phoxocampus belcheri Black Rock Pipefish [66719]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		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
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Reptile		
Aipysurus duboisii Dubois' Sea Snake, Dubois' Seasnake, Reef Shallows Sea Snake [1116]		Species or species habitat may occur within area
Aipysurus laevis Olive Sea Snake, Olive-brown Sea Snake [1120]		Species or species habitat may occur within area
Aipysurus mosaicus as Aipysurus eydouxii Mosaic Sea Snake [87261]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		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

Scientific Name	Threatened Category	Presence Text
Ephalophis greyae as Ephalophis greyi Mangrove Sea Snake [93738]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Hydrophis czeblukovi Fine-spined Sea Snake [59233]		Species or species habitat may occur within area
Hydrophis elegans Elegant Sea Snake, Bar-bellied Sea Snake [1104]		Species or species habitat may occur within area
Hydrophis kingii as Disteira kingii Spectacled Sea Snake [93511]		Species or species habitat may occur within area
Hydrophis major as Disteira major Olive-headed Sea Snake [93512]		Species or species habitat may occur within area
Hydrophis ornatus Spotted Sea Snake, Ornate Reef Sea Snake [1111]		Species or species habitat may occur within area
Hydrophis peronii as Acalyptophis peronii Horned Sea Snake [93509]		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
Hydrophis stokesii as Astrotia stokesii Stokes' Sea Snake [93510]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Congregation or aggregation known to occur within area

Whales and Other Cetaceans		[Resource Information]
Current Scientific Name	Status	Type of Presence

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	Species or species habitat 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	Migration route known to occur within area
[Balaenoptera omurai](#) Omura's Whale [87136]		Species or species habitat likely to occur within area
[Balaenoptera physalus](#) Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
[Delphinus delphis](#) Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may 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
[Grampus griseus](#) Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
[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
[Lagenodelphis hosei](#) Fraser's Dolphin, Sarawak Dolphin [41]		Species or species habitat may occur within area
[Megaptera novaeangliae](#) Humpback Whale [38]		Species or species habitat known to occur within area
[Mesoplodon densirostris](#) Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
[Orcaella heinsohni](#) Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat may occur within area
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat may 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
[Sousa sahulensis](#) Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
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
Steno bredanensis Rough-toothed Dolphin [30]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat may occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat may 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

Habitat Critical to the Survival of Marine Turtles		[Resource Information]
Scientific Name	Behaviour	Presence
All year (Jun - Aug)		
Natator depressus Flatback Turtle [59257]	Nesting	Known to occur

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Deep Water Northwest Shelf 2D Seismic Survey	2007/3260		Completed
Gorgon Gas Development	2003/1294		Post-Approval
Controlled action			
Construct and operate LNG & domestic gas plant including onshore and offshore facilities - Wheatston	2008/4469	Controlled Action	Post-Approval
Develop Jansz-Io deepwater gas field in Permit Areas WA-18-R, WA-25-R and WA-26-	2005/2184	Controlled Action	Post-Approval
Equus Gas Fields Development Project, Carnarvon Basin	2012/6301	Controlled Action	Completed
Gorgon Gas Development 4th Train Proposal	2011/5942	Controlled Action	Post-Approval
Pluto Gas Project	2005/2258	Controlled Action	Completed
Pluto Gas Project Including Site B	2006/2968	Controlled Action	Post-Approval
Not controlled action			
Project Highclere Geophysical Survey	2021/9023	Not Controlled Action	Completed
Wheatstone 3D seismic survey, 70km north of Barrow Island	2004/1761	Not Controlled Action	Completed
Not controlled action (particular manner)			
"Leanne" offshore 3D seismic exploration, WA-356-P	2005/1938	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey in Permit Areas WA-15-R, WA-18-R, WA-205-P, WA-253-P, WA-267-P and WA-268-P	2003/1271	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic survey	2006/2715	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Aperio 3D Marine Seismic Survey, WA	2012/6648	Not Controlled Action (Particular Manner)	Post-Approval
Balnaves Condensate Field Development	2011/6188	Not Controlled Action (Particular Manner)	Post-Approval
CGGVERITAS 2010 2D Seismic Survey	2010/5714	Not Controlled Action (Particular Manner)	Post-Approval
Draeck 3D Marine Seismic Survey, WA-205-P	2006/3067	Not Controlled Action (Particular Manner)	Post-Approval
Drilling 35-40 offshore exploration wells in deep water	2008/4461	Not Controlled Action (Particular Manner)	Post-Approval
Harmony 3D Marine Seismic Survey	2012/6699	Not Controlled Action (Particular Manner)	Post-Approval
Julimar Brunello Gas Development Project	2011/5936	Not Controlled Action (Particular Manner)	Post-Approval
Osprey and Dionysus Marine Seismic Survey	2011/6215	Not Controlled Action (Particular Manner)	Post-Approval
Westralia SPAN Marine Seismic Survey, WA & NT	2012/6463	Not Controlled Action (Particular Manner)	Post-Approval

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
Ancient coastline at 125 m depth contour	North-west
Continental Slope Demersal Fish Communities	North-west

Biologically Important Areas		[Resource Information]
Scientific Name	Behaviour	Presence
Marine Turtles		
Natator depressus		
Flatback Turtle [59257]	Internesting buffer	Known to occur
Seabirds		
Ardenna pacifica		
Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Sharks		
Rhincodon typus		
Whale Shark [66680]	Foraging	Known to occur
Whales		
Balaenoptera musculus brevicauda		
Pygmy Blue Whale [81317]	Migration	Known to occur

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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Protected Matters - Print Map - January 22nd 2026

Environment that may be affected

1

2

3

4

5

6

9

11

13

14

15

Indian Ocean

Port Hedland

Roebourne

Wittenoom

Tom Price

Newman

50 km
30 mi

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.

Report created: 22-Jan-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:	1
National Heritage Places:	1
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	3
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	55
Listed Migratory Species:	66

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:	13
Commonwealth Heritage Places:	2
Listed Marine Species:	104
Whales and Other Cetaceans:	31
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	5
Habitat Critical to the Survival of Marine Turtles:	4

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	25
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	174
Key Ecological Features (Marine):	5
Biologically Important Areas:	36
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties		[Resource Information]
Name	State	Legal Status
The Ningaloo Coast	WA	Declared property

National Heritage Places		[Resource Information]
Name	State	Legal Status
Natural		
The Ningaloo Coast	WA	Listed place

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)

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		
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

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
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	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
Malurus leucopterus edouardi White-winged Fairy-wren (Barrow Island), Barrow Island Black-and-white Fairy-wren [26194]	Vulnerable	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Papasula abbotti Abbott's Booby [59297]	Endangered	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Critically Endangered	Species or species habitat may occur within area
Phaethon lepturus fulvus Christmas Island White-tailed Tropicbird, Golden Bosunbird [26021]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phaethon rubricauda westralis Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area
CRUSTACEAN		
Kumonga exleyi Cape Range Remipede [86875]	Vulnerable	Species or species habitat likely to occur within area
FISH		
Milyeringa justitia Barrow Cave Gudgeon [86867]	Endangered	Species or species habitat known to occur within area
Milyeringa veritas Cape Range Cave Gudgeon, Blind Gudgeon [66676]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Ophisternon candidum		
Blind Cave Eel [66678]	Vulnerable	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	Migration route known to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Bettongia lesueur Barrow and Boodie Islands subspecies		
Boodie, Burrowing Bettong (Barrow and Boodie Islands) [88021]	Vulnerable	Species or species habitat known to occur within area
Dasyurus hallucatus		
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
Eubalaena australis		
Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Isoodon auratus barrowensis		
Golden Bandicoot (Barrow Island) [66666]	Vulnerable	Species or species habitat known to occur within area
Lagorchestes conspicillatus conspicillatus		
Spectacled Hare-wallaby (Barrow Island) [66661]	Vulnerable	Species or species habitat known to occur within area
Lagorchestes hirsutus Central Australian subspecies		
Mala, Rufous Hare-Wallaby (Central Australia) [88019]	Endangered	Translocated population known to occur within area

Scientific Name	Threatened Category	Presence Text
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat known to occur within area
Osphranter robustus isabellinus Barrow Island Wallaroo, Barrow Island Euro [89262]	Vulnerable	Species or species habitat likely to occur within area
Petrogale lateralis lateralis Black-flanked Rock-wallaby, Moororong, Black-footed Rock Wallaby [66647]	Endangered	Species or species habitat known to occur within area
Rhinonicteris aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat known to occur within area
Sousa sahulensis Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Aipysurus apraefrontalis Short-nosed Sea Snake, Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat known to occur within area
Aipysurus foliosquama Leaf-scaled Sea Snake, Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Ctenotus zastictus Hamelin Ctenotus [25570]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
SHARK		
Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Congregation or aggregation known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis Largetooth Sawfish, Freshwater Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Endangered	Species or species habitat likely to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat known to occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
null		
Balaenoptera omurai Omura's Whale [87136]		Species or species habitat likely to occur within area
Migratory Marine Birds		

Scientific Name	Threatened Category	Presence Text
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
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat 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
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Onychoprion anaethetus Bridled Tern [82845]		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 likely to occur within area

Scientific Name	Threatened Category	Presence Text
Sterna dougallii Roseate Tern [817]		Breeding known to occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Migratory Marine Species		
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to 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	Migration route known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	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

Scientific Name	Threatened Category	Presence Text
Carcharias taurus Grey Nurse Shark [64469]		Congregation or aggregation known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat may 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]		Breeding known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Megaptera novaeangliae Humpback Whale [38]		Breeding 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	Breeding known to occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis Largetooth Sawfish, Freshwater Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Endangered	Species or species habitat likely to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Sousa sahulensis as Sousa chinensis		
Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area
Tursiops aduncus (Arafura/Timor Sea populations)		
Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
Migratory Terrestrial Species		
Hirundo rustica		
Barn Swallow [662]		Species or species habitat may occur within area
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may 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
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 veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may 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
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely 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
Department of Climate Change, Energy, the Environment and Water	
Learmonth Air Weapons Range Facility [CHL_105551]	WA
Ningaloo Marine Area - Commonwealth Waters [CHL_105548]	WA
Department of Defence	
Exmouth Area A VLF Transmitter Station [DD_0083]	WA

Commonwealth Land Name	State
Exmouth Area B Admin and HF Transmitter [DD_0082]	WA
Exmouth RAAF Radar Site - Vlaming Head [DD_0974]	WA
Learmonth Air Weapons Range [DD_0961]	WA
Learmonth RAAF base [AGPR4413]	WA
Learmonth RAAF base [AGPR4416]	WA
Learmonth RAAF base [AGPR4467]	WA
Learmonth RAAF base [AGPR4418]	WA
Learmonth RAAF base [AGPR4419]	WA
Learmonth RAAF base [AGPR4417]	WA
Learmonth RAAF base [AGPR4466]	WA

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Natural		
Learmonth Air Weapons Range Facility	WA	Listed place
Ningaloo Marine Area - Commonwealth Waters	WA	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]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Ardenna pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding 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 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 may occur within area overfly marine area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		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 veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Chroicocephalus novaehollandiae as Larus novaehollandiae		
Silver Gull [82326]		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
Glareola maldivarum		
Oriental Pratincole [840]		Species or species habitat may occur within area overfly marine area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundo rustica		
Barn Swallow [662]		Species or species habitat may occur within area overfly marine area
Hydroprogne caspia as Sterna caspia		
Caspian Tern [808]		Breeding known to occur within 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
Macronectes giganteus		
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may 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
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Breeding known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Papasula abbotti Abbott's Booby [59297]	Endangered	Species or species habitat may occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area
Phaethon lepturus fulvus Christmas Island White-tailed Tropicbird, Golden Bosunbird [26021]	Endangered	Species or species habitat may occur within area
Phaethon rubricauda Red-tailed Tropicbird [994]		Species or species habitat likely to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Rostratula australis as Rostratula benghalensis (sensu lato)		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
Sterna dougallii		
Roseate Tern [817]		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
Thalassarche carteri		
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalasseus bengalensis as Sterna bengalensis		
Lesser Crested Tern [66546]		Breeding known to occur within area
Thalasseus bergii as Sterna bergii		
Greater Crested Tern [83000]		Breeding known to occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area
Fish		
Acentronura larsonae		
Helen's Pygmy Pipehorse [66186]		Species or species habitat may occur within area
Bulbonaricus brauni		
Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
Campichthys tricarinatus		
Three-keel Pipefish [66192]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
Choeroichthys latispinosus Muiron Island Pipefish [66196]		Species or species habitat may occur within area
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
Corythoichthys flavofasciatus Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area
Cosmocampus banneri Roughridge Pipefish [66206]		Species or species habitat may occur within area
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Doryrhamphus multiannulatus Many-banded Pipefish [66717]		Species or species habitat may occur within area
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Festucalex scalaris Ladder Pipefish [66216]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Haliichthys taeniophorus Ribboned Pipehorse, Ribboned Seadragon [66226]		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 angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus spinosissimus Hedgehog Seahorse [66239]		Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area
Phoxocampus belcheri Black Rock Pipefish [66719]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		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
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
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Mammal		
Dugong dugon Dugong [28]		Breeding known to occur within area
Reptile		

Scientific Name	Threatened Category	Presence Text
Aipysurus apraefrontalis Short-nosed Sea Snake, Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat known to occur within area
Aipysurus duboisii Dubois' Sea Snake, Dubois' Seasnake, Reef Shallows Sea Snake [1116]		Species or species habitat may occur within area
Aipysurus foliosquama Leaf-scaled Sea Snake, Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area
Aipysurus laevis Olive Sea Snake, Olive-brown Sea Snake [1120]		Species or species habitat may occur within area
Aipysurus mosaicus as Aipysurus eydouxii Mosaic Sea Snake [87261]		Species or species habitat may occur within area
Aipysurus tenuis Brown-lined Sea Snake, Mjoberg's Sea Snake [1121]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Emydocephalus annulatus Eastern Turtle-headed Sea Snake [1125]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Ephalophis greyae as Ephalophis greyi Mangrove Sea Snake [93738]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Hydrophis czeblukovi Fine-spined Sea Snake [59233]		Species or species habitat may occur within area
Hydrophis elegans Elegant Sea Snake, Bar-bellied Sea Snake [1104]		Species or species habitat may occur within area
Hydrophis kingii as Disteira kingii Spectacled Sea Snake [93511]		Species or species habitat may occur within area
Hydrophis macdowelli as Hydrophis mcdowelli MacDowell's Sea Snake, Small-headed Sea Snake, [75601]		Species or species habitat may occur within area
Hydrophis major as Disteira major Olive-headed Sea Snake [93512]		Species or species habitat may occur within area
Hydrophis ornatus Spotted Sea Snake, Ornate Reef Sea Snake [1111]		Species or species habitat may occur within area
Hydrophis peronii as Acalyptophis peronii Horned Sea Snake [93509]		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
Hydrophis stokesii as Astrotia stokesii Stokes' Sea Snake [93510]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding 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	Migration route known to occur within area
[Balaenoptera omurai](#) Omura's Whale [87136]		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
[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 likely to occur within area
[Feresa attenuata](#) Pygmy Killer Whale [61]		Species or species habitat may 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
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
Lagenodelphis hosei Fraser's Dolphin, Sarawak Dolphin [41]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Breeding known to occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may 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

Current Scientific Name	Status	Type of Presence
[Pseudorca crassidens](#) False Killer Whale [48]		Species or species habitat likely to occur within area
[Sousa sahulensis](#) Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known 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
[Steno bredanensis](#) Rough-toothed Dolphin [30]		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 aduncus (Arafura/Timor Sea populations)](#) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known 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

Australian Marine Parks	[Resource Information]
Park Name	Zone & IUCN Categories
Gascoyne	Habitat Protection Zone (IUCN IV)

Park Name	Zone & IUCN Categories
Gascoyne	Multiple Use Zone (IUCN VI)
Montebello	Multiple Use Zone (IUCN VI)
Ningaloo	National Park Zone (IUCN II)
Ningaloo	Recreational Use Zone (IUCN IV)

Habitat Critical to the Survival of Marine Turtles		[Resource Information]
Scientific Name	Behaviour	Presence
All year (Jun - Aug)		
Natator depressus		
Flatback Turtle [59257]	Nesting	Known to occur
Nov-Feb		
Caretta caretta		
Loggerhead Turtle [1763]	Nesting	Known to occur
Oct - Feb		
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Nesting	Known to occur
Oct - Mar		
Chelonia mydas		
Green Turtle [1765]	Nesting	Known to occur

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Airlie Island	Nature Reserve	WA
Barrow Island	Nature Reserve	WA
Barrow Island	Marine Park	WA
Barrow Island	Marine Management Area	WA
Bessieres Island	Nature Reserve	WA
Boodie, Double Middle Islands	Nature Reserve	WA
Bundegi Coastal Park	5(1)(h) Reserve	WA
Cape Range	National Park	WA

Protected Area Name	Reserve Type	State
Cape Range (South)	National Park	WA
Jurabi Coastal Park	5(1)(h) Reserve	WA
Locker Island	Nature Reserve	WA
Lowendal Islands	Nature Reserve	WA
Montebello Islands	Conservation Park	WA
Montebello Islands	Marine Park	WA
Montebello Islands	Conservation Park	WA
Muiron Islands	Nature Reserve	WA
Muiron Islands	Marine Management Area	WA
Ningaloo	Marine Park	WA
Nyingguulu (Ningaloo) Coastal Reserve	5(1)(h) Reserve	WA
Round Island	Nature Reserve	WA
Serrurier Island	Nature Reserve	WA
Thevenard Island	Nature Reserve	WA
Thevenard Island	Nature Reserve	WA
Unnamed WA40322	5(1)(h) Reserve	WA
Unnamed WA44665	5(1)(h) Reserve	WA

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
3D Seismic Survey in the Carnarvon Bsin on the North West Shelf	2002/778		Completed
Babylon 3D Marine Seismic Survey, Commonwealth Waters, nr Exmouth WA	2013/7081		Completed
Browse to North West Shelf Development, Indian Ocean, WA	2018/8319		Approval
DAVROS MC 3D marine seismic survey northwaet of Dampier, WA	2013/7092		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Deep Water Northwest Shelf 2D Seismic Survey	2007/3260		Completed
Gorgon Gas Development	2003/1294		Post-Approval
Ningaloo Lighthouse Development, 17km north west Exmouth, Western Australia	2020/8693		Post-Approval
Project Highclere Cable Lay and Operation	2022/09203		Completed
Action clearly unacceptable			
Highlands 3D Marine Seismic Survey	2012/6680	Action Clearly Unacceptable	Completed
Controlled action			
'Van Gogh' Petroleum Field Development	2007/3213	Controlled Action	Post-Approval
Construct and operate LNG & domestic gas plant including onshore and offshore facilities - Wheatston	2008/4469	Controlled Action	Post-Approval
Construction and operation of a Solar Salt Project, SW Onslow, WA	2016/7793	Controlled Action	Assessment Approach
Develop Jansz-Io deepwater gas field in Permit Areas WA-18-R, WA-25-R and WA-26-	2005/2184	Controlled Action	Post-Approval
Development of Browse Basin Gas Fields (Upstream)	2008/4111	Controlled Action	Completed
Development of Coniston/Novara fields within the Exmouth Sub-basin	2011/5995	Controlled Action	Post-Approval
Development of Stybarrow petroleum field incl drilling and facility installation	2004/1469	Controlled Action	Post-Approval
Echo-Yodel Production Wells	2000/11	Controlled Action	Post-Approval
Enfield full field development	2001/257	Controlled Action	Post-Approval
Equus Gas Fields Development Project, Carnarvon Basin	2012/6301	Controlled Action	Completed
Gorgon Gas Development 4th Train Proposal	2011/5942	Controlled Action	Post-Approval
Gorgon Gas Revised Development	2008/4178	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Greater Enfield (Vincent) Development	2005/2110	Controlled Action	Post-Approval
Greater Gorgon Development - Optical Fibre Cable, Mainland to Barrow Island	2005/2141	Controlled Action	Completed
Light Crude Oil Production	2001/365	Controlled Action	Post-Approval
Pluto Gas Project	2005/2258	Controlled Action	Completed
Pluto Gas Project Including Site B	2006/2968	Controlled Action	Post-Approval
Pyrenees Oil Fields Development	2005/2034	Controlled Action	Post-Approval
Simpson Development	2000/59	Controlled Action	Completed
Simpson Oil Field Development	2001/227	Controlled Action	Post-Approval
The Scarborough Project - FLNG & assoc subsea infrastructure, Carnarvon Basin	2013/6811	Controlled Action	Post-Approval
Vincent Appraisal Well	2000/22	Controlled Action	Post-Approval
Yardie Creek Road Realignment Project	2021/8967	Controlled Action	Assessment Approach
Not controlled action			
'Goodwyn A' Low Pressure Train Project	2003/914	Not Controlled Action	Completed
'Van Gogh' Oil Appraisal Drilling Program, Exploration Permit Area WA-155-P(1)	2006/3148	Not Controlled Action	Completed
Airlie Island soil and groundwater investigations, Exmouth Gulf, offshore Pilbara coast	2014/7250	Not Controlled Action	Completed
Baniyas-1 Exploration Well, EP-424, near Onslow	2007/3282	Not Controlled Action	Completed
Barrow Island 2D Seismic survey	2006/2667	Not Controlled Action	Completed
Bollinger 2D Seismic Survey 200km North of North West Cape WA	2004/1868	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Bultaco-2, Laverda-2, Laverda-3 and Montesa-2 Appraisal Wells	2000/103	Not Controlled Action	Completed
Carnarvon 3D Marine Seismic Survey	2004/1890	Not Controlled Action	Completed
Cazadores 2D seismic survey	2004/1720	Not Controlled Action	Completed
Construction and operation of an unmanned sea platform and connecting pipeline to Varanus Island for	2004/1703	Not Controlled Action	Completed
Controlled Source Electromagnetic Survey	2007/3262	Not Controlled Action	Completed
Development of Halyard Field off the west coast of WA	2010/5611	Not Controlled Action	Completed
Differential Global Positioning System (DGPS)	2001/445	Not Controlled Action	Completed
Eagle-1 Exploration Drilling, North West Shelf, WA	2019/8578	Not Controlled Action	Completed
Echo A Development WA-23-L, WA-24-L	2005/2042	Not Controlled Action	Completed
Exploration drilling well WA-155-P(1)	2003/971	Not Controlled Action	Completed
Exploration of appraisal wells	2006/3065	Not Controlled Action	Completed
Exploration Well (Taunton-2)	2002/731	Not Controlled Action	Completed
Exploration Well in Permit Area WA-155-P(1)	2002/759	Not Controlled Action	Completed
Exploratory drilling in permit area WA-225-P	2001/490	Not Controlled Action	Completed
Extension of Simpson Oil Platforms & Wells	2002/685	Not Controlled Action	Completed
HCA05X Macedon Experimental Survey	2004/1926	Not Controlled Action	Completed
Hess Exploration Drilling Programme	2007/3566	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Infill Production Well (Griffin-9)	2001/417	Not Controlled Action	Completed
Jansz-2 and 3 Appraisal Wells	2002/754	Not Controlled Action	Completed
Klammer 2D Seismic Survey	2002/868	Not Controlled Action	Completed
Maia-Gaea Exploration wells	2000/17	Not Controlled Action	Completed
Montesa-1 and Bultaco-1 Exploration Wells	2000/102	Not Controlled Action	Completed
North Rankin B gas compression facility	2005/2500	Not Controlled Action	Completed
Pipeline System Modifications Project	2000/3	Not Controlled Action	Completed
Project Highclere Geophysical Survey	2021/9023	Not Controlled Action	Completed
Searipple gas and condensate field development	2000/89	Not Controlled Action	Completed
Spool Base Facility	2001/263	Not Controlled Action	Completed
Subsea Gas Pipeline From Stybarrow Field to Griffin Venture Gas Export Pipeline	2005/2033	Not Controlled Action	Completed
sub-sea tieback of Perseus field wells	2004/1326	Not Controlled Action	Completed
Telstra North Rankin Spur Fibre Optic Cable	2016/7836	Not Controlled Action	Completed
Thevenard Island Retirement Project	2015/7423	Not Controlled Action	Completed
To construct and operate an offshore submarine fibre optic cable, WA	2014/7373	Not Controlled Action	Completed
Wanda Offshore Research Project, 80 km north-east of Exmouth, WA	2018/8293	Not Controlled Action	Completed
Western Flank Gas Development	2005/2464	Not Controlled Action	Completed
Wheatstone 3D seismic survey, 70km north of Barrow Island	2004/1761	Not Controlled Action	Completed
Not controlled action (particular manner)			

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
'Kate' 3D marine seismic survey, exploration permits WA-320-P and WA-345-P, 60km	2005/2037	Not Controlled Action (Particular Manner)	Post-Approval
'Tourmaline' 2D marine seismic survey, permit areas WA-323-P, WA-330-P and WA-32	2005/2282	Not Controlled Action (Particular Manner)	Post-Approval
"Leanne" offshore 3D seismic exploration, WA-356-P	2005/1938	Not Controlled Action (Particular Manner)	Post-Approval
2D and 3D seismic surveys	2005/2151	Not Controlled Action (Particular Manner)	Post-Approval
2D marine seismic survey	2012/6296	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey	2008/4281	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey (WA-482-P, WA-363-P), WA	2013/6761	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey in Permit Areas WA-15-R, WA-18-R, WA-205-P, WA-253-P, WA-267-P and WA-268-P	2003/1271	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey in WA 457-P & WA 458-P, North West Shelf, offshore WA	2013/6862	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey over petroleum title WA-268-P	2007/3458	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Surveys - Contos CT-13 & Supertubes CT-13, offshore WA	2013/6901	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic survey	2006/2715	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
3D Seismic Survey, WA	2008/4428	Not Controlled Action (Particular Manner)	Post-Approval
Apache Northwest Shelf Van Gogh Field Appraisal Drilling Program	2007/3495	Not Controlled Action (Particular Manner)	Post-Approval
Aperio 3D Marine Seismic Survey, WA	2012/6648	Not Controlled Action (Particular Manner)	Post-Approval
Artemis-1 Drilling Program (WA-360-P)	2010/5432	Not Controlled Action (Particular Manner)	Post-Approval
Balnaves Condensate Field Development	2011/6188	Not Controlled Action (Particular Manner)	Post-Approval
Bonaventure 3D seismic survey	2006/2514	Not Controlled Action (Particular Manner)	Post-Approval
Cable Seismic Exploration Permit areas WA-323-P and WA-330-P	2008/4227	Not Controlled Action (Particular Manner)	Post-Approval
CGGVERITAS 2010 2D Seismic Survey	2010/5714	Not Controlled Action (Particular Manner)	Post-Approval
Charon 3D Marine Seismic Survey	2007/3477	Not Controlled Action (Particular Manner)	Post-Approval
Consturction & operation of the Varanus Island kitchen & mess cyclone refuge building, compression p	2013/6952	Not Controlled Action (Particular Manner)	Post-Approval
Coverack Marine Seismic Survey	2001/399	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Cue Seismic Survey within WA-359-P, WA-361-P and WA-360-P	2007/3647	Not Controlled Action (Particular Manner)	Post-Approval
CVG 3D Marine Seismic Survey	2012/6654	Not Controlled Action (Particular Manner)	Post-Approval
Deep Water Drilling Program	2010/5532	Not Controlled Action (Particular Manner)	Post-Approval
Demeter 3D Seismic Survey, off Dampier, WA	2002/900	Not Controlled Action (Particular Manner)	Post-Approval
Draeck 3D Marine Seismic Survey, WA-205-P	2006/3067	Not Controlled Action (Particular Manner)	Post-Approval
Drilling 35-40 offshore exploration wells in deep water	2008/4461	Not Controlled Action (Particular Manner)	Post-Approval
Earthworks for kitchen/mess, cyclone refuge building & Compression Plant, Varanus Island	2013/6900	Not Controlled Action (Particular Manner)	Post-Approval
Eendracht Multi-Client 3D Marine Seismic Survey	2009/4749	Not Controlled Action (Particular Manner)	Post-Approval
Enfield M3 & Vincent 4D Marine Seismic Surveys	2008/3981	Not Controlled Action (Particular Manner)	Completed
Enfield M3 4D, Vincent 4D & 4D Line Test Marine Seismic Surveys	2008/4122	Not Controlled Action (Particular Manner)	Post-Approval
Enfield M4 4D Marine Seismic Survey	2008/4558	Not Controlled Action (Particular Manner)	Post-Approval
Enfield oilfield 3D Seismic Survey	2006/3132	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Exmouth West 2D Marine Seismic Survey	2008/4132	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of Zeus-1 well	2008/4351	Not Controlled Action (Particular Manner)	Post-Approval
Foxhound 3D Non-Exclusive Marine Seismic Survey	2009/4703	Not Controlled Action (Particular Manner)	Post-Approval
Gazelle 3D Marine Seismic Survey in WA-399-P and WA-42-L	2010/5570	Not Controlled Action (Particular Manner)	Post-Approval
Geco Eagle 3D Marine Seismic Survey	2008/3958	Not Controlled Action (Particular Manner)	Post-Approval
Glencoe 3D Marine Seismic Survey WA-390-P	2007/3684	Not Controlled Action (Particular Manner)	Post-Approval
Greater Western Flank Phase 1 gas Development	2011/5980	Not Controlled Action (Particular Manner)	Post-Approval
Grimalkin 3D Seismic Survey	2008/4523	Not Controlled Action (Particular Manner)	Post-Approval
Guacamole 2D Marine Seismic Survey	2008/4381	Not Controlled Action (Particular Manner)	Post-Approval
Harmony 3D Marine Seismic Survey	2012/6699	Not Controlled Action (Particular Manner)	Post-Approval
Harpy 1 exploration well	2001/183	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Honeycombs MC3D Marine Seismic Survey	2012/6368	Not Controlled Action (Particular Manner)	Post-Approval
Huzzas MC3D Marine Seismic Survey (HZ-13) Carnarvon Basin, offshore WA	2013/7003	Not Controlled Action (Particular Manner)	Post-Approval
Huzzas phase 2 marine seismic survey, Exmouth Plateau, Northern Carnarvon Basin, WA	2013/7093	Not Controlled Action (Particular Manner)	Post-Approval
John Ross & Rosella Off Bottom Cable Seismic Exploration Program	2008/3966	Not Controlled Action (Particular Manner)	Post-Approval
Judo Marine 3D Seismic Survey within and adjacent to WA-412-P	2009/4801	Not Controlled Action (Particular Manner)	Post-Approval
Judo Marine 3D Seismic Survey within and adjacent to WA-412-P	2008/4630	Not Controlled Action (Particular Manner)	Post-Approval
Julimar Brunello Gas Development Project	2011/5936	Not Controlled Action (Particular Manner)	Post-Approval
Klimt 2D Marine Seismic Survey	2007/3856	Not Controlled Action (Particular Manner)	Post-Approval
Laverda 3D Marine Seismic Survey and Vincent M1 4D Marine Seismic Survey	2010/5415	Not Controlled Action (Particular Manner)	Post-Approval
Leopard 2D marine seismic survey	2005/2290	Not Controlled Action (Particular Manner)	Post-Approval
Lion 2D Marine Seismic Survey	2007/3777	Not Controlled Action (Particular Manner)	Post-Approval
Macedon Gas Field Development	2008/4605	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Marine reconnaissance survey	2008/4466	Not Controlled Action (Particular Manner)	Post-Approval
Moosehead 2D seismic survey within permit WA-192-P	2005/2167	Not Controlled Action (Particular Manner)	Post-Approval
Munmorah 2D seismic survey within permits WA-308/9-P	2003/970	Not Controlled Action (Particular Manner)	Post-Approval
Ocean Bottom Cable Seismic Program, WA-264-P	2007/3844	Not Controlled Action (Particular Manner)	Post-Approval
Ocean Bottom Cable Seismic Survey	2005/2017	Not Controlled Action (Particular Manner)	Post-Approval
Offshore Canning Multi Client 2D Marine Seismic Survey	2010/5393	Not Controlled Action (Particular Manner)	Post-Approval
Orcus 3D Marine Seismic Survey in WA-450-P	2010/5723	Not Controlled Action (Particular Manner)	Post-Approval
Osprey and Dionysus Marine Seismic Survey	2011/6215	Not Controlled Action (Particular Manner)	Post-Approval
Palta-1 exploration well in Petroleum Permit Area WA-384-P	2011/5871	Not Controlled Action (Particular Manner)	Post-Approval
Pomodoro 3D Marine Seismic Survey in WA-426-P and WA-427-P	2010/5472	Not Controlled Action (Particular Manner)	Post-Approval
Pyrenees 4D Marine Seismic Monitor Survey, HCA12A	2012/6579	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Pyrenees-Macedon 3D marine seismic survey	2005/2325	Not Controlled Action (Particular Manner)	Post-Approval
Rose 3D Seismic Program	2008/4239	Not Controlled Action (Particular Manner)	Post-Approval
Rydal-1 Petroleum Exploration Well, WA	2012/6522	Not Controlled Action (Particular Manner)	Post-Approval
Salsa 3D Marine Seismic Survey	2010/5629	Not Controlled Action (Particular Manner)	Post-Approval
Santos Winchester three dimensional seismic survey - WA-323-P & WA-330-P	2011/6107	Not Controlled Action (Particular Manner)	Post-Approval
Skorpion Marine Seismic Survey WA	2001/416	Not Controlled Action (Particular Manner)	Post-Approval
Sovereign 3D Marine Seismic Survey	2011/5861	Not Controlled Action (Particular Manner)	Post-Approval
Stybarrow 4D Marine Seismic Survey	2011/5810	Not Controlled Action (Particular Manner)	Post-Approval
Stybarrow Baseline 4D marine seismic survey	2008/4530	Not Controlled Action (Particular Manner)	Post-Approval
Tidepole Maz 3D Seismic Survey Campaign	2007/3706	Not Controlled Action (Particular Manner)	Post-Approval
Tortilla 2D Seismic Survey, WA	2011/6110	Not Controlled Action (Particular Manner)	Post-Approval
Triton 3D Marine Seismic Survey, WA-2-R and WA-3-R	2006/2609	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Undertake a three dimensional marine seismic survey	2010/5715	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5679	Not Controlled Action (Particular Manner)	Post-Approval
Vincent M1 and Enfield M5 4D Marine Seismic Survey	2010/5720	Not Controlled Action (Particular Manner)	Post-Approval
Warramunga Non-Inclusive 3D Seismic Survey	2008/4553	Not Controlled Action (Particular Manner)	Post-Approval
West Anchor 3D Marine Seismic Survey	2008/4507	Not Controlled Action (Particular Manner)	Post-Approval
West Panaeus 3D seismic survey	2006/3141	Not Controlled Action (Particular Manner)	Post-Approval
Westralia SPAN Marine Seismic Survey, WA & NT	2012/6463	Not Controlled Action (Particular Manner)	Post-Approval
Wheatstone 3D MAZ Marine Seismic Survey	2011/6058	Not Controlled Action (Particular Manner)	Post-Approval
Wheatstone Iago Appraisal Well Drilling	2007/3941	Not Controlled Action (Particular Manner)	Post-Approval
Wheatstone Iago Appraisal Well Drilling	2008/4134	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
3D Marine Seismic Survey in the offshore northwest Carnarvon Basin	2011/6175	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
3D Seismic Survey	2008/4219	Referral Decision	Completed
Bianchi 3D Marine Seismic Survey, Carnavon Basin, WA	2013/7078	Referral Decision	Completed
CVG 3D Marine Seismic Survey	2012/6270	Referral Decision	Completed
Enfield 4D Marine Seismic Surveys, Production Permit WA-28-L	2005/2370	Referral Decision	Completed
Rose 3D Seismic acquisition survey	2008/4220	Referral Decision	Completed
Stybarrow Baseline 4D Marine Seismic Survey (Permit Areas WA-255-P, WA-32-L, WA-	2008/4165	Referral Decision	Completed
Two Dimensional Transition Zone Seismic Survey - TP/7 (R1)	2010/5507	Referral Decision	Completed
Varanus Island Compression Project	2012/6698	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
Ancient coastline at 125 m depth contour	North-west
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	North-west
Commonwealth waters adjacent to Ningaloo Reef	North-west
Continental Slope Demersal Fish Communities	North-west
Exmouth Plateau	North-west

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence
Dugong		
Dugong dugon Dugong [28]	Breeding	Known to occur
Dugong dugon Dugong [28]	Calving	Known to occur

Scientific Name	Behaviour	Presence
Dugong dugon Dugong [28]	Foraging (high density seagrass beds)	Known to occur
Dugong dugon Dugong [28]	Nursing	Known to occur
Marine Turtles		
Caretta caretta Loggerhead Turtle [1763]	Internesting buffer	Known to occur
Caretta caretta Loggerhead Turtle [1763]	Nesting	Known to occur
Chelonia mydas Green Turtle [1765]	Aggregation	Known to occur
Chelonia mydas Green Turtle [1765]	Basking	Known to occur
Chelonia mydas Green Turtle [1765]	Foraging	Known to occur
Chelonia mydas Green Turtle [1765]	Internesting	Known to occur
Chelonia mydas Green Turtle [1765]	Internesting buffer	Known to occur
Chelonia mydas Green Turtle [1765]	Mating	Known to occur
Chelonia mydas Green Turtle [1765]	Nesting	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Foraging	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Internesting	Known to occur

Scientific Name	Behaviour	Presence
Eretmochelys imbricata Hawksbill Turtle [1766]	Internesting buffer	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Mating	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Nesting	Known to occur
Natator depressus Flatback Turtle [59257]	Aggregation	Known to occur
Natator depressus Flatback Turtle [59257]	Foraging	Known to occur
Natator depressus Flatback Turtle [59257]	Internesting	Known to occur
Natator depressus Flatback Turtle [59257]	Internesting buffer	Known to occur
Natator depressus Flatback Turtle [59257]	Mating	Known to occur
Natator depressus Flatback Turtle [59257]	Nesting	Known to occur
Seabirds		
Ardenna pacifica Wedge-tailed Shearwater [84292]	Breeding	Known to occur
Sterna dougallii Roseate Tern [817]	Breeding	Known to occur
Sternula nereis Fairy Tern [82949]	Breeding	Known to occur
Thalasseus bengalensis Lesser Crested Tern [66546]	Breeding	Known to occur
Sharks		
Rhincodon typus Whale Shark [66680]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Rhincodon typus Whale Shark [66680]	Foraging (high density prey)	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Migration	Known to occur
Eubalaena australis Southern Right Whale [40]	Migration	
Eubalaena australis Southern Right Whale [40]	Reproduction	
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Resting	Known to occur

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 E Consultation summary

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1.1 Regulation 25(1)(a)—each Commonwealth, State or Northern Territory agency or authority to which the activities to be carried out under the EP, or the revision of the EP, may be relevant

1.1.1 Commonwealth Departments or Agencies

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Australian Communications and Media Authority (ACMA)	26/11/2025	002734	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage. CAPL noted that no known submarine telecommunication cables within the OA, however the Darwin-Jakarta-Singapore Cable intersects the Hydrocarbon EMBA.	No objection or claim raised		
	05/12/2025	002791	Email	CAPL received reply from ACMA. ACMA recommended confirming whether any other submarine cables may be impacted by the proposed activities and suggested engaging with Vocus and Telstra. ACMA noted that further consultation is not required for this EP.	ACMA raised submarine cables and suggested engaging with Vocus and Telstra.	**Claims have merit**: The feedback raised by ACMA is considered relevant.	No change made to the EP. The presence of submarine cables is described in Section 5.4.7. Vocus and Telstra were engaged with for this activity.
	10/12/2025	002792	Email	CAPL thanked ACMA for their input and acknowledged the recommendations received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with ACMA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• ACMA has not raised any objections or claims relating to the activity. However, ACMA did raise the presence of submarine cables and potential Relevant Persons in the area. The presence of submarine cables is captured within the EP, and the suggested Relevant Persons were already engaged with. • CAPL has provided ACMA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Australian Fisheries Management Authority (AFMA)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	27/11/2025	002748	Email	AFMA emailed CAPL confirming AFMA had no direct comments on the GS3 drilling EP and would like to be included in future consultation. AFMA encouraged CAPL to consult with: • Commonwealth Fisheries Association (CFA) • Tuna Australia • Australian Southern Bluefin Tuna Fishery Association	AFMA requested inclusion in future consultation for the EP. AFMA raised CFA, Tuna Australia and ASBTIA as potential Relevant Persons.	**Claims have merit:** As a Relevant Person, the request for ongoing engagement is considered fair and reasonable. CAPL acknowledge the potential Relevant Persons AFMA has raised for consideration.	Table 10-5 was updated to include ongoing engagement with AFMA. CAPL has engaged with CFA, Tuna Australia and ASBTIA.
	03/12/2025	002757	Email	CAPL responded to AFMA, thanking them for confirming that they had no direct comments on this	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				EP and noted that they will continue to include them in future consultations. CAPL thanked AFMA and acknowledged the input received.			
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with AFMA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • AFMA has not raised any objections or claims relating to the activity. AFMA requested ongoing engagement and raised potential Relevant Persons. Ongoing engagement is captured within the EP, and the raised potential Relevant Persons were engaged with. • CAPL has provided ACMA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Australian Hydrographic Office (AHO)	26/11/2025	002741	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage. CAPL noted that they are aware of notification requirements to AHO.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	27/11/2025	002750	Email	CAPL received automated email confirming AHO had received email regarding GS3 Drilling EP.	No objection or claim raised		
	28/11/2025	002789	Email	The AHO confirmed that they have no concerns with any of the activities proposed. AHO raised the requirement to provide notification of commencement.	AHO raised the requirement to provide notification of commencement.	**Claim has merit:** The requirement to notify AHO on activity commencement is relevant and applicable to this activity.	No change made to the EP. The requirement to notify AHO is captured in Table 10-5 of the EP.
	24/12/2025	002793	Email	CAPL thanked AHO for their input and noted notification requirements.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with AHO on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • AHO has not raised any objections or claims relating to the activity. AHO raised notification requirements, which are captured within the EP. • CAPL has provided AHO with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Australian Maritime Safety Authority (AMSA)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025-22/12/2025	002842	Email	CAPL sent follow up email requesting feedback on the EP information. AMSA responded to CAPL's email and requested CAPL refer to AMSA's response provided to CAPL on the 17 December 2025 regarding the GS3 Pipeline Licence Application. AMSA attached a copy of their response to this application.	No objection or claim raised		
	08/01/2026	002840	Email	CAPL responded to AMSA's email to seek clarification on feedback to confirm if feedback provided by AMSA for the Gorgon Stage 3 Pipeline Licence also applies for this EP.	No objection or claim raised		
	15/01/2026-21/01/2026	002876	Email	AMSA responded and confirming response sent from NavSafety team. The NavSafety Team emailed CAPL and attached their response to the GS3 Pipeline Licence Application. In this response, AMSA raised vessel traffic in the region, notification requirements (including notification to AHO) and the requirement for anti-collision measures.	AMSA raised vessel traffic, notification requirements and the need for anti-collision measures.	**Claims have merit:** Vessel traffic, notification requirements and vessel collision controls are relevant and applicable to this activity.	Vessel traffic and the presence of shipping fairways is outlined in Section 5.4.4 of the EP. The physical presence of vessels is risk assessed in Section 8.1 and includes control measures relevant to this aspect. Section 8.1.2.2 'ALARP decision context justification' revised to include statement regarding receipt of one claim. No change to previous decision context (i.e. still Decision Context A). 'External context' (within 'Demonstration of

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
							acceptability') for Section 8.1.3 has been updated with a summary of claim and response. Notification requirements to AMSA and AHO are included in Table 10-5 of the EP. Vessel collision controls are standard within CAPL EPs, are already included within the EP. CAPL thanked AMSA and acknowledged the input received (Record ID: 002888)
	21/01/2026	002888	Email	CAPL thanked AMSA for their response and acknowledged input.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with AMSA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • AMSA has not raised any objections or claims relating to the activity. AMSA provided feedback regarding notification requirements, vessel traffic, control measures and the risk of vessel collision. These requirements are captured within the EP in Table 10-5 and Section 8.1. • CAPL has provided AMSA with sufficient information and a reasonable period in			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Clean Energy Regulator (CER)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	26/11/2025	002788	Email	CER replied and noted no specific comments on the EP. CER however note reporting obligations under NGER Act.	CER raised reporting requirements under the NGER Act.	**Claim has merit:** CAPL acknowledge the advice from CER and the relevance of both the NGER and Safeguard Mechanism schemes.	The requirements relating to GHG emissions reporting have been incorporated into the NGER and Safeguard Mechanism control measure in Section 8.4.
	02/12/2025	002756	Email	CAPL thanked CER for their response and acknowledged the input received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with CER on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • CER has not raised any objections or claims relating to the activity. CER raised the			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				obligations under the NGER Act, which are addressed within the EP. • CAPL has provided CER with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Department of Agriculture, Fisheries and Forestry (DAFF)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DAFF on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • DAFF has not raised any objections or claims relating to the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL has provided DAFF with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Department of Climate Change, Energy, the Environment and Water (DCCEEW) – Underwater heritage	26/11/2025	002743	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage. CAPL provided DCCEEW with additional information in regard to AMPs, emergency scenarios and notifications.	No objection or claim raised		
	17/12/2025	002804	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002833	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DCCEEW on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • DCCEEW has not raised any objections or claims relating to the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL has provided DCCEEW with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
DCCEEW - Director of National Parks (DNP)	26/11/2025	002742	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage. CAPL provided DNP with additional information in regard to AMPs, emergency scenarios and notifications.	No objection or claim raised		
	17/12/2025	002798	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	24/12/2025-05/01/2026	002898	Email	DNP responded and thanked CAPL for the opportunity to comment. DNP noted that as planned activities do not overlap AMPs, no authorisation requirements are required from the DNP. DNP raised the following for consideration: • NOPSEMA and Park Australia's 'Petroleum activities and Australian Marine Parks' guidance note • The North-west Network of Marine Parks Management Plan 2018 • DNP notification requirements. CAPL thanked them for their response and acknowledged the input received.	DNP raised the following: • Guidance note and management plan for consideration • DNP notification requirements.	**Claims have merit:** The advice provided by DNP is relevant and applicable to the EP.	No change made to the EP. The raised guidance note and management plan have been considered during EP development. The relevant marine parks and their values are already included and considered as a receptor within the EP (Section 5.5.1). The notification requirements in a spill event are included in Section 10.4.2. CAPL provided a response to DNP and

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
							thanked them for their advice.
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DNP on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • DNP has not raised any objections or claims relating to the activity. DNP raised guidance note and AMP management plan for consideration and noted DNP notification requirements. These requirements are addressed within the EP. • CAPL has provided DNP with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Department of Defence (DoD)	26/11/2025	002738	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage. CAPL provided DoD with additional information in regard to unexploded ordnance, North West Exercise Area and restricted airspace, Notices to Mariners and pre-start notification.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	17/12/2025	002801	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002835	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DoD on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • DoD has not raised any objections or claims relating to the activity. • CAPL has provided DoD with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

1.1.2 State Departments or Agencies

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Department of Biodiversity, Conservation and Attractions (DBCA)	26/11/2025	002739	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage. CAPL provided DBCA with additional information in regard to State Marine Parks and Spill Response Preparedness.	No objection or claim raised		
	17/12/2025	002803	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002834	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	20/01/2026	002883	Email	DBCA replied, and noted the proximity of the activity to: • Conservation significant species • Barrow Island Marine Park (M 10), Marine Management Area (M 11), and Nature Reserve (Reserve No. 11648). DBCA has advised the need for comprehensive baseline monitoring and robust oil spill response preparedness. In the event of a hydrocarbon release, DBCA request the DBCA Pilbara regional office be notified. DBCA raised DoT's web content regarding marine pollution and the Offshore Petroleum Industry Guidance Note of July 2020 'Marine Oil Pollution: Response and Consultation Arrangements' for consideration.	DBCA raised several factors for consideration, including: • Conservation significant species, • Marine parks, • oil spill response preparedness • spill notification • marine pollution web content and guidance note.	**Claims have merit:** The factors raised for consideration are relevant to the activity.	Listed threatened or migratory species and State Marine Parks within the EMBA are identified within Section 5.3.3 and 5.5.2 respectively of the EP. Oil spill preparedness and response is covered in the Consolidated OPEP, and operational and scientific monitoring is covered in the OSMP. Table 10-5 was updated to include notification to DBCA Pilbara regional office in the event of an unplanned release. CAPL acknowledge the information provided by DBCA. The 'Marine Oil Pollution: Response and Consultation Arrangements' Guidance Note is considered within the EP.

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
							CAPL thanked DBCA for their advice (Record ID: 002890)
	20/01/2026	002890	Email	CAPL thanked DBCA for their feedback and acknowledged the input received.	No objection or claim raised		
	22/01/2026	002893	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DBCA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • DBCA has not raised any objections or claims relating to the activity. DBCA raised multiple factors for consideration, including oil spill response preparedness, spill notification, marine pollution and guidance sources. These requirements are addressed within the EP. • CAPL has provided DBCA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Department of Energy and Economic	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Diversification (DEED)							
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DEED on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • DEED has not raised any objections or claims relating to the activity. • CAPL has provided DEED with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Department of Primary Industries and Regional Development	26/11/2025	002736	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
(WA DPIRD): Fisheries				CAPL provided DPIRD with additional information in regard to fishing in the region, impacts to fisheries, cumulative impacts, biosecurity measures, consultation and risk mitigation.			
	17/12/2025	002799	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002830	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DPIRD on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • DPIRD has not raised any objections or claims relating to the activity. • CAPL has provided DPIRD with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Department of Transport and Major	26/11/2025	002744	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Infrastructure (DTMI) *Formerly Department of Transport (DoT)*				activities and provided an information sheet and a link to CAPLs consultation webpage. CAPL provided DTMI with additional information in alignment with the DoT Offshore Petroleum Industry 'Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements (July 2020)', including information regarding spill scenarios.			
	17/12/2025	002764	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002832	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	08/01/2026	002856	Email	DTMI replied to confirm receipt of email and advised lack of capacity to respond. CAPL thanked DTMI for confirming no capacity to review EP and noted that CAPL will keep DTMI informed of future consultations.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DTMI on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • DTMI has not raised any objections or claims relating to the activity. • CAPL has provided DTMI with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Department of Water and Environmental Regulation (DWER)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DWER on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • DWER has not raised any objections or claims relating to the activity. • CAPL has provided DWER with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Environmental Protection Authority (EPA)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	27/11/2025	002749	Email	EPA emailed CAPL confirming that they had received 2 emails from CAPL regarding the GS3 drilling EP. EPA requested CAPL to confirm if there are any differences in the emails. CAPL replied and apologised for the duplication and confirmed the duplicated email can be disregarded.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with EPA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • EPA has not raised any objections or claims relating to the activity. • CAPL has provided EPA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				any feedback provided in the future (Section 10.3.4.1).			
Pilbara Ports Authority	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Pilbara Ports Authority on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Pilbara Ports Authority has not raised any objections or claims relating to the activity. • CAPL has provided Pilbara Ports Authority with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

1.2 Regulation 25(1)(b) - Department of the responsible State Minister

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Department of Mines, Petroleum and Exploration (DMPE)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with DMPE on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • DMPE has not raised any objections or claims relating to the activity. • CAPL has provided DMPE with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

1.3 Regulation 25(1)(d)— Person or organisation whose functions, interests, or activities may be affected by the petroleum activity

1.3.1 First Nations people and/or representative bodies

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Buurabalayji Thalanyji Aboriginal Corporation (BTAC)	17/06/2025	002339	Email	CAPL emailed BTAC to request their feedback on another EP. CAPL provided a slide deck including the 2025 EP schedule, including the Gorgon Stage 3 EP consultation later in 2025. CAPL are keen to work out the best way forward for BTAC to be engaged and consulted on EPs.	No objection or claim raised		
	25/09/2025	002590	Email	CAPL provided BTAC with the September "Bulletin," outlining CAPL ongoing Environmental Plans (EP). This included an overview of this EP. The Bulletin provides a detailed overview of proposed activities, including descriptions, location maps, timing, potential impacts, and the schedule for formal consultation. CAPL encouraged BTAC to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	24/10/2025	002659	Email	CAPL followed up on the September Bulletin and expressed interest in discussing the GS3 project. CAPL requested a time to meet and discuss the relevant projects before the end of the year. No response was received.	No objection or claim raised		
	30/10/2025	002697	Face-to-face	CAPL met with BTAC in relation to other matters and reminded BTAC that CAPL had provided several attempts at consultation on another EP but had not yet had a response. BTAC advised CAPL that they were establishing a working group and process for consultation and that they would be in touch to advise.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				CAPL reiterated offer that they are happy to come and present to the working group on any of their EP's.			
	07/11/2025	002706	Email	CAPL provided an update on CAPL EP progress and followed up the Bulletin with BTAC to discuss any of the information provided.	No objection or claim raised		
	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	05/12/2025	002809	Email	CAPL notified BTAC on the recent GS3 Final Investment Decision.	No objection or claim raised		
	12/12/2025	002857	Email	CAPL shared 2025 Highlights and 2026 Look Ahead email with BTAC, which included request to arrange regular meetings with representatives to provide information on upcoming CAPL activities and EPs.	No objection or claim		
	17/12/2025	002817	Email	CAPL provided BTAC with the December Bulletin outlining CAPL ongoing EPs. This included an overview of this EP. CAPL encouraged BTAC to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	14/01/2026	002859	Email	CAPL followed up on 2025 Highlights and 2026 Look Ahead email shared with BTAC. CAPL requested feedback on how BTAC would like CAPL to deliver training opportunities, consultation on	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				environment plans and next steps for priority protection area plans. CAPL requested to meet with BTAC to discuss these matters.			
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL provided a briefing on the activity ahead of formal consultation period on 26 November 2025 advising that BTAC had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL has also included access to NOPSEMA's consultation guideline, which describes their right to request information not to be published. • CAPL provided BTAC with the Bulletin newsletter on 25 September 2025 and 17 December 2025, providing further information on the activity and the opportunity for further briefings. • CAPL has met with BTAC face-to-face as well as maintaining contact through email exchanges. • CAPL has informed BTAC that they may request information provided during consultation not to be published (Regulation 25(4)) during consultation co-design, in opening consultation emails and activity information sheets. CAPL has also previously provided BTAC with a copy of NOPSEMA's consultation guideline, which further describes their right to request information not to be published. • BTAC has not raised any objections or claims relating to the activity. • CAPL executed an engagement plan / funding agreement in April 2024 which confirmed acceptance of cost recovery for BTAC to participate in consultation as well as other activities.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL has provided BTAC the opportunity to provide feedback and CAPL has presented sufficient information in accordance with Section 7.6 of the EP on the activity, including the activity description, EMBA, potential impacts and risks and control measures to enable an informed assessment by BTAC. BTAC had a period of over 8 weeks for consultation, which CAPL assessed to be a reasonable period to allow BTAC to identify the effect of the proposed activity on their functions, interests or activities, and to provide any objections or claims as set out in Section 7.7 of the EP. CAPL will continue to engage BTAC as part of its ongoing consultation for environment plans, including progressing cultural mapping, as outlined in Section 10.3.4.1 of the EP.			
Mardathoonera Cultural Heritage Pty Ltd (MCH)	11/03/2025	002332	Face-to-face	CAPL met with MCH to consult on upcoming activities, including 2025 EP consultation schedule. CAPL provided MCH with a presentation on upcoming activities ahead of formal launch of EP Consultation, including planning for Gorgon Stage 3.	No objection or claim raised		
	01/10/2025	002570	Email	CAPL provided MCH with the September "Bulletin," outlining CAPL ongoing EPs. This included an overview of this EP. The Bulletin provides a detailed overview of proposed activities, including descriptions, location maps, timing, potential impacts, and the schedule for formal consultation. CAPL encouraged MCH to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	26/11/2025	002746	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	17/12/2025	002824	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	17/12/2025	002823	Email	CAPL provided MCH with the December Bulletin outlining CAPL ongoing EPs. This included an overview of this EP. CAPL encouraged MCH to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	08/01/2026	002838	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	22/01/2026	002894	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL provided a briefing on the activity ahead of formal consultation period on 26 November 2025 advising that MCH had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL has also included access to NOPSEMA's consultation guideline, which describes their right to request information not to be published. • CAPL provided MCH with the Bulletin newsletter on 1 October 2025 and 17 December 2025, providing further information on the activity and the opportunity for further briefings. • MCH has previously communicated cultural values or features to CAPL through consultation. As requested on 4 December 2025 during consultation for another EP, CAPL has captured information confidentially within the Sensitive Information Report.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• MCH has not raised any objections or claims relating to the activity. • CAPL has informed MCH that they may request information provided during consultation not to be published (Regulation 25(4)) in opening consultation emails and activity information sheets. CAPL has also previously provided MCH with a copy of NOPSEMA's consultation guideline, which further describes their right to request information not to be published. • CAPL has provided MCH with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL will continue to engage MCH as part of its ongoing consultation for environment plans, as outlined in Section 10.3.4.1 of the EP.			
Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC)	25/09/2025	002569	Email	CAPL provided NTGAC with the September "Bulletin," outlining CAPL ongoing EPs. This included an overview of this EP. The Bulletin provides a detailed overview of proposed activities, including descriptions, location maps, timing, potential impacts, and the schedule for formal consultation. CAPL encouraged NTGAC to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	29/10/2025	002700	Email	CAPL sent a follow up email on the September Bulletin and asked if NTGAC had any questions, noting that CAPL are happy to arrange specialists to provide clarification or provide further information. CAPL requested a meeting with NTGAC before the end of the year. No response was received.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	05/12/2025	002809	Email	CAPL notified NTGAC on the recent GS3 Final Investment Decision.	No objection or claim raised		
	12/12/206	002857	Email	CAPL shared 2025 Highlights and 2026 Look Ahead email with NTGAC, which included request to arrange regular meetings with representatives to provide information on upcoming CAPL activities and EPs.	No objection or claim		
	17/12/2025	002818	Email	CAPL provided NTGAC with the December Bulletin outlining CAPL ongoing EPs. This included an overview of this EP. CAPL encouraged NTGAC to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	14/01/2026	002861	Email	CAPL followed up on 2025 Highlights and 2026 Look Ahead email shared with NTGAC. CAPL requested feedback on how NTGAC would like CAPL to deliver training opportunities, consultation on environment plans and next steps for priority protection area plans. CAPL requested to meet with NTGAC to discuss these matters.	No objection or claim raised		
	14/01/2026	003107	Email	NTGAC representative responded to CAPL's email following up on the 2025 Highlights and 2026 Look	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Ahead and suggested a date and time for a meeting to discuss.			
	14/01/2026	003108	Email	CAPL responded to NTGAC representative confirming availability to meet on 20 January 2026.	No objection or claim raised		
	20/01/2026	002940	Face-to-face	CAPL met with NTGAC representative to discuss capacity building opportunities for 2026. CAPL noted that they had provided NTGAC with the Bulletin in December 2025 and encouraged NTGAC to review the document and share any feedback, question or consultation on any of the EPs. No comments or feedback was received on this EP.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL provided a briefing on the activity ahead of formal consultation period on 26 November 2025 advising that NTGAC had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL has also included access to NOPSEMA's consultation guideline, which describes their right to request information not to be published. • CAPL provided NTGAC with the Bulletin newsletter on 25 September 2025 and 17 December 2025, providing further information on the activity and the opportunity for further briefings • NTGAC have previously provided information on their Healthy Sea Country Plan that provides guidance on the areas of importance to them for Sea Country. • CAPL have committed to a continued discussion on the identification of Priority Protection Area's that align with the Health Sea Country Plan. • CAPL has informed NTGAC that they may request information provided during consultation not to be			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				published (Regulation 25(4)) in opening consultation emails and activity information sheets. CAPL has also provided NTGAC with a copy of NOPSEMA's consultation guideline, which further describes their right to request information not to be published. • NTGAC has not raised any objections or claims relating to the activity. • CAPL has provided NTGAC with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL will continue to engage NTGAC as part of its ongoing consultation for environment plans, as outlined in Section 10.3.4.1 of the EP.			
Nhuwala Claimant Group	10/04/2025-16/04/2025	002153	Face-to-face and email	Nhuwala Claimant Group and CAPL met on 10 April 2025 in Perth to consult on another EP. CAPL provided the Nhuwala Claimant Group with: • A copy of NOPSEMA community consultation guideline • Presentation slides, including information regarding the 2025 EP consultation schedule and Gorgon Stage 3 overview. Within the meeting, the following areas were discussed: • Risks associated with drilling • Project information (relevant to another EP) within project and environment subject matter experts • Understanding of whale migration and biologically important areas • Consultation with other marine users including fishers • Chevrons understanding of the marine and subsea environment.	Nhuwala Claimant Group requested clarification. Nhuwala Claimant Group requested information shared with CAPL be stored securely with controlled access.	**Claims have merit:** The provision of clarification regarding activities and relevant information is considered fair and reasonable. CAPL recognise the requirement to store information securely and with controlled access.	No change made to the EP. Clarification was provided on the raised points during the meeting. CAPL confirmed the requirement to store information securely and with controlled access.

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Nhuwala Claimant Group asked about the privacy of the information captured through consultation and requested information be stored securely with controlled access.			
	25/09/2025	002568	Email	CAPL provided Nhuwala Claimant Group with the September "Bulletin," outlining CAPL ongoing EPs. This included an overview of this EP. The Bulletin provides a detailed overview of proposed activities, including descriptions, location maps, timing, potential impacts, and the schedule for formal consultation. CAPL encouraged Nhuwala Claimant Group to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	24/10/2025	002766	Phone	CAPL spoke to Nhuwala Claimant Group representatives to discuss a potential November meeting date. CAPL explained the detail in the Bulletin and requested any particular topics that were of interest to Nhuwala Claimant Group. CAPL confirmed that participation of surveys will be completed through PBC's.	No objection or claim raised		
	23/10/2025-27/10/2025	002699	Email	Nhuwala Claimant Group emailed CAPL to gauge availability for meeting and requested clarification regarding participation in surveys. CAPL replied and provided input regarding availability and provided clarification regarding survey participation.	No objection or claim raised		
	06/11/2025	002767	Phone	CAPL received a text message from Nhuwala Claimant Group representatives informing we can defer the next Nhuwala/CAPL consultation until next year.			
	07/11/2025	002710	Email	CAPL followed up with Nhuwala Claimant Group on the Bulletin and if there was any further information needed on the activities.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	05/12/2025	002809	Email	CAPL notified Nhuwala Claimant Group on the recent GS3 Final Investment Decision.	No objection or claim raised		
	12/12/206	002857	Email	CAPL shared 2025 Highlights and 2026 Look Ahead email with Nhuwala Claimant Group, which included request to arrange regular meetings with representatives to provide information on upcoming CAPL activities and EPs.	No objection or claim		
	17/12/2025	002820	Email	CAPL provided Nhuwala Claimant Group with the December Bulletin outlining CAPL ongoing EPs. This included an overview of this EP. CAPL encouraged Nhuwala Claimant Group to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	14/01/2026	003148	Email	CAPL followed up on 2025 Highlights and 2026 Look Ahead email shared with the Nhuwala Claimant Group. CAPL requested feedback on how the Nhuwala Claimant Group would like CAPL to deliver training opportunities, consultation on environment plans and next steps for priority protection area plans. CAPL requested to meet with representative to discuss these matters.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	15/01/2026	002878	Email	Nhuwala Claimant Group representative responded to CAPL's email following up on the 2025 Highlights and 2026 Look Ahead and advised that they would like to meet with CAPL.	No objection or claim raised		
	19/01/2026	003150	Email	CAPL responded to Nhuwala Claimant Group representative suggesting potential time and date for the meeting.	No objection or claim raised		
	20/01/2026	003151	Email	Nhuwala Claimant Group representative responded confirming time and date and suggested to meet that they office.	No objection or claim raised		
	20/01/2026	003153	Email	CAPL confirm availability for meeting and location.	No objection or claim raised		
	20/01/2026	003155	Email	Nhuwala Claimant Group representative confirmed that a meeting invite will be sent to CAPL shortly.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
	03/02/2026	002939	Face-to-face	CAPL met with Nhuwala Claimant Group representative to discuss capacity building opportunities for 2026. CAPL noted that they had provided the Nhuwala Claimant Group with the Bulletin in December 2025 and encouraged the Nhuwala Claimant Group to review the document and share any feedback, question or consultation on any of the EPs. No comments or feedback was received on this EP.	No objection or claim raised		
				Summary: • CAPL provided a briefing on the activity ahead of formal consultation period on 26 November 2025 advising that Nhuwala Claimant Group had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL has also included access to NOPSEMA's consultation guideline, which describes their right to request information not to be published.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL provided Nhuwala Claimant Group with the Bulletin newsletter on 25 September 2025 and 17 December 2025, providing further information on the activity and the opportunity for further briefings. • CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • CAPL notified that Nhuwala Claimant Group that they are committed to ongoing consultation communication and welcome meaningful feedback. • Nhuwala Claimant Group has previously asked about the privacy of the information captured through consultation and requested information be stored securely with controlled access. • CAPL has informed Nhuwala Claimant Group that they may request information provided during consultation not to be published (Regulation 25(4)) in opening consultation emails and activity information sheets. CAPL has also provided Nhuwala Claimant Group with a copy of NOPSEMA's consultation guideline, which further describes their right to request information not to be published. • Nhuwala Claimant Group has not raised any objections or claims relating to the activity. • CAPL has provided Nhuwala Claimant Group with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL will continue to engage Nhuwala Claimant Group as part of its ongoing consultation for environment plans, as outlined in Section 10.3.4.1 of the EP.			
Wirrawandi Aboriginal Corporation RNTBC (WAC)	10/09/2025	002620	Email	CAPL emailed WAC following up on potential next steps in developing priority protection area plans for ongoing consultation.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	25/09/2025	002568	Email	CAPL provided WAC with the September "Bulletin," outlining CAPL ongoing EPs. This included an overview of this EP. The Bulletin provides a detailed overview of proposed activities, including descriptions, location maps, timing, potential impacts, and the schedule for formal consultation. CAPL encouraged WAC to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	07/11/2025	002708	Email	CAPL followed up on the September Bulletin and welcomed the opportunity to meet or discuss the information shared.	No objection or claim raised		
	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	05/12/2025	002809	Email	CAPL notified WAC on the recent GS3 Final Investment Decision.	No objection or claim raised		
	12/12/2025	002857	Email	CAPL shared 2025 Highlights and 2026 Look Ahead email with WAC, which included request to arrange regular meetings with representatives to provide information on upcoming CAPL activities and EPs.	No objection or claim raised		
	17/12/2025	002819	Email	CAPL provided WAC with the December Bulletin outlining CAPL ongoing EPs. This included an overview of this EP. CAPL encouraged WAC to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	15/01/2025	002797	Email	CAPL followed up on 2025 Highlights and 2026 Look Ahead email shared with WAC. CAPL requested feedback on how WAC would like CAPL to deliver training opportunities, consultation on environment plans and next steps for priority protection area plans. CAPL requested to meet with WAC to discuss these matters.	No objection or claim raised		
	15/01/2026	002879	Email	WAC responded to CAPL's email following up on the 2025 Highlights and 2026 Look Ahead and suggested a date for a meeting.	No objection or claim raised		
	21/01/2026	002941	Virtual Meeting	CAPL met with WAC representative to discuss capacity building opportunities for 2026. CAPL noted that they had provided WAC with the Bulletin in December 2025 and encouraged WAC to review the document and share any feedback, question or consultation on any of the EPs.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL provided a briefing on the activity ahead of formal consultation period on 26 November 2025 advising that WAC had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL has also included access to NOPSEMA's consultation guideline, which describes their right to request information not to be published. • CAPL provided WAC with the Bulletin newsletter on 25 September 2025 and 17 December 2026, providing further information on the activity and the opportunity for further briefings.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL has met with WAC representatives in a face-to-face meeting and maintained contact through email correspondence • CAPL has informed WAC that they may request information provided during consultation not to be published (Regulation 25(4)) during consultation co-design, in opening consultation emails and activity information sheets. CAPL has also provided WAC with a copy of NOPSEMA's consultation guideline, which further describes their right to request information not to be published. • WAC did not raise any objections or claims relating to the activity. • CAPL has provided WAC with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL will continue to engage WAC as part of its ongoing consultation for environment plans, as outlined in Section 10.3.4.1 of the EP.			

1.3.2 Commercial fishery licence holders and/or representative bodies

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Aquaculture Council of WA (ACWA)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with ACWA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • ACWA has not raised any objections or claims relating to the activity. • CAPL has provided ACWA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Australian Council of Prawn	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Fisheries (ACPF) Ltd.				information sheet and a link to CAPLs consultation webpage.			
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with ACPF on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • ACPF has not raised any objections or claims relating to the activity. • CAPL has provided ACPF with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Australian Southern Bluefin Tuna Industry Association (ASBTIA)	27/11/2025	002758	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002846	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	08/01/2026	002868	Email	ASBTIA replied and thanked CAPL for their engagement. ASBTIA provided information regarding the Southern Bluefin Tuna (SBT) fishery, including the presence of spawning ground. ASBTIA recommended consideration of SBT spawning and migratory activity in the EP. ASBTIA noted impacts to the species as a result of acoustic exploration techniques.	ASBTIA raised: • Information regarding SBT fishery, • SBT spawning ground and migratory activity • Impacts to SBT as a result of acoustic exploration techniques	**Claims have merit:** The SBT fishery, spawning ground and migratory activity are relevant to the EP. **Claim does not have merit:** While CAPL acknowledge concerns regarding acoustic exploration techniques, there is no seismic activity within the scope of this EP.	The SBT fishery, spawning ground and migratory movements are described in Section 5.4.1.1 of the EP. SBT is considered within the risk assessment in Section 8.15 and 8.16. CAPL responded and acknowledged the input provided (Record ID: 002885)
	21/01/2026	002885	Email	CAPL thanked ASBTIA for their response and input. CAPL confirmed the Southern Bluefin Tuna fishery is included within the EP. CAPL confirmed that the spatial extent of the spawning ground was reviewed and is located outside the OA, but does extend within the Hydrocarbon EMBA. Southern Bluefin Tuna (spawning) has been screened as a relevant receptor within the environmental risk assessments.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				CAPL confirmed that there was no seismic activity within the scope of the EP. CAPL noted that the input provided by ASBTIA was passed on to the project and environmental team.			
	22/01/2026	002891	Email	CAPL advised ASBTIA that the consultation period had closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with ASBTIA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • ASBTIA has not raised any objections or claims relating to the activity. ASBTIA raised the presence of the SBT fishery, SBT spawning ground and the migratory nature of SBT. These factors are addressed within the EP, in Section 5.4.1.1, 8.15 and 8.16 of the EP. • CAPL has provided ASBTIA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Commonwealth Fisheries Association (CFA)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with CFA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • CFA has not raised any objections or claims relating to the activity. • CAPL has provided CFA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities, CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Tuna Australia	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	08/01/2026	002869	Email	Tuna Australia replied and provided additional email contact for future engagement. Tuna Australia indicated intent to provide a response to EP information by the 20th of January. CAPL confirmed Tuna Australia additional email added to mail list. Tuna Australia thanked CAPL for adding additional email contact and confirmed will be in touch	No objection or claim raised		
	19/01/2026	002880	Email	CAPL responded to Tuna Australia, looking forward to hearing back soon	No objection or claim raised		
	20/01/2026	002899	Email	Tuna Australia replied and provided a consultation report for the EP. Tuna Australia provided information regarding their organisation and associated fisheries, noting that the presence of historic and future longline effort in the Western Tuna and Billfish Fishery in the region. Tuna Australia raised concerns regarding: • Access to fishing areas	Tuna Australia raised concerns regarding: • Access to fishing areas • Notice to mariners, and requested additional notifications • Historic yellowfin tuna aggregation site • Southern Bluefin Tuna migration and consideration in	**Claims have merit:** The input raised is relevant to the activity and location.	CAPL provided a response and addressed all concerns and queries raised (Record ID: 002895). CAPL confirmed no permanent exclusion zones will be sought for the new wells. Marine notices will be issued prior to activity commencement that include a temporary exclusion zone around the MODU.

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• Notice to mariners, and requested additional notifications • Historic yellowfin tuna aggregation site • Southern Bluefin Tuna migration and consideration in environmental assessment • Addressing and minimising downstream effects of activities, including releases of hydrocarbons or chemical discharges • Adequate risk assessment of cumulative impacts in the region.	environmental assessment • Addressing and minimising downstream effects of activities, including releases of hydrocarbons or chemical discharges • Adequate risk assessment of cumulative impacts in the region.		The requirement to issue a Notice to Mariners is already captured within the EP (Table 10-5). Table 10-5 was updated to include notification to Tuna Australia. The risk assessment for physical presence was updated. Section 8.1.2.2 ‘ALARP decision context justification' revised to include statement regarding receipt of the claim. No change to previous decision context (i.e. still Decision Context A). 'External context' (within Section 8.1.3 Demonstration of acceptability') has been updated with a summary of claim and response.” CAPL acknowledged Tuna Australia’s concern regarding yellowfin tuna aggregation, noting they were unaware of any geomorphic or oceanic feature that would support aggregation. CAPL requested any information Tuna Australia could share of this. Southern bluefin tuna are described in Section 5.4.1.1 and are considered within the risk assessment in Section 8.15 and 8.16. The risk assessment for leaks and spills was updated. Section 8.14.2.2 ‘ALARP decision context justification' revised to include statement regarding receipt of the claim. No change to previous decision context (i.e. still Decision Context A).

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
							'External context' (within Section 8.14.3 Demonstration of acceptability') has been updated with a summary of claim and response." Planned discharges from drilling operations and their potential impacts to water quality are risk assessed in Section 8.9. The potential environmental risks from unplanned events are evaluated in Section 8.15 and 8.16. Potential cumulative environmental impacts and risks associated with planned activities are described and evaluated within Section 8 the EP, where applicable.
	27/01/2026	002895	Email	CAPL thanked Tuna Australia from their input and provided a response to all concerns raised. CAPL confirmed they will provide the requested activity notifications. CAPL requested further information regarding yellowfin tuna aggregation.	No objection or claim raised		
	14/02/2026	002985	Email	Tuna Australia responded and acknowledged CAPL's responses to the raised concerns. Tuna Australia provided additional information regarding yellowfin tuna for consideration. Tuna Australia noted that a spill event would impact commercial fisheries.	Tuna Australia raised: • Information regarding yellowfin tuna • that a spill event would impact commercial fisheries.	**Claims have merit:** CAPL acknowledge the information provided regarding yellowfin tuna as a potential receptor. Commercial fisheries are identified and considered as a potential receptor for spill events.	Section 5.4.1.1 describes relevant fisheries, and was revised to include additional information regarding yellowfin tuna. Impacts to fisheries from a potential spill event are considered within the risk assessment in Section 8.15.4.1.4 and 8.16.4.1.4, including consideration of yellowfin and southern bluefin tuna. Section 8.15.4.2 and 8.16.4.2 'ALARP decision context

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
							justification' revised to include statement regarding receipt of the claim. No change to previous decision context (i.e. still Decision Context A). 'External context' (within Section 8.15.5 and 8.16.5 Demonstration of acceptability') has been updated with a summary of claim and response.
	04/03/2026	003020	Email	CAPL replied and acknowledged the information provided. CAPL confirmed that the Description of the Environment section includes yellowfin tuna, and that the potential impacts to fisheries in a spill event are considered within the environmental risk assessment sections. CAPL also noted that the provided references were recorded internally.	No objection or claim raised		
	06/03/2026	003021	Email	Tuna Australia thanked CAPL for their response.	No objection or claim raised.		
				Summary: • CAPL commenced consultation with Tuna Australia on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Tuna Australia raised multiple concerns regarding fishery operator access, potential receptors, notification requirements, downstream and cumulative impacts, and impact to fisheries in the event of a spill. CAPL provided a response addressing all			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				concerns raised and are addressed within the EP. Tuna Australia acknowledged CAPL's response regarding their concerns. • CAPL has provided Tuna Australia with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Western Australian Fishing Industry Council (WAFIC)	25/09/2025	002569	Email	CAPL provided WAFIC with the September "Bulletin," outlining CAPL EPs. This included an overview of this EP. The Bulletin provides a detailed overview of proposed activities, including descriptions, location maps, timing, potential impacts, and the schedule for formal consultation. CAPL encouraged WAFIC to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	26/11/2025	002740	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage. CAPL provided WAFIC with additional information in regard to biosecurity measures and spill response preparedness.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	28/11/2025	002753	Email	WAFIC emailed CAPL to request confirmation that CAPL would like the email and attachment to be forwarded to relevant licence holders. CAPL confirmed that they would like the email and attached information sheet to be distributed by WAFIC to relevant fisheries. CAPL provided WAFIC a list of identified commercial fisheries operating in the OA, specifically: • North West Slope Trawl Fishery • Pilbara Line Fishery.	No objection or claim raised		
	28/11/2025-02/12/2025	002755	Email	WAFIC emailed CAPL to confirm that GS3 Drilling launch email and attached information sheet was distributed to relevant licence holders. WAFIC informed CAPL that they will hold off on relaying any feedback or comments until 20 January 2026. CAPL thanked WAFIC for confirming.	No objection or claim raised		
	17/12/2025	002821	Email	CAPL provided WAFIC with the December Bulletin outlining CAPL ongoing EPs. This included an overview of this EP. CAPL encouraged WAFIC to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	20/01/2026-29/01/2026	002905	Email	WAFIC confirmed that no feedback was received from industry regarding the GS3 Drilling EP. WAFIC noted their concern regarding potential impacts to commercial fishing, and requested a spatial overlay of the OA and fishing data for the Pilbara Line Fishery and North West Slope Trawl Fishery. WAFIC raised concern regarding potential damage	WAFIC requested further information and raised concern regarding damage or loss of fishing gear, potential impacts from planned discharges, and raised unplanned spill event preparedness.	**Claims have merit:** Input raised by WAFIC is relevant to the activity	CAPL provided WAFIC a response and addressed all queries and concerns raised, and provided the requested figures. The risks to commercial fishing as a result of physical presence risk assessed in Section 8.1.

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				or loss of commercial fishing gear, and enquired into the compensation protocol. WAFIC raised concerns regarding the potential planned discharges of drill cuttings, drill fluids and cement, and requested clarification regarding cumulative impacts. WAFIC confirmed their understanding regarding unplanned events, and requested activity notifications. CAPL thanked WAFIC for their input and provided a response to all concerns and questions raised, and provided the requested figures.	WAFIC requested activity notifications.		Section 8.1.2.2 'ALARP decision context justification' revised to include statement regarding receipt of the claim. No change to previous decision context (i.e. still Decision Context A). 'External context' (within Section 8.1.3 Demonstration of acceptability') has been updated with a summary of claim and response." The impacts and risks associated with planned discharges from drilling operations are discussed in Section 8.9. Cumulative impacts associated with these discharges are considered and were deemed not credible, as discussed further in Section 8.9.4. Section 8.9.3.2 'ALARP decision context justification' revised to include statement regarding receipt of the claim. No change to previous decision context (i.e. still Decision Context A). 'External context' (within Section 8.9.4 Demonstration of acceptability') has been updated with a summary of claim and response." Table 10-5 was updated to include notification to WAFIC.
				Summary: • CAPL provided a briefing on the activity ahead of formal consultation period on 26 November 2025 advising that WAFIC had been identified as a			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				relevant person with functions, interests or activities that may be affected by the activity. CAPL has also included access to NOPSEMA's consultation guideline, which describes their right to request information not to be published. • CAPL provided WAFIC with the Bulletin newsletter on 25 September 2025 and 17 December 2025, providing further information on the Activity and providing opportunity for further briefings • WAFIC has not raised any objections or claims relating to the activity. WAFIC requested further information and raised concern regarding damage or loss of fishing gear, potential impacts from planned discharges, and raised unplanned spill event preparedness. WAFIC also requested activity notifications. All factors raised for consideration are addressed within the EP, including the commitment to ongoing engagement (Table 10-5). • CAPL has provided WAFIC with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

1.3.3 Tourism and recreation operators

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Apache Fishing Charters	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Apache on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Apache has not raised any objections or claims relating to the activity. • CAPL has provided Apache with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Aquatic Adventure Exmouth	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Aquatic Adventure Exmouth on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Aquatic Adventure Exmouth has not raised any objections or claims relating to the activity. • CAPL has provided Aquatic Adventure Exmouth with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Archipelago Adventures	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Archipelago Adventures on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Archipelago Adventures has not raised any objections or claims relating to the activity. • CAPL has provided Archipelago Adventures with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ashburton Anglers	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ashburton Anglers on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ashburton Anglers has not raised any objections or claims relating to the activity. • CAPL has provided Ashburton Anglers with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Blue Horizon Charters	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Blue Horizon Charters on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Blue Horizon Charters has not raised any objections or claims relating to the activity. • CAPL has provided Blue Horizon Charters with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Blue Juice Charters	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Blue Juice Charters on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Blue Juice Charters has not raised any objections or claims relating to the activity. • CAPL has provided Blue Juice Charters with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Blue Lightning Fishing Charters	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Summary: • CAPL commenced consultation with Blue Lightning Fishing Charters on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Blue Lightning Fishing Charters has not raised any objections or claims relating to the activity. • CAPL has provided Blue Lightning Fishing Charters with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Bluesun 2 Boat Charters	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Bluesun 2 Boat Charters on 26 November 2025 via email advising they had been identified as a relevant person with functions,			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Bluesun 2 Boat Charters has not raised any objections or claims relating to the activity. • CAPL has provided Bluesun 2 Boat with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Boating Industry Association Western Australia (BIAWA)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with BIAWA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• BIAWA has not raised any objections or claims relating to the activity. • CAPL has provided BIAWA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Cape Immersion Tours	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Cape Immersion Tours on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Cape Immersion Tours has not raised any objections or claims relating to the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL has provided Cape Immersion Tours with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Exmouth Dive Centre	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Exmouth Dive Centre on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Exmouth Dive Centre has not raised any objections or claims relating to the activity. • CAPL has provided Exmouth Dive Centre with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Exmouth Dive & Whalesharks Ningaloo	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	26/11/2025	002759	Email	CAPL received automated response confirming receipt of email.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	17/12/2025	002805	Email	CAPL received automated response confirming receipt of email.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Exmouth Dive & Whalesharks Ningaloo on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Exmouth Dive & Whalesharks Ningaloo has not raised any objections or claims relating to the activity. • CAPL has provided Exmouth Dive & Whalesharks with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Exmouth Game Fishing Club	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Exmouth Game Fishing Club on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Exmouth Game Fishing Club has not raised any objections or claims relating to the activity. • CAPL has provided Exmouth Game Fishing Club with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Image Dive and Charters	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002896	Phone	Image Dive and Charters opted out of consultation, noting that they are not currently operating in the Northwest Shelf.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Image Dive and Charters on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Image Dive and Charters has not raised any objections or claims relating to the activity. • CAPL has provided Image Dive and Charters with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Innkeeper Sport Fishing Charter	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Innkeeper Sport Fishing Charter on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Innkeeper Sport Fishing Charter has not raised any objections or claims relating to the activity. • CAPL has provided Innkeeper Sport Fishing Charter with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Kings Ningaloo Reef Tours	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Kings Ningaloo Reef Tours on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Kings Ningaloo Reef Tours has not raised any objections or claims relating to the activity. • CAPL has provided Kings Ningaloo Reef Tours with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Live Ningaloo	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Live Ningaloo on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Live Ningaloo has not raised any objections or claims relating to the activity. • CAPL has provided Live Ningaloo with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Mackerel Islands & Onslow Beach Resort	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002843	Phone	Mackerel Islands & Onslow Beach Resort requested to be removed from text message updates.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Mackerel Islands & Onslow Beach Resort on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Mackerel Islands & Onslow Beach Resort has not raised any objections or claims relating to the activity. • CAPL has provided Mackerel Islands & Onslow Beach Resort with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Mahi Mahi Charters	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				provided an information sheet and a link to CAPLs consultation webpage.			
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Mahi Mahi Charters on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Mahi Mahi Charters has not raised any objections or claims relating to the activity. • CAPL has provided Mahi Mahi Charters with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Marine Tourism Association of Western Australia (MTWA)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with MTWA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • MTWA has not raised any objections or claims relating to the activity. • CAPL has provided MTWA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Montebello Island Safaris	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Montebello Island Safaris on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Montebello Island Safaris has not raised any objections or claims relating to the activity. • CAPL has provided Montebello Island Safaris with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ningaloo Blue Dive	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Blue Dive on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ningaloo Blue Dive has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Blue Dive with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ningaloo Coral Bay Boats	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Summary: • CAPL commenced consultation with Ningaloo Coral Bay Boats on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ningaloo Coral Bay Boats has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Coral Bay Boats with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ningaloo Discovery	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Discovery on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ningaloo Discovery has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Discovery with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ningaloo Fly Fishing	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Fly Fishing on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• Ningaloo Fly Fishing has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Fly Fishing with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ningaloo Glass Bottom Boat	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Glass Bottom Boat on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ningaloo Glass Bottom Boat has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Glass Bottom Boat with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ningaloo Marine Interaction	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Marine Interaction on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ningaloo Marine Interaction has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Marine Interaction with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ningaloo Reef Dive	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Reef Dive on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ningaloo Reef Dive has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Reef Dive with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Ningaloo Reef to Range Tours	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Reef to Range Tours on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ningaloo Reef to Range Tours has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Reef to Range Tours with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Ningaloo Safari Tours	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Safari Tours on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ningaloo Safari Tours has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Safari Tours with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ningaloo Sportfishing Charters	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Sportfishing Charters on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ningaloo Sportfishing Charters has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Sportfishing Charters with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ningaloo Visitor Centre	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Visitor Centre on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ningaloo Visitor Centre has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Visitor Centre with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ningaloo Whaleshark n Dive	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Whaleshark n Dive on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ningaloo Whaleshark n Dive has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Whaleshark n Dive with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ningaloo Whaleshark Swim	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ningaloo Whaleshark Swim on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ningaloo Whaleshark Swim has not raised any objections or claims relating to the activity. • CAPL has provided Ningaloo Whaleshark Swim with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ocean Eco Adventures	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ocean Eco Adventures on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Ocean Eco Adventures has not raised any objections or claims relating to the activity. • CAPL has provided Ocean Eco Adventures with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
On Strike Charters	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with On Strike Charters on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • On Strike Charters has not raised any objections or claims relating to the activity. • CAPL has provided On Strike Charters with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Peak Sportfishing Charters	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Summary: • CAPL commenced consultation with Peak Sportfishing Charters on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Peak Sportfishing Charters has not raised any objections or claims relating to the activity. • CAPL has provided Peak Sportfishing Charters with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Recfishwest (WA)	26/11/2025	002735	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage. CAPL confirmed that based on previous engagement received by Recfishwest, CAPL will continue to provide them with ongoing engagement.	No objection or claim raised		
	17/12/2025	002802	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002831	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	13/01/2026-19/01/2026	002881	Email	Recfishwest replied and confirmed receipt of the EP information Recfishwest noted that recreational fishing is likely to be infrequent given the offshore location of the activities.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				CAPL thanked Recfishwest for their response and confirmed no concerns.			
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Recfishwest on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Recfishwest has not raised any objections or claims relating to the activity. • CAPL has provided Recfishwest with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Sail Ningaloo	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Sail Ningaloo on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Sail Ningaloo has not raised any objections or claims relating to the activity. • CAPL has provided Sail Ningaloo with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Three Islands Whale Shark Tours	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary:			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL commenced consultation with Three Islands Whale Shark Tours on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Three Islands Whale Shark Tours has not raised any objections or claims relating to the activity. • CAPL has provided Three Islands Whale Shark Tours with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Top Gun Charters	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Top Gun Charters on 26 November 2025 via email advising they had been			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Top Gun Charters has not raised any objections or claims relating to the activity. • CAPL has provided Top Gun Charters with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Ultimate WaterSports	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Ultimate WaterSports on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• Ultimate WaterSports has not raised any objections or claims relating to the activity. • CAPL has provided Ultimate WaterSports with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
View Ningaloo	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with View Ningaloo on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • View Ningaloo has not raised any objections or claims relating to the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL has provided View Ningaloo with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Wilderness Island	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Wilderness Island on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Wilderness Island has not raised any objections or claims relating to the activity. • CAPL has provided Wilderness Island with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Yardi Creek Boat Tours	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002901	Phone	CAPL sent follow up text message requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Yardi Creek Boat Tours on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Yardi Creek Boat Tours has not raised any objections or claims relating to the activity. • CAPL has provided Yardi Creek Boat Tours with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

1.3.4 Local government departments or agencies

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Shire of Ashburton (SOA) (Pilbara)	26/11/2025	002737	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage. CAPL provided additional information regarding spill response preparedness, consultation in the event of an emergency, and environmental management and risk mitigation.	No objection or claim raised		
	17/12/2025	002800	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002836	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	08/01/2026	002849	Email	SOA replied and advised no direct feedback to offer on the EP. CAPL thanked SOA for confirming no direct feedback and advised CAPL will consider consultation closed unless otherwise advised	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with SOA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				overview of the activity and provided a link to their website for further information regarding the activity. • SOA has not raised any objections or claims relating to the activity. • CAPL has provided SOA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Shire of Carnarvon (SOC) (Gascoyne)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	08/01/2026	002855	Email	SOC replied and confirmed receipt of the provided EP information. SOC noted that based on the information provided, no impacts to Shire managed interests are expected. SOC raised the importance of environmental risk considerations, and noted it's support of: • Preventative and mitigation measures managing risks to ALARP and acceptable levels • Clear oil spill response planning	SOC raised the importance of: • Preventative and mitigation measures managing risks to ALARP and acceptable levels • Oil spill response • Spill modelling assumptions and	**Claims have merit:** The factors raised for consideration are relevant to the activity.	CAPL acknowledge the importance of the environmental risk considerations raised. The environmental impact and risk assessment methodology (Section 6) includes the inclusion and consideration of control measures and ALARP, and impact and risk acceptance criteria.

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• Transparency regarding spill modelling assumptions and response planning. SOC suggested consideration of cumulative impacts from multiple offshore petroleum activities. SOC confirmed that they have no objections in principle to the proposed activities. SOC thanked CAPL for the opportunity to consult and requests ongoing engagement in regard to key milestones or material changes. CAPL thanked SOC and confirmed no objections in principle. CAPL confirmed they will keep SOC informed on key milestones or relevant changes to the EP	response planning. • Consideration of cumulative impacts from multiple offshore petroleum activities. SOC requested ongoing engagement.		Oil spill preparedness and response is covered in Section 9 of the EP, the Consolidated OPEP and operational and scientific monitoring is covered in the OSMP. The parameters for spill modelling included within this EP are listed within Section 8.15.3 and 8.16.3. Potential cumulative environmental impacts and risks associated with planned activities are described and evaluated within Section 8 the EP, where applicable. The commitment to ongoing engagement is listed in Table 10-5. CAPL replied to SOC and confirmed they would provide ongoing engagement.
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with SOC on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • SOC has not raised any objections or claims relating to the activity. SOC did raise mitigation measures, oil spill response, spill modelling and cumulative impacts, and requested ongoing engagements. All factors raised for consideration are addressed within			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				the EP, including the commitment to ongoing engagement with SOC (Table 10-5) • CAPL has provided SOC with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Shire of Exmouth (SOE) (Gascoyne)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	23/12/2025	002845	Email	SOE responded to confirm receipt of email and that it had been shared internally.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with SOE on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • SOE has not raised any objections or claims relating to the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL has provided SOE with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

1.3.5 WA World Heritage advisory committees

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Ningaloo Coast World Heritage Advisory Committee (NCWHAC)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with NCWHAC on 26 November 2025 via email advising they had been identified as a relevant person with functions,			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • NCWHAC has not raised any objections or claims relating to the activity. • CAPL has provided NCWHAC with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

1.3.6 Other Petroleum Titleholders

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Carnarvon Energy	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002765	Email	CAPL sent follow up email requesting feedback on the EP information. Carnarvon Energy thanked CAPL for their email and confirmed no feedback. CAPL thanked Carnarvon Energy for their response and noted that they will consider consultation closed unless otherwise advised.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Carnarvon Energy on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Carnarvon Energy has not raised any objections or claims relating to the activity. • CAPL has provided Carnarvon Energy with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Eni Australia	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Summary: • CAPL commenced consultation with Eni Australia on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Eni Australia has not raised any objections or claims relating to the activity. • CAPL has provided Eni Australia with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Exxon Mobil	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Exxon Mobil on 26 November 2025 via email			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Exxon Mobil has not raised any objections or claims relating to the activity. • CAPL has provided Exxon Mobil with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Jadestone Energy	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	26/11/2025	002784	Email	Undelivered mail returned to sender.	No objection or claim raised		
	10/12/2025	002794	Email	Notification of consultation launch sent via alternate emails. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage. CAPL requested Jadestone Energy advise preferred contact for consultation. No response was received.	No objection or claim raised		
	12/03/2026	003043	Email	CAPL sent a follow up email advising it had attempted to contact their organisation and to date no response had been received.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	25/03/2026	003102	Email	CAPL sent an additional follow up email advising it had attempted via another email address to contact their organisation and to date no response had been received. CAPL advised the consultation period for the EP has closed. CAPL followed up on request for correct contact for future consultation.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Jadestone Energy on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Jadestone Energy has not raised any objections or claims relating to the activity. • CAPL has provided Jadestone Energy with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Kato Energy / Kato NWS Pty Ltd	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Kato Energy on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Kato Energy has not raised any objections or claims relating to the activity. • CAPL has provided Kato Energy with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Kuwait Foreign Petroleum Exploration Company (KUFPEC)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	14/01/2026-19/01/2026	002882	Email	KUFPEC responded and confirmed no objections to the confirmed activities. CAPL thanked KUFPEC for their response.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with KUFPEC on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • KUFPEC has not raised any objections or claims relating to the activity. • CAPL has provided KUFPEC with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Santos	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	04/12/2025-16/12/2025	002795	Email	Santos replied and thanked CAPL for their email. Santos noted the potential for concurrent well operations in 2027 and requested activity notifications for planned vessel movements. CAPL thanked Santos for feedback and confirmed Santos included in activity notifications for planned vessel movements.	Santos requested activity notifications for planned vessel movements	**Claim has merit:** As a Relevant Person, the request for notification is considered fair and reasonable.	Table 10-5 was updated to include the ongoing engagement with Santos.
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Summary: • CAPL commenced consultation with Santos on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Santos has not raised any objections or claims relating to the activity. Santos requested activity notifications. CAPL confirmed Santos is in activity notification, as captured in Table 10-5 of the EP. • CAPL has provided Santos with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Shell	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Summary: • CAPL commenced consultation with Shell on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Shell has not raised any objections or claims relating to the activity. • CAPL has provided Shell with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Western Gas	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Western Gas on 26 November 2025 via email advising			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Western Gas has not raised any objections or claims relating to the activity. • CAPL has provided Western Gas with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Woodside	27/11/2025	002751	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage. Woodside replied and provided CAPL with updated email address for consultation on environmental plans. CAPL thanked Woodside for confirming updated email for consultation. CAPL requested Woodside provide additional information on the scopes and timing for any upcoming activities within or near the GS3 operational area which may coincide with GS3 drilling activities.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	06/01/2026	002900	Email	Woodside responded and provided information regarding their offshore activity in the region and noted the potential for ensonified areas to overlap. Woodside requested GIS shapefiles for the ensonified areas for this activity.	Woodside provided information regarding their offshore activity in the region and noted the potential for	**Claim has merit:** The information provided is relevant to this activity, and the request for further	Section 5.4.6 was updated to include Woodside petroleum activities within the region.

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
					ensonified areas to overlap. Woodside requested GIS shapefiles for the ensonified areas for this activity.	information is considered fair and reasonable.	Assessment of concurrent activities was addressed in the light non-impulsive sound emission sections in Section 8 (Section 8.5.3 and 8.6.3 respectively). CAPL responded and provided Woodside with the GIS shapefile (Record ID: 002900).
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
	27/01/2026	002900	Email	CAPL thanked Woodside for the information provided on 6 January and provided the requested GIS shapefile. CAPL noted that sound assessments are still underway but will be included within the EP upon submission to NOPSEMA. CAPL noted that the consultation period for this EP had closed, however welcomes further follow up on the information provided if required.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Woodside on 27 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Woodside has not raised any objections or claims relating to the activity. Woodside requested GIS shapefiles related to the activity, which CAPL provided. Woodside provided information regarding their offshore activities within the region, which is considered within the EP. • CAPL has provided Woodside with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

1.3.7 ENGOs

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Australian Marine Conservation Society (AMCS)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with AMCS on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• AMCS has not raised any objections or claims relating to the activity. • CAPL has provided AMCS with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Cape Conservation Group (CCG)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with CCG on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CCG has not raised any objections or claims relating to the activity. • CAPL has provided CCG with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Protect Ningaloo	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Protect Ningaloo on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• Protect Ningaloo has not raised any objections or claims relating to the activity. • CAPL has provided Protect Ningaloo with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

1.3.8 Other

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Australian Institute of Marine Science (AIMS)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with AIMS on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				and provided a link to their website for further information regarding the activity. • AIMS has not raised any objections or claims relating to the activity. • CAPL has provided AIMS with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Australian Marine Oil Spill Response Centre (AMOSC)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with AMOSC on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • AMOSC has not raised any objections or claims relating to the activity.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL has provided AMOSC with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Care For Hedland Environmental Association	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Care For Hedland on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Care For Hedland has not raised any objections or claims relating to the activity. • CAPL has provided Care For Hedland with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions,			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Exmouth Gulf Task Force - DWER	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Exmouth Gulf Task Force on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Exmouth Gulf Task Force has not raised any objections or claims relating to the activity. • CAPL has provided Exmouth Gulf Task Force with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Carnarvon Chamber of Commerce Inc. (CCCI)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with CCCI on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • CCCI has not raised any objections or claims relating to the activity. • CAPL has provided CCCI with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Exmouth Chamber of Commerce and Industry (ECCI)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with ECCI on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • ECCI has not raised any objections or claims relating to the activity. • CAPL has provided ECCI with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Oil Spill Response Limited (OSRL)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	17/12/2025	002844	Email	CAPL sent follow up email requesting feedback on the EP information. OSRL confirmed no feedback or concerns and advised if any issues arise, they will reach out before consultation close.	No objection or claim raised		
	08/01/2026	002853	Email	CAPL thanked OSRL for response and confirmed OSRL has no feedback or concerns	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with OSRL on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • OSRL has not raised any objections or claims relating to the activity. • CAPL has provided OSRL with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Onslow Chamber of Commerce and Industry (OCCI)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with OCCI on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • OCCI has not raised any objections or claims relating to the activity. • CAPL has provided OCCI with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Telstra	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Telstra on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Telstra has not raised any objections or claims relating to the activity. • CAPL has provided Telstra with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Vocus Communications	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	08/01/2026	002852	Email	Vocus confirmed they operate outside of CAPL designated area of operations and have no comments.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				CAPL thanked Vocus and confirmed no comment, and unless otherwise advised CAPL will consider consultation closed.			
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with Vocus on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Vocus has not raised any objections or claims relating to the activity. • CAPL has provided Vocus with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

1.4 Regulation 25(1)(e) - Any other person or organisation that the titleholder considers relevant

1.4.1 Commercial fishery licence holders and/or representative bodies

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Pearl Producers Association (PPA)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with PPA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • PPA has not raised any objections or claims relating to the activity. • CAPL has provided PPA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Western Rock Lobster Council (WRLC)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with WRLC on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • WRLC has not raised any objections or claims relating to the activity. • CAPL has provided WRLC with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

1.4.2 Tourism and recreation operators

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Tourism Western Australia (TWA)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with TWA on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • TWA has not raised any objections or claims relating to the activity. • CAPL has provided TWA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

1.4.3 Other

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Australian Conservation Foundation (ACF)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with ACF on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • ACF has not raised any objections or claims relating to the activity. • CAPL has provided ACF with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Centre for Whale Research Western Australia (CWR)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with CWR on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • CWR has not raised any objections or claims relating to the activity. • CAPL has provided CWR with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
Conservation Council of WA (CCWA)	25/09/2025	002591	Email	CAPL provided CCWA with the latest "Bulletin," outlining CAPL ongoing EPs. This included an overview of this EP. The Bulletin provides a detailed overview of proposed activities, including descriptions, location maps, timing, potential impacts, and the schedule for formal consultation. CAPL encouraged CCWA to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002822	Email	CAPL provided CCWA with the December Bulletin outlining CAPL ongoing EPs. This included an overview of this EP. CAPL encouraged CCWA to review the document and share any feedback or questions. CAPL welcomed the opportunity to provide further information and offered briefings with technical specialists and subject matter experts.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL provided a briefing on the activity ahead of formal consultation period on 26 November 2025 advising that CCWA had been identified as a relevant person with			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				functions, interests or activities that may be affected by the activity. CAPL has also included access to NOPSEMA's consultation guideline, which describes their right to request information not to be published. • CAPL provided CCWA with the Bulletin newsletter on 25 September 2025 and 17 December 2025, providing further information on the activity and the opportunity for further briefings. • CCWA has not raised any objections or claims relating to the activity. • CAPL has provided CCWA with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Greenpeace	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Summary: • CAPL commenced consultation with Greenpeace on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • Greenpeace has not raised any objections or claims relating to the activity. • CAPL has provided Greenpeace with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25.. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
International Fund for Animal Welfare (IFAW)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Summary: • CAPL commenced consultation with IFAW on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • IFAW has not raised any objections or claims relating to the activity. • CAPL has provided IFAW with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25.. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Pilbara Development Commission (PDC)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Summary: • CAPL commenced consultation with PDC on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • PDC has not raised any objections or claims relating to the activity. • CAPL has provided PDC with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
WA Coastal and Marine Community Network (WACMCN)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Summary: • CAPL commenced consultation with WACMCN on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • WACMCN has not raised any objections or claims relating to the activity. • CAPL has provided WACMCN with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
WA Marine Science Institute (WAMSI)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				Summary: • CAPL commenced consultation with WAMSI on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • WAMSI has not raised any objections or claims relating to the activity. • CAPL has provided WAMSI with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Western Australian Museum (WAM)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	21/01/2026	002886	Email	WAM provided CAPL with input on the EP. WAM raised the following: • Requirements under the *Underwater Cultural Heritage Act 2018* (Cth)	WAM raised the following: • Requirements under the *Underwater Cultural Heritage Act 2018* (Cth) • Guidelines for *Assessing and*	**Claims have merit**: The feedback raised by WAM is considered relevant.	No change made to the EP. The requirements of the *Underwater Cultural Heritage Act 2018* (Cth) and the guideline for *Assessing and Managing Impacts to*

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• Guidelines for Assessing and Managing Impacts to Underwater Cultural Heritage (UCH) in Australian Waters and associated requirements • Recommended UCH desktop assessment • Recommended consulting with DCCEEW and Traditional Owners.	*Managing Impacts to Underwater Cultural Heritage in Australian Waters* and associated requirements • Recommended UCH desktop assessment • Recommended consulting with DCCEEW and Traditional Owners.		*Underwater Cultural Heritage in Australian Waters* are captured within the EP (Section 5 and Section 8). A desktop analysis was undertaken to determine the presence of UCH within the EMBA (Section 5.6.2). Both DCCEEW and Traditional Owners have been engaged with over the course of the consultation period for this EP. CAPL thanked WAM for their response and acknowledged the input received (Record ID: 002887).
	21/01/2026	002887	Email	CAPL thanked WAM for response, feedback, and recommendations.	No objection or claim raised		
	22/01/2026	002892	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with WAM on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • WAM has not raised any objections or claims relating to the activity. WAM raised the requirements of the *Underwater Cultural Heritage Act 2018* (Cth) and relevant guidelines. They also suggested a desktop UCH assessment, and consulting DCCEEW and Traditional Owners. These requirements and suggestions are addressed within the EP.			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• CAPL has provided WAM with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Whale and Dolphin Conservation (WDC) *Note: Formerly Whale and Dolphin Conservation Society*	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with WDC on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity.			

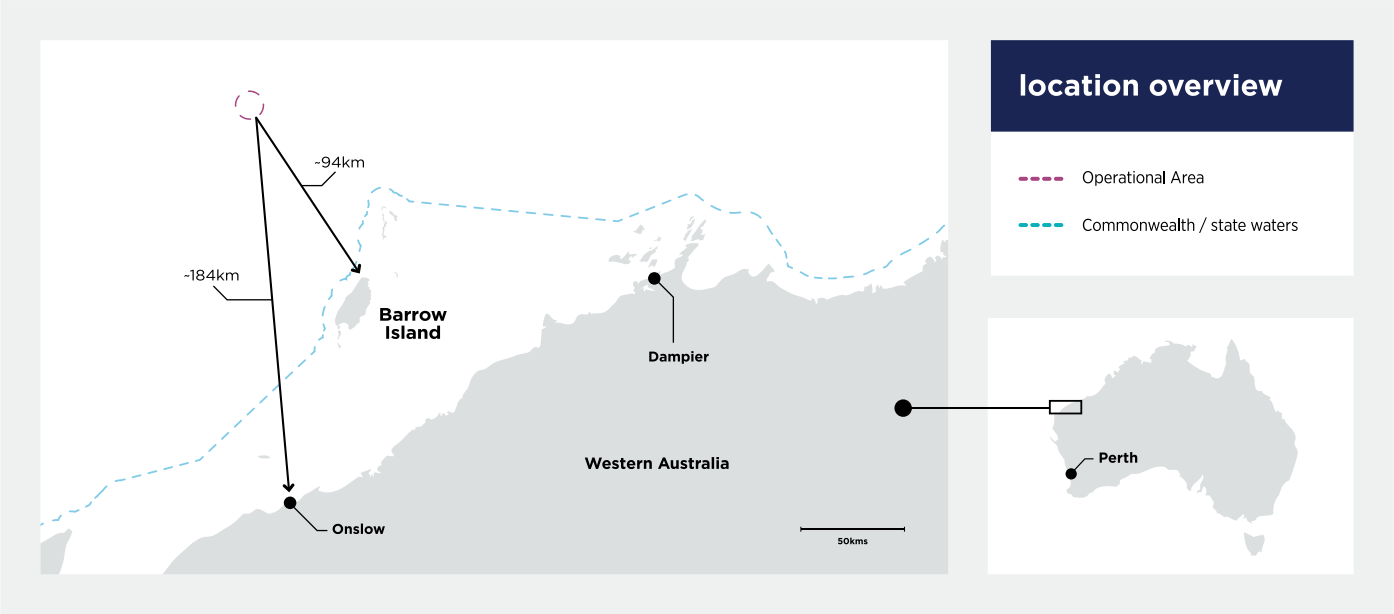
Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				• WDC has not raised any objections or claims relating to the activity. • CAPL has provided WDC with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			
Wilderness Society (WS)	26/11/2025	002723	Email	Notification of consultation launch sent via email. CAPL provided a written notification of the proposed activities and provided an information sheet and a link to CAPLs consultation webpage.	No objection or claim raised		
	26/11/2025	002760	Email	CAPL received automated response confirming receipt of email.	No objection or claim raised		
	17/12/2025	002796	Email	CAPL sent follow up email requesting feedback on the EP information. CAPL received automated response confirming receipt of email.	No objection or claim raised		
	17/12/2025	002797	Email	CAPL sent follow up email requesting feedback on the EP information.	No objection or claim raised		
	07/01/2026	002846	Email	CAPL sent follow up email requesting feedback on the EP information. No response was received.	No objection or claim raised		
	21/01/2026	002889	Email	CAPL advised the consultation period for the EP has closed.	No objection or claim raised		
				Summary: • CAPL commenced consultation with WS on 26 November 2025 via email advising they had been identified as a relevant person with functions, interests or activities that			

Relevant Person	Interaction Date	Record ID	Method	Summary	Objection or Claim	Assessment of Merit	Changes made to EP in response to consultation
				may be affected by the activity. CAPL provided an overview of the activity and provided a link to their website for further information regarding the activity. • WS has not raised any objections or claims relating to the activity. • CAPL has provided WS with sufficient information and a reasonable period in accordance with Sections 7.6 and 7.7 of the EP to make an informed assessment of the possible consequences of the activity on its functions, interests and activities. -CAPL has discharged its obligations under regulation 25. CAPL notes that further feedback may be received as part of ongoing consultation. CAPL will consider any feedback provided in the future (Section 10.3.4.1).			

Appendix F Consultation material

information sheet

gorgon stage 3 drilling



overview

Chevron Australia, on behalf of the Gorgon Joint Venture, operates the Gorgon Project, located off the northwest coast of Western Australia (WA).

Since 2015, as part of the first phase of the Gorgon Project (the Gorgon Foundation Project), offshore production wells, in-field infrastructure, and production pipelines have gathered hydrocarbons (natural gas and condensate) from the Gorgon and Jansz-Io gas fields and transported it to the Gorgon Gas Treatment Plant (the Gas Plant) on Barrow Island.

Hydrocarbons are processed at the Gas Plant for export as liquefied natural gas (LNG) or piped to the mainland for WA domestic gas users.

The existing Gorgon Project environmental approvals envisaged the development of backfill fields as supply from the Gorgon and Jansz-Io fields depleted over time.

This next phase of the Gorgon Project, the Backfill Fields Development, comprises the production of natural gas from seven backfill fields: Chandon, Chrysaor, Dionysus, Eurytion, Geryon, Semele, and West Tryal Rocks. The seven backfill fields will be developed or co-developed over multiple stages.

These backfill fields will connect to Gorgon Foundation Project infrastructure in order to maintain current rates of production at the Gas Plant on Barrow Island.

The development of the seven backfill fields is described within the Gorgon Backfill Fields Offshore Project Proposal (OPP), which was accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) in October 2025. After an OPP is accepted, further consultation must be undertaken, and an Environment Plan (EP) must also be in place before an offshore petroleum activity can commence.

The first of the backfill fields to be developed are the Geryon and Eurytion (G&E) gas fields, referred to as **Gorgon Stage 3** (GS3).

Chevron Australia is currently developing the Gorgon Stage 3 Drilling Environment Plan (the GS3 Drilling EP), which will be submitted to NOPSEMA for assessment and acceptance.

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The installation of other GS3 infrastructure, and tie-in (connection) to Jansz-Io infrastructure, which will allow for the transport of G&E hydrocarbons through the existing Jansz Feed Gas Pipeline to the Gas Plant, is within scope of a separate EP[1].

This information sheet is intended to assist 'relevant persons' to make an informed assessment of the potential environmental impacts and risks of our activities and to provide input and feedback to enhance the development of the GS3 Drilling EP.

Relevant persons are those whose functions, interests or activities may be affected by our activities. This includes Traditional Owners and Custodians with a spiritual and cultural connection to Country, commercial and recreational fishing, tourism, and individuals or groups in local communities.

Please note: in the context of an EP, each of the following is considered part of the 'environment':

- an ecosystem and their constituent parts, including people and communities
- natural and physical resources
- the qualities and characteristics of locations, places and areas
- the heritage value of places
- the social, economic and cultural features of the above.

activity summary

The petroleum activity covered by the GS3 Drilling EP includes:

- drilling and completion of six new subsea production wells (including installation of horizontal subsea trees) within the G&E fields
- inspection, maintenance, and repair (IMR) activities, if they are required to occur prior to GS3 commissioning, start-up and operations
- general field support operations (e.g. use of vessels, helicopters, Remotely Operated Vehicles (ROVs) or Autonomous Underwater Vehicles (AUVs) to support the above activities).

subsea production wells

A drillship or semi-submersible mobile offshore drilling unit (MODU) will drill and complete six subsea production wells. The MODU will use dynamic positioning (onboard thrusters controlled by a computer system) to maintain location without anchors. During drilling, the MODU has limited movement capability.

A standard drilling method will be followed, where each section of the well is drilled, cased, and cemented across all six wells before progressing to the next section. Water-based drilling fluids will be used, with non-aqueous drill fluids (NADFs) used as a contingency, if required.

During top-hole drilling, discharges (e.g. drill cuttings, drilling fluids, cement slurry) will occur near the seabed.

After top-hole drilling, a blowout preventer (BOP) and riser are installed. This creates a closed circulation system, allowing cuttings and fluids to be returned to the MODU for treatment. Recovered drilling fluids will be reused and cuttings and unrecoverable fluids discharged.

The BOP also serves as a critical safety barrier against loss of containment.

A horizontal subsea tree (HXT) will be installed over each of the wellheads. Once the HXTs are installed and drilling is finished, completions are run. Well completions include installing tubing and safety valves to prepare the well for future production.

Once the wells are successfully drilled and completed, they will be suspended until future commissioning and operation phases[2].

Note: Final well design and drilling methods will be defined within the Well Operations Management Plan, which must also be accepted by NOPSEMA before activities can commence.

general field support operations

Other general operational activities at the MODU include bunkering (refuelling) or bulk transfer of supplies (e.g. fuel and chemicals), and use of the helipad to transport workers.

[1] A separate information sheet and consultation period with relevant persons will be undertaken for the GS3 Pipelay, Subsea Installation, and Pre-commissioning EP in 2026.

[2] A separate EP will be prepared for commissioning, start-up and operation phases for GS3.

Up to two support vessels may be within the OA during drilling activities (e.g. for resupply or general support). An ROV/AUV may also be deployed from either the MODU or vessels.

inspection, maintenance and repair (IMR)

IMR activities are not planned to occur during the in-force period of the GS3 Drilling EP; however, they are included as a contingency, if required.

IMR activities may range from visual inspections from a vessel with an ROV/AUV to well interventions from a MODU or light well intervention vessel.

simultaneous operations (SIMOPS)

There will likely be other petroleum activities occurring at the same time as the GS3 drilling campaign. These SIMOPS may be associated with other GS3 activities (e.g. pipelay) or with other Chevron Australia activities (e.g. Jansz-Io Compression Project).

All SIMOPS will be managed in accordance with Chevron Australia procedures, and potential environmental impacts and risks (e.g. underwater sound) will be described and evaluated within the GS3 Drilling EP.

location and water depths

The G&E gas fields are located off the northwest coast of WA, ~184 kilometres (km) from Onslow and ~205 km from Dampier.

The six new subsea production wells will be clustered around a single drill centre within retention lease WA-22-R[3], in water depths of ~1,221 metres (m), and ~94 km northwest of Barrow Island.

Table 1 provides indicative top-hole locations for the G&E production wells.

The Operational Area (OA) in which the petroleum activity will be undertaken is defined as an ~5 km radius buffer around the indicative top-hole locations for the G&E wells. The OA occurs within WA-22-R and WA-15-R.

Figure 1 and Figure 2 show the location of the OA.

Table 1: Indicative top-hole locations and water depths for G&E production wells

Well	Water depth	Coordinates (GDA94)	
		Latitude	Longitude
GE-1B	~1,221 m	19°56'24.08" S	114°53'03.67" E
GE-1C	~1,221 m	19°56'23.91" S	114°53'04.82" E
GE-1D	~1,221 m	19°56'24.87" S	114°53'05.04" E
GE-1E	~1,221 m	19°56'26.76" S	114°53'07.91" E
GE-1F	~1,221 m	19°56'26.63" S	114°53'08.96" E
GE-1G	~1,221 m	19°56'27.55" S	114°53'09.29" E

schedule and duration

GS3 drilling and completions are indicatively scheduled to commence from early-2027 and will take ~12-18 months to complete. The drilling and completions may occur as a single campaign or over multiple campaigns.

This timing is indicative and subject to MODU/vessel, infrastructure or equipment availability, SIMOPS schedules, delays caused by weather events, and other unforeseen factors.

The petroleum activity can occur 24 hours per day and 7 days per week.

safe navigation area

Marine notices will be issued prior to drilling activities commencing within the OA. The notices will include a request to other marine users for a 500 m safe navigation area (temporary exclusion) around the MODU.

No permanent exclusion zones will be sought for the new production wells.

environment that may be affected (EMBA)

As part of our environmental assessment and consultation process, Chevron Australia creates maps to provide geographical context for relevant persons to determine if their functions, interests or activities may be affected by an offshore petroleum activity during planned activities (e.g. routine or

[3] The WA-22-R and WA-20-R retention leases will be converted to production licences prior to commencement of the petroleum activity. This process is administered by the National Offshore Petroleum Titles Administrator (NOPTA).

contingency operations) or from an unplanned event (e.g. emergency scenarios).

The majority of the environmental impacts or risks arising from planned activities would occur within, or within proximity of, the OA. However, for unplanned events the geographical extent may be much broader.

Figure 2 shows the EMBA, which is based on worst-case unplanned hydrocarbon release (oil spill) scenarios resulting from either a vessel collision or loss of well control event.

The EMBA has been defined through combining multiple oil spill model simulations for the unplanned release scenarios under different weather and ocean conditions. This means that in the highly unlikely event an unplanned release does occur, a geographical area much smaller than the EMBA would be affected.

Chevron Australia has systematic control measures to prevent and mitigate emergencies, and to reduce the impact and risks of planned activities on the environment, including to ecological, social and cultural sensitivities.

Table 2 summarises the potential impacts and risks and proposed control measures to manage these to levels that are as low as reasonably practicable (ALARP) and acceptable.

marine fauna and biologically important areas (BIAs)

Chevron Australia has undertaken environmental and modelling studies and considered scientific advice and government guidance (including conservation management and recovery plans) in assessing potential impacts and risks to marine fauna.

As with most offshore areas in WA, a range of marine species are likely to be present or transit through the OA and EMBA. Marine fauna may include various mammals (whales, dolphins), fishes (including sharks and rays), reptiles (turtles, sea snakes), seabirds and shorebirds species.

Some of these marine fauna species are also protected (listed as threatened and/or migratory) under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth [Cth]).

BIAs are areas used by protected marine species for carrying out critical life functions (e.g. reproduction, feeding, migration, resting).

The OA occurs within the migration BIA for the pygmy blue whale. An Adaptive Management Framework [Appendix 1] will be implemented to manage potential risks of underwater sound from GS3 and SIMOPS activities, such that they are not inconsistent with the Conservation Management Plan for the Blue Whale.

The OA also intersects the breeding BIA for the wedge-tailed shearwater.

The other closest BIAs include the interesting buffer BIA for flatback turtles, foraging BIA for whale sharks, and the migration BIA for humpback whales, located ~19 km, ~20 km, and ~48 km respectively from the OA.

The closest nesting habitats for turtle, seabird or shorebird species are Montebello Islands and Barrow Island, ~47 km and ~58 km respectively from the OA.

The broader EMBA intersects with the BIAs for:

- mammals—pygmy blue, humpback, and southern right whales, dugong
- reptiles—flatback, green, hawksbill, and loggerhead turtles
- fishes—whale shark
- seabird and shorebirds—fairy, lesser crested, and roseate terns, and wedge-tailed shearwater.

cultural values

Chevron Australia acknowledges that Traditional Owners and Custodians in the northwest region of WA have expressed a cultural and spiritual connection to Sea Country. This encompasses an obligation to protect cultural values and features — including songlines, dreaming stories, and the flora and fauna connected to them (tangible and intangible).

We are committed to ongoing engagement and consultation with relevant groups to help protect these cultural values. This process will continue to inform our understanding and help facilitate the co-design of appropriate controls to avoid impacts.

Chevron Australia's Cultural Heritage Management System (CHMS) sets out processes and procedures to manage risks to cultural heritage, and Chevron

Australia's obligations under relevant legislation including the *Aboriginal Heritage Act 1972* (WA) and the *Underwater Cultural Heritage Act 2018* (Cth).

The CHMS includes governance of field surveys and monitoring, spatial data, compliance and assurance, heritage assessment, inadvertent discovery procedures, incident management, training and induction materials.

approvals process

Petroleum activities in Commonwealth waters are regulated by NOPSEMA. Before petroleum activities can take place, Chevron Australia must develop an EP which will be assessed by NOPSEMA in accordance with the requirements of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023 (the Regulations).

The Regulations require us to consult with relevant persons whose functions, interests and activities may be affected by the petroleum activity.

Following consultation, we will submit the GS3 Drilling EP to NOPSEMA, which will:

- describe the petroleum activity;
- describe the environment that may be affected by the petroleum activity;
- identify and assess potential environmental impacts and risks arising from the petroleum activity;
- identify control measures to manage the potential environmental impacts and risks to levels that are ALARP and acceptable; and
- outline how Chevron Australia has engaged with relevant persons and how their feedback has been considered and addressed.

NOPSEMA will assess whether the EP satisfies the Regulations, including whether the environmental impacts and risks of the petroleum activity will be managed so that they are ALARP and acceptable before accepting the EP.

your input

We are now seeking your feedback and input if you consider your functions, interests, or activities may be affected based on the information provided, including the summary of the potential environmental impacts and risks identified to date in Table 2.

We encourage you to provide additional details about the environment, aspects, potential impacts and risks of the activity, or key proposed control measures or to ask for further information or consultation by 20 January 2026.

You can contact us with any questions, requests for information, or feedback at:

- 1800 225 195
- australia.chevron.com/feedback
- or scan the QR code

To subscribe to Chevron Australia consultation email or text message updates relating to our proposed activities, please visit go.chevron.com/subscriptions

Relevant persons may request that the information they provide be treated as confidential. Chevron Australia will make this known to NOPSEMA and it will be identified as sensitive information and not published in the EP.

what's next

The feedback we receive during consultation will be used to inform and enhance the EP before it is submitted to NOPSEMA for assessment.

We commit to keeping you informed and providing responses to any relevant person who so requests.

privacy notice

If you choose to provide feedback on this proposal, Chevron Australia will collect your name and contact details, in addition to your comments, for the purposes of maintaining contact with you and inclusion of your feedback in our submission to NOPSEMA. Provision of this information is purely voluntary, however if you choose not to provide it, we may not be able to contact you in the future regarding your submission. Chevron Australia may transfer your information to NOPSEMA, if required and if you do not identify it as sensitive, and to other Chevron affiliates including our head office based in the United States. For further information regarding how we protect your personal information, and your rights, please refer to our privacy notice at australia.chevron.com/privacy

Figure 1: GS3 Drilling—Operational Area and Indicative Production Well Locations

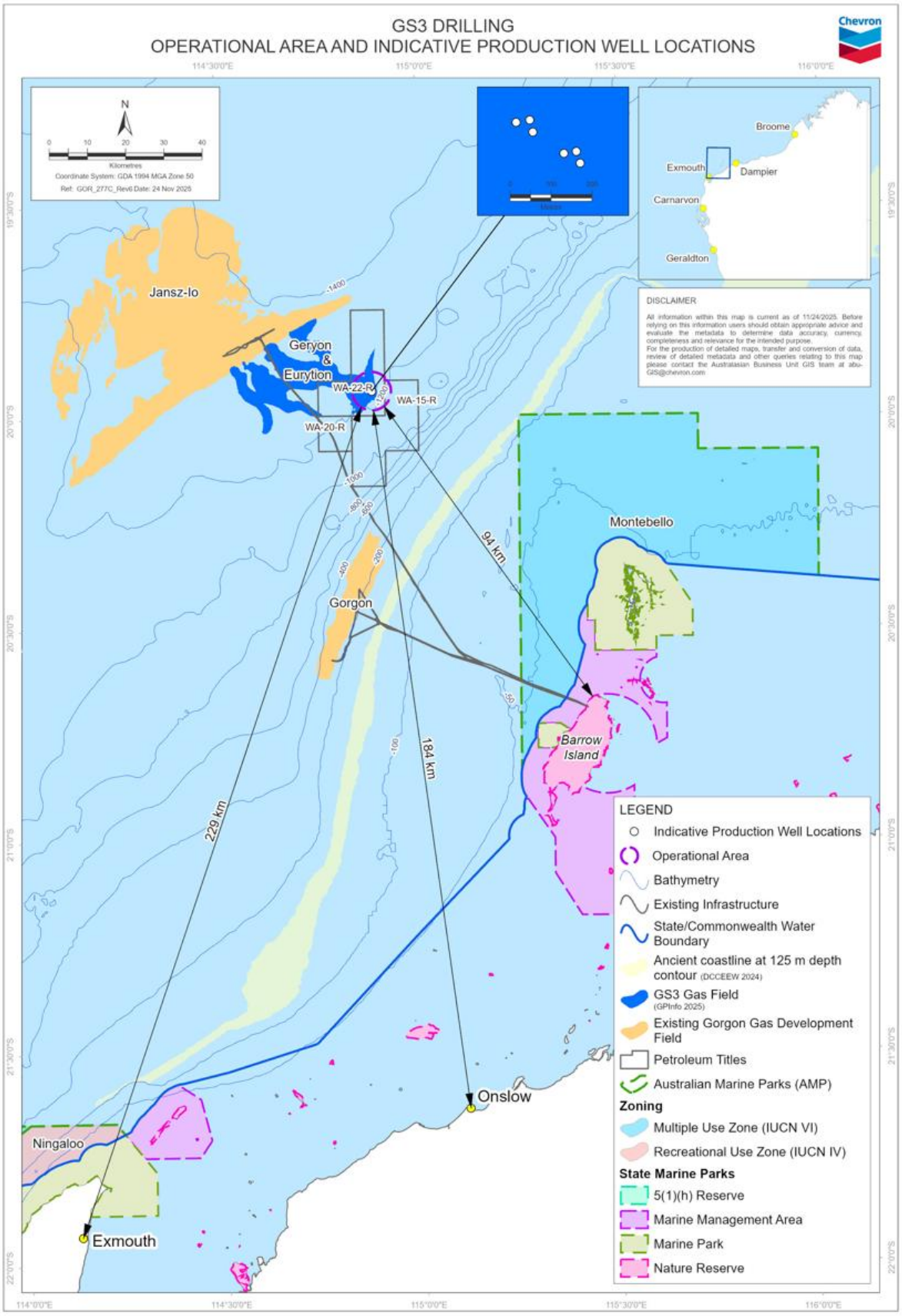

Figure 2: GS3 Drilling - Environment that May Be Affected (EMBA)

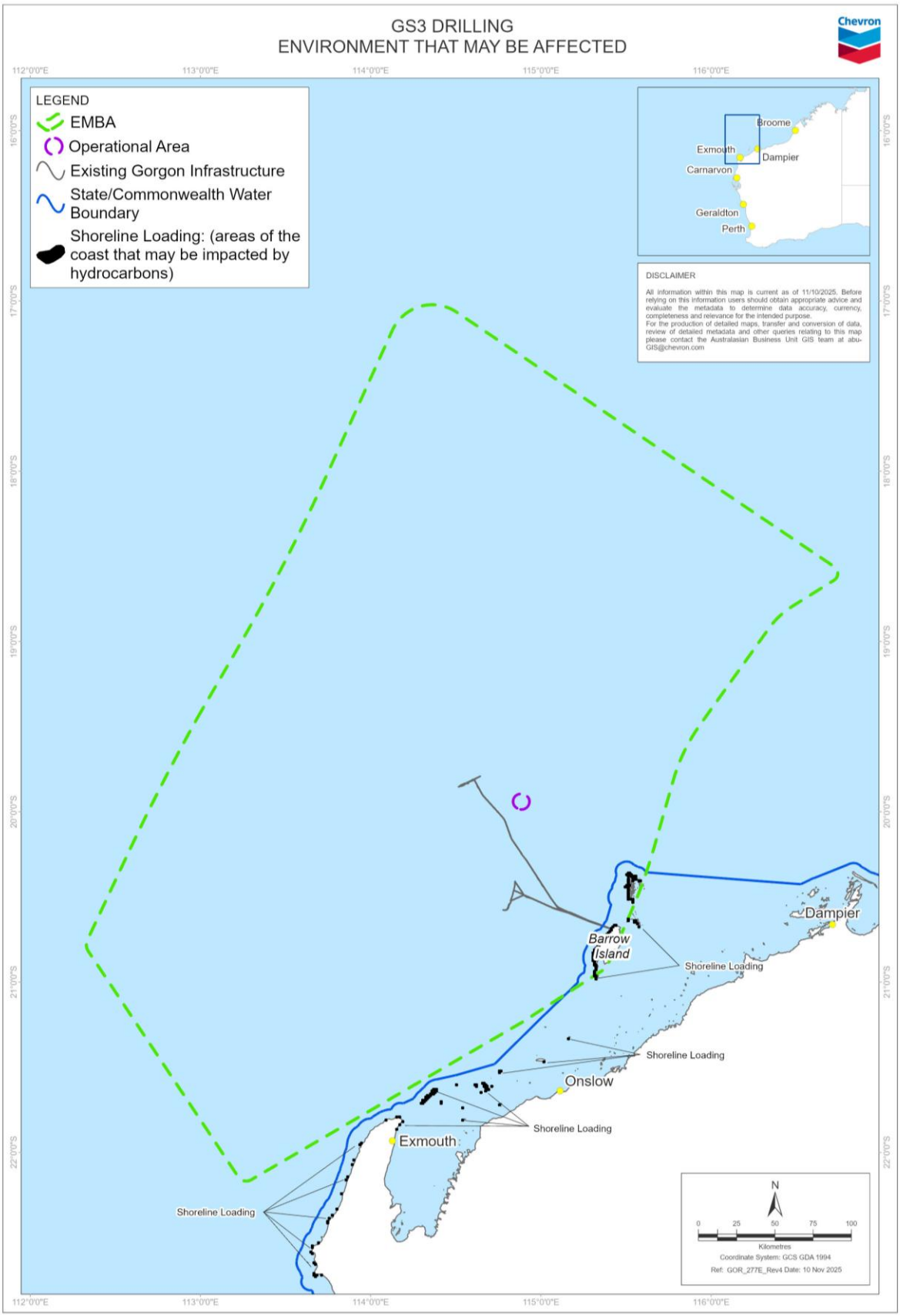

Table 2: Summary of potential impacts and risks and proposed control measures

Aspect[4] (and key sources)	Potential impact or risk	Key proposed control measures[5]
Community—Cultural heritage *Note: Other aspects identified in this table below (e.g. seabed disturbance) could have potential impacts or pose potential risks to cultural heritage, with the proposed key control measures listed here also applicable.*	• Potential adverse effects to Underwater Cultural Heritage (UCH) sites and/or artefacts (tangible cultural heritage). • Potential interference with Sea Country values (intangible cultural heritage), including songlines, dreaming stories and culturally important marine fauna.	• Implement Chevron Australia's Inadvertent Underwater Cultural Heritage Discovery Procedure, including processes for notification and response to suspected discoveries. ○ Discovery of suspected UCH is reported to the Minister within 21 days of discovery as per section 40 of the *Underwater Cultural Heritage Act 2018* (Cth). • Ongoing consultation with Traditional Owners and Custodians and/or representative bodies is undertaken as per the respective engagement plan and/or consultation protocols. • Any new information on cultural values or features identified during ongoing consultation will be incorporated into GS3 Environment Plans. *Key control measures related to marine fauna and other potential cultural values and features are outlined in aspect sections below.*
Planned activities		
Physical presence—Interaction with other marine users • temporary presence of the MODU, vessels, helicopters within the OA • long-term presence of subsea infrastructure (wellhead, HTX) within the OA.	• A potential change to the functions, interests, and activities of other marine users.	• Vessels operating within the OA will comply with any Notice to Mariners requirements under the *Navigation Act 2012* (Cth). • Vessels operating within the OA will comply with the requirements of Marine Order 27 in relation to navigation and radio equipment. • Vessels operating within the OA will comply with the requirements of Marine Order 28 in relation to watchkeeping. • Chevron Australia will develop and implement SIMOPS Plan(s) to manage the GS3 drilling activity and other Chevron Australia petroleum activities that may occur concurrently within the vicinity of the OA. • Chevron Australia will comply with any Notice to Mariners requirements under the *Navigation Act 2012* (Cth) regarding notifications of installed subsea infrastructure.
Physical presence—Seabed disturbance • well spudding and subsea tree installation • short-term disturbance due to temporary presence of equipment (e.g. clump weights, acoustic positioning equipment's, ROV/AUV).	• A localised and temporary change in water quality. • A localised change to benthic habitats and communities.	• Seabed surveys of proposed well locations have been undertaken to inform indicative well locations, such that they avoid any emergent seabed features or other obstacles wherever practicable within technical and safety constraints. • A visual inspection of the seabed will be undertaken prior to well spudding activities commencing.

[4] An element of the petroleum activity that has the potential to interact with the environment (e.g. an emission or discharge).
[5] Proposed control measures are subject to change through consultation with relevant persons and the subsequent NOPSEMA assessment process.

Aspect[4] (and key sources)	Potential impact or risk	Key proposed control measures[5]
Planned discharges—Drilling • includes a variety of discharge types from drilling operations; e.g. drill cuttings, drilling fluids, cement, completion fluids • discharges may be near-seabed or near-surface.	• A localised and temporary change in water quality and sediment quality. • A localised change to benthic habitats and communities. • Potential adverse effects (e.g. toxicity) to marine fauna.	• Planned discharges to the marine environment are subject to selection and environmental assessment as per Chevron Australia's Hazardous Materials Management Procedure. • Where selected for use, NADFs are managed in accordance with Chevron Australia's Wells Fluid Field Guidelines Offshore. • Mercury and cadmium concentrations in stock barite will be limited to a maximum of 1 mg/kg and 3 mg/kg dry weight respectively. • Chevron Australia will implement their management process for unused bulk product (barite, cement, and bentonite).
Planned discharges—MODU and vessels • includes a variety of discharge types from general operations; e.g. sewage, greywater, food wastes, cooling water, deck wash-water, bilge water • discharges in near-surface water.	• A localised and temporary change in water quality.	• Vessels operating within the OA will comply with the requirements of Marine Order 91 (MARPOL 73/78 Annex I) in relation to oily bilge water discharges. • Vessels operating within the OA will comply with the requirements of Marine Order 95 (MARPOL 73/78 Annex V) in relation to food waste discharge. • Vessels operating within the OA will comply with the requirements of Marine Order 96 (MARPOL 73/78 Annex IV) in relation to sewage discharge. • Planned discharges to the marine environment are subject to selection and environmental assessment as per Chevron Australia's Hazardous Materials Management Procedure.
Planned emissions—Atmospheric • fuel use from MODU, vessels, and helicopters • flaring or venting (if required)	• A localised and temporary change in air quality.	• Vessels operating within the OA will comply with requirements of Marine Order 97 (MARPOL 73/78 Annex VI) in relation to air pollution.
Planned emissions—Greenhouse gas (GHG) • fuel use from MODU, vessels, and helicopters • flaring or venting (if required)	• A potential reduction to the Intergovernmental Panel on Climate Change (IPCC) estimated remaining carbon budget to limit global warming to 1.5–2.0°C.	• Chevron Australia will comply with the Australian Government's Safeguard Mechanism scheme in relation to greenhouse gas emissions. • Vessels operating within the OA will comply with requirements of Marine Order 97 (MARPOL 73/78 Annex VI) in relation to air pollution.
Planned emissions—Artificial light • navigation and operational lighting from MODU and vessels • flaring (if required)	• A localised and temporary change in ambient light. • A potential temporary change in the behaviour of marine fauna.	• Vessels operating within the OA will comply with the requirements of Marine Order 30 in relation to the use of navigation lights. • MODU and vessels working at night will be required to reduce external lighting to the minimum required for safe operations and navigation.
Planned emissions—Underwater sound • use of MODU, vessels, and helicopters • drilling operations.	• A localised and temporary change in ambient underwater sound.	• Vessels under transit within the OA will implement caution and no approach zones as described in sections 8.05 and 8.06 of Part 8, Division 8.1 (Interacting with cetaceans) of the EPBC Regulations 2000 (Cth).

Aspect[4] (and key sources)	Potential impact or risk	Key proposed control measures[5]
	• A potential temporary change in the behaviour of marine fauna. • A potential for auditory impairment or injury in marine fauna.	• Helicopters under transit within the OA will operate in alignment with section 8.07 of Part 8, Division 8.1 (Interacting with cetaceans) of the EPBC Regulations 2000 (Cth). • The Adaptive Management Framework for pygmy blue whales [Appendix 1] will be applied to the GS3 drilling activity and any concurrent Chevron Australia petroleum activities.
Unplanned events		
Unplanned disturbance: Fauna interaction • temporary presence of the MODU, vessels, helicopters within the OA.	• Injury or death of an individual marine fauna due to an unplanned interaction (e.g. vessel strike).	• Vessels under transit within the OA will implement caution and no approach zones as described in sections 8.05 and 8.06 of Part 8, Division 8.1 (Interacting with cetaceans) of the EPBC Regulations 2000 (Cth). • Helicopters under transit within the OA will operate in alignment with section 8.07 of Part 8, Division 8.1 (Interacting with cetaceans) of the EPBC Regulations 2000 (Cth).
Unplanned disturbance: Seabed disturbance • dropped objects (e.g. equipment, infrastructure) within the OA.	• Potential change to benthic habitats and communities. • Potential adverse effects (e.g. injury, entanglement) to marine fauna.	• Develop and implement a Lift Plan (or equivalent) for the petroleum activity. • Dropped equipment will be retrieved wherever practicable within operational and safety constraints.
Introduction of invasive marine pests • planned ballast water exchange from MODU or vessels within the OA • presence and unplanned release of biofouling from MODU, vessels or equipment within the OA.	• A potential introduction and establishment of an invasive marine pest which may subsequently result in effects to benthic habitats and communities.	• Vessels operating within the OA will comply with ballast water management as required under the *Biosecurity Act 2015* (Cth) and best practice guidance within the Australian Ballast Water Management Requirements. • Vessels operating within the OA will comply with biofouling management as required under the *Biosecurity Act 2015* (Cth) and best practice guidance within the Australian Biofouling Management Requirements. • Vessels operating within the OA will comply with requirements within Marine Order 98 in relation to anti-fouling systems.
Unplanned release: Solid waste • inappropriately handled or stored solid waste.	• Potential change to benthic habitats and communities. • Potential adverse effects (e.g. injury, entanglement) to marine fauna.	• Vessels operating within the OA will comply with requirements within Marine Order 95 (MARPOL 73/78 Annex V) in relation to waste management.
Unplanned release: Leaks and spills • bunkering or bulk transfers • use, handling, and transfer of hazardous materials	• Potential adverse effects (e.g. toxicity) to marine fauna.	• Develop and implement a Bunkering and Bulk Transfer Procedure (or equivalent) for the petroleum activity. • Vessels operating within the OA will comply with the requirements of Marine Order 91 in relation to having an approved Ship Oil Pollution Emergency Plan (SOPEP) in place.
Unplanned release: Vessel collision	• An unplanned hydrocarbon release may result in effects to marine	• Vessels operating within the OA will comply with any Notice to Mariners requirements under the *Navigation Act 2012* (Cth).

Aspect[4] (and key sources)	Potential impact or risk	Key proposed control measures[5]
• a vessel collision event may occur due to loss of DP, navigational error, or floundering due to weather, and result in a surface release of marine fuel.	fauna, smothering of subtidal or intertidal habitats, indirect impacts to fisheries, and/or changes in amenity.	• Vessel crew will hold a current Standards of Training, Certification and Watchkeeping for Seafarers (or equivalent) certificate as appropriate to duties. • Vessels operating within the OA will comply with the requirements of Marine Order 27 in relation to navigation and radio equipment. • Vessels operating within the OA will comply with the requirements of Marine Order 28 in relation to watchkeeping. • Vessels operating within the OA will comply with the requirements of Marine Order 30 in relation to prevention of collisions at sea. • Vessels operating within the OA will comply with the requirements of Marine Order 91 in relation to having an approved Ship Oil Pollution Emergency Plan (SOPEP) in place. • Oil spill response will be implemented in accordance with the SOPEP and arrangements and strategies described in Chevron Australia's Oil Pollution Emergency Plan (OPEP). • Operational and scientific monitoring will be implemented in accordance with Chevron Australia's Operational and Scientific Monitoring Plan (OSMP).
Unplanned release: Loss of well control • a loss of well control event may occur due to hydrocarbon influx, breach of well fluids to surface, or loss of well barriers, and result in a subsea release of gas and condensate.	• An unplanned hydrocarbon release may result in effects to marine fauna, smothering of subtidal or intertidal habitats, indirect impacts to fisheries, and/or changes in amenity.	• A NOPSEMA-accepted Well Operations Management Plan (WOMP) will be in place prior to the commencement of the petroleum activity. • Pressure control equipment will be used during drilling in accordance with the NOPSEMA-accepted WOMP. • Certifications as required by Chevron Corporation's Wellsafe Standard Operating Procedure will be in place prior to commencement of the petroleum activity. • A Source Control Emergency Response Plan (SCERP) will be in place prior to the commencement of the petroleum activity. • Oil spill response will be implemented in accordance with the SCERP and the arrangements and strategies described in Chevron Australia's OPEP. • Operational and scientific monitoring will be implemented in accordance with Chevron Australia's OSMP.
Oil spill response		
Oil spill response— Dispersant use • response may be implemented in the event of a subsea oil spill to support response objectives and minimise potential environmental impacts.	• Chemical dispersant application may result in effects to marine fauna or benthic habitats.	• Oil spill response will be implemented in accordance with the SCERP and the arrangements and strategies described in Chevron Australia's OPEP. • Operational and scientific monitoring will be implemented in accordance with Chevron Australia's OSMP.

Aspect[4] (and key sources)	Potential impact or risk	Key proposed control measures[5]
Oil spill response—Shoreline spill response • response may be implemented in the event of an oil spill which results in oil accumulation on a shoreline.	• Implementing shoreline clean-up techniques will involve people and equipment, which may disturb shoreline habitats and fauna.	• Oil spill response will be implemented in accordance with the arrangements and strategies described in Chevron Australia's OPEP. • Operational and scientific monitoring will be implemented in accordance with Chevron Australia's OSMP.
Oil spill response—Oiled wildlife response • response may be implemented in the event of an oil spill which results in oil exposure to marine fauna.	• Implementing oiled wildlife response will require personnel to interact with fauna, which may cause further harm.	• Oil spill response will be implemented in accordance with the arrangements and strategies described in Chevron Australia's OPEP. • Operational and scientific monitoring will be implemented in accordance with Chevron Australia's OSMP.

Appendix 1: Adaptive Management Framework for Pygmy Blue Whales exposed to underwater sound emissions from the Gorgon Backfill Fields Development

Please note: The following description is adapted from the framework as described in Section 10.4 of the Gorgon Gas Development: Backfill Fields Offshore Project Proposal (OPP). The framework also refers to other relevant sections, tables, and documents in the OPP. The full OPP can be accessed here.

purpose

This adaptive management framework is designed to ensure the control measures developed and implemented during the Gorgon Backfill Field Development's (the Development's) petroleum activities are effective in managing the potential risks of underwater sound emissions on pygmy blue whales such that the residual risk is consistent with the relevant acceptable levels and environmental performance outcomes (EPOs) established for the Development. This framework for pygmy blue whales works in conjunction with the broader **CM-20** and **CM-21** for marine fauna (Table 8-57).

In relation to underwater sound emissions and the potential risks to pygmy blue whales, the relevant acceptable levels (Table 7-6) and EPOs (Table 8-57) that have been developed to manage the Development's petroleum activities such that they are not inconsistent with the Conservation Management Plan for the Blue Whale (Ref. 20) are:

- **AL-12**: Impacts from the Development will not interfere with the recovery of the population of an EPBC Act listed threatened species
- **AL-13**: Impacts from the Development will not be inconsistent with the requirements of threatened species recovery plans made or adopted under the EPBC Act
- **EPO-17**: Sound emissions from planned Development activities will be managed such that EPBC Act listed species continue undertaking biological important behaviours[6]
- **EPO-19**: Any blue whale continues to utilise the biologically important area without injury[7], and is not displaced from a foraging area[8,9]
- **EPO-23**: Implement an adaptive management approach (**CM-20**, **CM-21**) for underwater sound emissions from the Development such that it can be demonstrated that risks have been reduced to as low as reasonably practicable and can be managed to meet acceptable levels. The outcomes of this adaptive management approach will be incorporated into Environment Plans for the petroleum activities associated with this Development.

key sensitivities and considerations

Based on information available at the time of writing this OPP, key sensitivities and considerations for evaluating potential risk to pygmy blue whales within the vicinity of the DA include:

[6] Where biologically important behaviours are defined as behaviour associated with critical life functions (e.g. reproduction, foraging, migration, and resting) (Ref. 719).
[7] For the purpose of Action A.2.3 from the Conservation Management Plan for the Blue Whale (Ref. 20) 'injury to blue whales' is considered both permanent threshold shift (PTS) and temporary threshold shift (TTS) and any other form of physical harm arising from anthropogenic sources of underwater sound (Ref. 369).
[8] For the purpose of Action A.2.3 from the Conservation Management Plan for the Blue Whale (Ref. 20) 'displaced from a foraging area' applies in relation to biologically important areas (BIAs) (Ref. 369); and these BIAs correspond to 'Foraging Area', 'Possible Foraging Area', and 'Known Foraging Area' as illustrated in Figure 1 of the Conservation Management Plan for the Blue Whale (Ref. 20; Ref. 369). There are no Foraging Area BIAs within or adjacent to the Development Area (DA).
[9] In accordance with Australian Government guidance, activities outside designated Foraging Areas should adopt adaptive management approaches in the event that indicators (e.g. aggregation in a particular area) of whale foraging are evident to ensure that impacts are not unacceptable (e.g. no injury or biologically significant disturbance) (Ref. 369). EPO-17 incorporates foraging as one of the biologically important behaviours of marine fauna, and EPO-23 applies adaptive management.

- the DA overlaps with the migration BIA
  - studies indicate that the migration corridor used during the northern migration is broader than the migration BIA
  - presence within the north-bound migration corridor in the vicinity of the DA is not evenly distributed—with higher presence detected along the inshore edge of the BIA (at the continental shelf edge) and further offshore beyond the BIA, compared to the central area of the BIA
  - studies indicate that the southern migration predominantly occurs further offshore than the BIA
- presence of pygmy blue whales in the vicinity of the DA has been observed
  - late-March to mid-September (peak late-May to June) during northern migration
  - early-October to late-January (peak late-November to early-December) during southern migration
  - however, this presence of migratory whales varies temporally and spatially each year
- the DA and surrounding area are not considered to represent a Foraging Area, but may provide opportunistic foraging if the environmental conditions provide for the aggregation of prey at sufficient quantities at the time a pygmy blue migrates through the area
  - if opportunistic foraging does occur, this is likely to occur within surface waters (e.g. photic zone).

The above key sensitivities and considerations are sourced from the description of pygmy blue whales in Section 6.3.3.1.2; refer to this section for further details and scientific studies/literature sources.

risk-based approach

Consistent with the approach within Chevron Corporation's Environment Risk Management Process (Ref. 492; see also Section 10.3.3.1), this adaptive management framework for pygmy blue whales adopts a risk-based approach to managing environmental risks. That is, safeguards (control measures) are developed commensurate to the nature and scale of the risk (e.g. there may be greater risk reduction and/or different controls required during peak north-bound migration versus south-bound migration, or during concurrent petroleum activities versus an individual petroleum activity, etc.).

sources of uncertainty

At the time of writing this OPP, detailed information on the staging of field developments is not yet available (Section 4.1.4), but this will become available as the field developments progress through design stages. It was also noted in Section 8.5.3.1.1 that some of the analogue source levels for mobile offshore drilling unit (MODU)/vessels used in the acoustic and animal behaviour modelling to inform the risk evaluation in the OPP are likely over-conservative, which would subsequently overestimate the predicted ensonified areas. This framework is intended to address these and other key areas of uncertainty in managing the risk of underwater sound emissions on pygmy blue whales, including:

- activity-specific schedules for the Development (and any overlap with other Chevron Australia petroleum activities)
- predictions of ensonified areas (e.g. including estimation of the sound source level, effect-criteria, inputs into animal movement modelling, etc.)

- the behavioural response and physiological effects on pygmy blue whales from exposure to underwater sound
- the implications/consequences of these effects to pygmy blue whale individuals or populations
- detection methods for biologically important behaviours (e.g. foraging versus migrating) of pygmy blue whales within vicinity of the DA
- changes to and/or new regulatory requirements in relation to the management of underwater sound and pygmy blue whales.

New information related to these areas of uncertainty is likely to become available over the life of the Development. The implementation of an adaptive management framework allows Chevron Australia to incorporate new information at the time of a specific petroleum activity and to develop safeguards commensurate to the environmental risk.

framework

The management of environmental risks from the Development's underwater sound emissions to pygmy blue whales follows these key steps:

- prediction of potential worst-case credible consequence
- application of the environmental mitigation hierarchy to guide the selection of safeguards such that the environmental risk can be demonstrated to be
    - reduced to ALARP
    - managed to a level consistent with the EPOs (and therefore equal to or better than the acceptable levels)
- implementation of monitoring and adaptive management commensurate to the nature and scale of the risk.

Given the staged field developments for the backfill fields, the framework can be applied at both the specific petroleum activity and broader Development level. An overview of the adaptive management framework is provided in Figure 10-3.

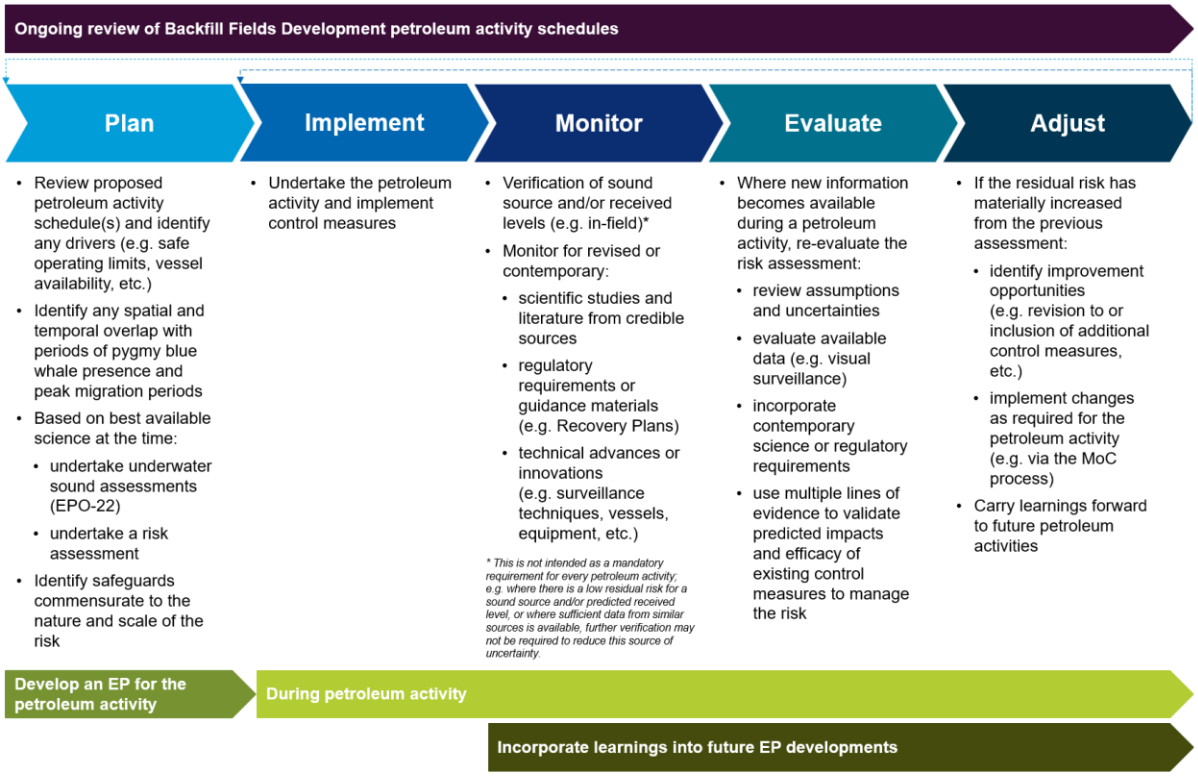

Figure 10-3: Overview of adaptive management framework

The Environment Risk Assessment and Management Procedure (Ref. 493) adopts an environmental mitigation hierarchy based on the International Petroleum Industry Environmental Conservation Association (IPIECA) mitigation hierarchy (Ref. 765). The application of the environmental mitigation hierarchy identifies opportunities to limit potential negative impacts on environmental receptors of concern. The two preventative mitigation steps are:

- **avoid**—measures taken to anticipate and prevent potential negative impacts before actions or decisions are taken that could lead to such impacts
- **reduce**—measures taken to reduce the duration, intensity, significance and/or extent of potential impacts (including direct, indirect, and cumulative impacts, as appropriate) that cannot be completely avoided.

Under the Environment Risk Assessment and Management Procedure, application of the mitigation hierarchy is required for a potential consequence of Minor or above (see Table 7-4 for consequence descriptions from Chevron Corporation's Integrated Risk Prioritization Matrix).

Figure 10-4 provides an extended overview of the 'plan' stage of the framework, including undertaking a risk assessment and applying the environmental mitigation hierarchy to ensure that the residual risk is consistent with the relevant acceptable levels and EPOs established for the Development.

To assist in the application of the environmental mitigation hierarchy a preliminary toolbox of potential safeguards has been collated in Table 10-2. The types of safeguards presented in the toolbox are based on Chevron Australia's operational experience on the North West Shelf and Chevron Australia's involvement in national and international working groups related to the management of underwater sound. It is expected that this toolbox will be revised over time as new information and/or new technologies become available.

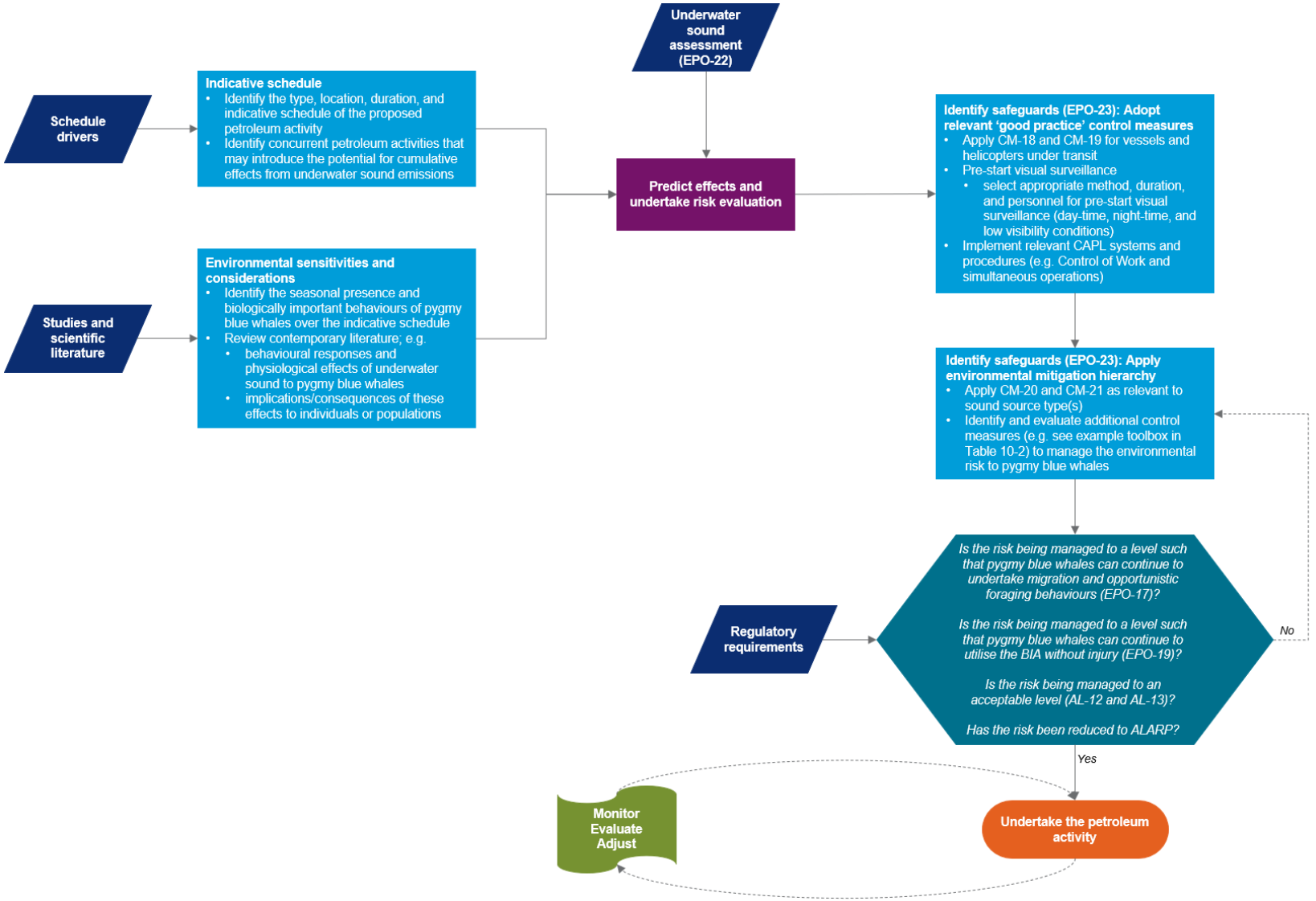

Figure 10-4: Expanded overview of 'plan' with application of the environmental mitigation hierarchy

Table 10-2: Toolbox of example safeguards for managing the environmental risk from underwater sound to pygmy blue whales

Hierarchy	Example types of control measures that may be considered
Avoid	• Temporal avoidance (e.g. avoid activities during predicted peak periods of north-bound migration)
Reduce	• Reduce spatial exposure within migration BIA (e.g. adjust activity schedules[10], if operationally feasible and practicable, to reduce or remove concurrent activities) • Reduce temporal exposure during peak sensitivity periods (e.g. adjust activity schedules [as above] to reduce or remove concurrent activities; reduce activities to day-time operations during predicted peak periods of north-bound migration, etc.) • MODU/vessel selection • Position-holding selection (e.g. anchoring in place of DP) • Equipment (e.g. geophysical) selection • Separation distances (e.g. for vessels or helicopters under transit) • Speed limits (e.g. for vessels under transit) • Use of operating procedures, e.g. – ongoing visual surveillance within an observation zones[11] during the petroleum activity (e.g. by bridge-watch, dedicated Marine Fauna Observers, passive monitoring equipment, etc.) to advise of presence/behaviour of pygmy blue whales – adjust activity[12] (e.g. pause activity, reduce DP, change position, etc.) if pygmy blue whale foraging behaviour[13] is observed within action zone[11] – use of soft-starts and/or shut-down zones for impulsive (e.g. vertical seismic profiling [VSP]) sound sources – activity re-start procedures

implementation of the framework in environment plans

It is intended that this adaptive management framework for pygmy blue whales is applied to the subsequent suite of Environment Plans (EPs) required for the Development. As each EP is developed, this framework may be refined and revised (e.g. to incorporate new science, technology, regulatory requirements, etc.), and changes will be described in the EPs.

[10] The ability to adjust schedules is dependent on the type of activity and any schedule drivers (e.g. safe operating [metocean] conditions, vessel or equipment availability, integrity management for inspection, maintenance, and repair [IMR], etc.).
[11] The development, spatial extent, and use of any management zones (e.g. observation, action, shut-down) will be commensurate with the sound source and risk being managed.
[12] These in-field decisions to adjust an activity are the responsibility of the Vessel Master (or equivalent), and would only be implemented where it is considered operationally safe and technically feasible.
[13] In-field observations of actual whale feeding are difficult to detect, so indicators of probable foraging (e.g. aggregating in a particular area) may be used as a proxy (Ref. 369). The type of indicator, or ability to detect actual feeding behaviours, may change over the life of the Development with advancement in science and technology.

relevant persons information

gorgon stage 3 drilling

Chevron Australia, on behalf of the Gorgon Joint Venture, operates the Gorgon Project, located off the northwest coast of Western Australia (WA).

Since 2015, as part of the first phase of the Gorgon Project (the Gorgon Foundation Project), offshore production wells, in-field infrastructure, and production pipelines have gathered hydrocarbons (natural gas and condensate) from the Gorgon and Jansz-Io gas fields and transported it to the Gorgon Gas Treatment Plant (the Gas Plant) on Barrow Island.

Hydrocarbons are processed at the Gas Plant for export as liquefied natural gas (LNG) or piped to the mainland for WA domestic gas users.

The existing Gorgon Project environmental approvals envisaged the development of backfill fields within the Greater Gorgon Area as supply from the Gorgon and Jansz-Io fields depleted over time.

This next phase of the Gorgon Project, the Backfill Fields Development, comprises the production of natural gas from seven backfill fields within the Greater Gorgon Area: Chandon, Chrysaor, Dionysus, Eurytion, Geryon, Semele, and West Tryal Rocks. The seven backfill fields will be developed or co-developed over multiple stages.

These backfill fields will connect to Gorgon Foundation Project infrastructure in order to maintain current rates of production at the Gas Plant on Barrow Island.

The development of the seven backfill fields is described within the Gorgon Backfill Fields Offshore Project Proposal (OPP), which was accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) in October 2025. After an OPP is accepted, further consultation must be undertaken, and an Environment Plan (EP) must also be in place before an offshore petroleum activity can commence.

The first of the backfill fields to be developed are the Geryon and Eurytion (G&E) gas fields, referred to as **Gorgon Stage 3** (GS3).

Chevron Australia is currently developing the Gorgon Stage 3 Drilling Environment Plan (the GS3 Drilling EP), which will be submitted to NOPSEMA for assessment and acceptance.

The installation of other GS3 infrastructure, and tie-in (connection) to Jansz-Io infrastructure, which will allow for the transport of G&E hydrocarbons through the existing Jansz Feed Gas Pipeline to the Gas Plant, is within scope of a separate EP [1].

This information sheet is intended to assist 'relevant persons' to make an informed assessment of the potential environmental impacts and risks of our activities and to provide input and feedback to enhance the development of the GS3 Drilling EP.

Relevant persons are those whose functions, interests or activities may be affected by our activities. This includes Traditional Owners and Custodians with a spiritual and cultural connection to Country, commercial and recreational fishing, tourism, and individuals or groups in local communities.

Please note: in the context of an EP, each of the following is considered part of the 'environment':

- an ecosystem and their constituent parts, including people and communities
- natural and physical resources
- the qualities and characteristics of locations, places and areas
- the heritage value of places

- the social, economic and cultural features of the above.

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[1] A separate information sheet and consultation period with relevant persons will be undertaken for the GS3 Pipelay, Subsea Installation, and Pre-commissioning EP in 2026.

activity summary

The petroleum activity covered by the GS3 Drilling EP includes:

- drilling and completion of six new subsea production wells (including installation of horizontal subsea trees) within the G&E fields
- inspection, maintenance, and repair (IMR) activities, if they are required to occur prior to GS3 commissioning, start-up and operations
- general field support operations (e.g. use of vessels, helicopters, Remotely Operated Vehicles (ROVs) or Autonomous Underwater Vehicles (AUVs) to support the above activities).

subsea production wells

A drillship or semi-submersible mobile offshore drilling unit (MODU) will drill and complete six subsea production wells. The MODU will use dynamic positioning (onboard thrusters controlled by a computer system) to maintain location without anchors. During drilling, the MODU has limited movement capability.

A standard drilling method will be followed, where each section of the well is drilled, cased, and cemented across all six wells before progressing to the next section. Water-based drilling fluids will be used, with non-aqueous drill fluids (NADFs) used as a contingency, if required.

During top-hole drilling, discharges (e.g. drill cuttings, drilling fluids, cement slurry) will occur near the seabed.

After top-hole drilling, a blowout preventer (BOP) and riser are installed. This creates a closed circulation system, allowing cuttings and fluids to be returned to the MODU for treatment. Recovered drilling fluids will be reused and cuttings and unrecoverable fluids discharged.

The BOP also serves as a critical safety barrier against loss of containment.

A horizontal subsea tree (HXT) will be installed over each of the wellheads. Once the HXTs are installed and drilling is finished, completions are run. Well completions include installing tubing and safety valves to prepare the well for future production.

Once the wells are successfully drilled and completed, they will be suspended until future commissioning and operation phases [2].

Note: Final well design and drilling methods will be defined within the Well Operations Management Plan, which must also be accepted by NOPSEMA before activities can commence.

general field support operations

Other general operational activities at the MODU include bunkering (refuelling) or bulk transfer of supplies (e.g. fuel and chemicals), and use of the helipad to transport workers.

Up to two support vessels may be within the OA during drilling activities (e.g. for resupply or general support). An ROV/AUV may also be deployed from either the MODU or vessels.

inspection, maintenance and repair (IMR)

IMR activities are not planned to occur during the in-force period of the GS3 Drilling EP; however, they are included as a contingency, if required.

IMR activities may range from visual inspections from a vessel with an ROV/AUV to well interventions from a MODU or light well intervention vessel.

simultaneous operations (SIMOPS)

There will likely be other petroleum activities occurring at the same time as the GS3 drilling campaign. These SIMOPS may be associated with other GS3 activities (e.g. pipelay) or with other Chevron Australia activities (e.g. Jansz-Io Compression Project).

All SIMOPS will be managed in accordance with Chevron Australia procedures, and potential environmental impacts and risks (e.g. underwater sound) will be described and evaluated within the GS3 Drilling EP.

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[2] A separate EP will be prepared for commissioning, start-up and operation phases for GS3.

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location and water depth



The G&E gas fields are located off the northwest coast of WA, approximately 184 kilometres (km) from Onslow and ~205 km from Dampier.

The six new subsea production wells will be clustered around a single drill centre within retention lease WA-22-R [3], in water depths of ~1,221 metres (m), and ~94 km northwest of Barrow Island.

Table 1 provides indicative top-hole locations for the G&E production wells.

The Operational Area (OA) in which the petroleum activity will be undertaken is defined as a 5 km radius buffer around the indicative top-hole locations for the G&E wells.

Figure 1 and Figure 2 show the location of the OA.

Jump to detailed maps below

[3] This retention lease will be converted to a production licence prior to commencement of the petroleum activity. This process is administered by the National Offshore Petroleum Titles Administrator (NOPTA).

schedule and duration

GS3 drilling and completions are indicatively scheduled to commence from early-2027 and will take approximately 12-18 months to complete. The drilling and completions may occur as a single campaign or over multiple campaigns.

This timing is indicative and subject to MODU/vessel, infrastructure or equipment availability, SIMOPS schedules, delays caused by weather events, and other unforeseen factors.

The petroleum activity can occur 24 hours per day and 7 days per week.

safe navigation area

Marine notices will be issued prior to drilling activities commencing within the OA. The notices will include a request to other marine users for a 500 m safe navigation area (temporary exclusion) around the MODU.

No permanent exclusion zones will be sought for the new production wells.

environment that may be affected (EMBA)

As part of our environmental assessment and consultation process, Chevron Australia creates maps to provide geographical context for relevant persons to determine if their functions, interests or activities may be affected by an offshore petroleum activity during planned activities (e.g. routine or contingency operations) or from an unplanned event (e.g. emergency scenarios).

The majority of the environmental impacts or risks arising from planned activities would occur within, or within proximity of, the OA. However, for unplanned events the geographical extent may be much broader.

Figure 2 shows the EMBA, which is based on worst-case unplanned hydrocarbon release (oil spill) scenarios resulting from either a vessel collision or loss of well control event.

The EMBA has been defined through combining multiple oil spill model simulations for the unplanned release scenarios under different weather and ocean conditions. This means that in the highly unlikely event an unplanned release does occur, a geographical area much smaller than the EMBA would be affected.

Chevron Australia has systematic control measures to prevent and mitigate emergencies, and to reduce the impact and risks of planned activities on the environment, including to ecological, social and cultural sensitivities.

Table 2 summarises the potential impacts and risks and proposed control measures to manage these to levels that are as low as reasonably practicable (ALARP) and acceptable.

marine fauna and biologically important areas (BIAs)

Chevron Australia has undertaken environmental and modelling studies and considered scientific advice and government guidance (including conservation management and recovery plans) in assessing potential impacts and risks to marine fauna.

As with most offshore areas in WA, a range of marine species are likely to be present or transit through the OA and EMBA. Marine fauna may include various mammals (whales, dolphins), fishes (including sharks and rays), reptiles (turtles, sea snakes), seabirds and shorebirds species.

Some of these marine fauna species are also protected (listed as threatened and/or migratory) under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth [Cth]).

BIAs are areas used by protected marine species for carrying out critical life functions (e.g. reproduction, feeding, migration, resting).

The OA occurs within the migration BIA for the pygmy blue whale. An Adaptive Management Framework [Appendix 1] will be implemented to manage potential risks of underwater sound from GS3 and SIMOPS activities, such that they are not inconsistent with the Conservation Management Plan for the Blue Whale.

The OA also intersects the breeding BIA for the wedge-tailed shearwater.

The other closest BIAs include the interesting buffer BIA for flatback turtles, foraging BIA for whale sharks, and the migration BIA for humpback whales, located ~19 km, ~20 km, and ~48 km respectively from the OA.

The closest nesting habitats for turtle, seabird or shorebird species are Montebello Islands and Barrow Island, ~47 km and ~58 km respectively from the OA.

The broader EMBA intersects with the BIAs for:

- mammals—pygmy blue, humpback, and southern right whales, dugong
- reptiles—flatback, green, hawksbill, and loggerhead turtles
- fishes—whale shark
- seabird and shorebirds—fairy, lesser crested, and roseate terns, and wedge-tailed shearwater.

cultural values

Chevron Australia acknowledges that Traditional Owners and Custodians in the northwest region of WA have expressed a cultural and spiritual connection to Sea Country. This encompasses an obligation to protect cultural values and features — including songlines, dreaming stories, and the flora and fauna connected to them (tangible and intangible).

We are committed to ongoing engagement and consultation with relevant groups to help protect these cultural values. This process will continue to inform our understanding and help facilitate the co-design of appropriate controls to avoid impacts.

Chevron Australia's Cultural Heritage Management System (CHMS) sets out processes and procedures to manage risks to cultural heritage, and Chevron Australia's obligations under relevant legislation including the *Aboriginal Heritage Act 1972* (WA) and the *Underwater Cultural Heritage Act 2018* (Cth).

The CHMS includes governance of field surveys and monitoring, spatial data, compliance and assurance, heritage assessment, inadvertent discovery procedures, incident management, training and induction materials.

approvals process

Petroleum activities in Commonwealth waters are regulated by NOPSEMA. Before petroleum activities can take place, Chevron Australia must develop an EP which will be assessed by NOPSEMA in accordance with the requirements of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023 (the Regulations).

The Regulations require us to consult with relevant persons whose functions, interests and activities may be affected by the petroleum activity.

Following consultation, we will submit the GS3 Drilling EP to NOPSEMA, which will:

- describe the petroleum activity;
- describe the environment that may be affected by the petroleum activity;
- identify and assess potential environmental impacts and risks arising from the petroleum activity;
- identify control measures to manage the potential environmental impacts and risks to levels that are ALARP and acceptable; and
- outline how Chevron Australia has engaged with relevant persons and how their feedback has been considered and addressed.

NOPSEMA will assess whether the EP satisfies the Regulations, including whether the environmental impacts and risks of the petroleum activity will be managed so that they are ALARP and acceptable before accepting the EP.

impacts, risks and proposed controls

A summary of potential impacts and risks and proposed control measures for GS3 Drilling can be viewed in Table 2.

your input

We are now seeking your feedback and input if you consider your functions, interests, or activities may be affected based on the information provided, including the summary of the key environmental impacts and risks identified to date in Table 2.

We encourage you to provide additional details about the environment, aspects, consequences of the activity or control measures or to ask for further information or consultation by **20 January 2026.**

You can contact us with any questions, requests for information, or to provide feedback by calling tollfree on **1800 225 195** or online below.

Relevant persons may request that the information they provide be treated as confidential. Chevron Australia will make this known to NOPSEMA and it will be identified as sensitive information and not published in the EP.

submit feedback here

what's next

The feedback we receive during consultation will be used to inform and enhance the EP before it is submitted to NOPSEMA for assessment.

We commit to keeping you informed and providing responses to any relevant person who so requests.

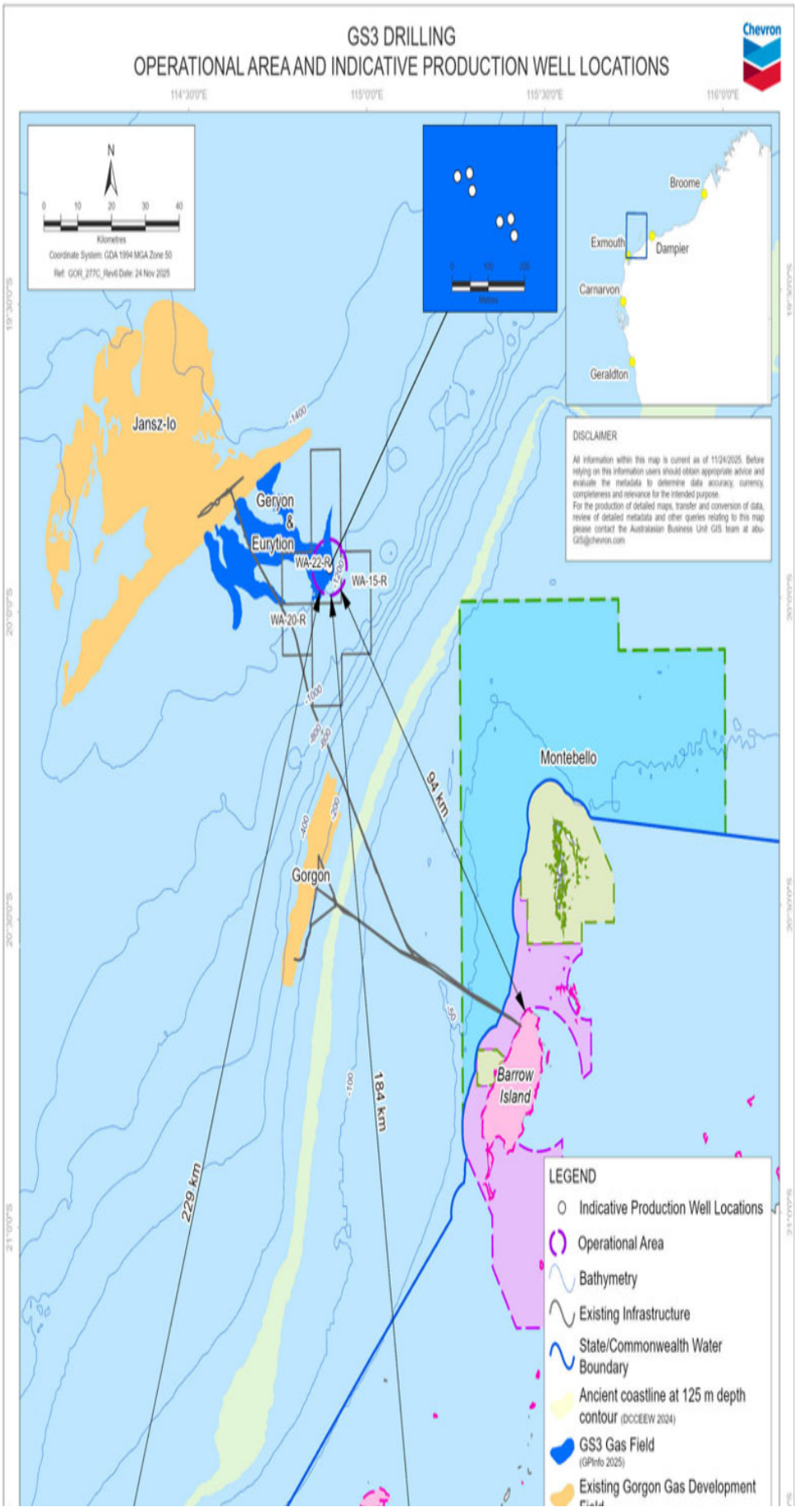
privacy notice

If you choose to provide feedback on this proposal, Chevron Australia will collect your name and contact details, in addition to your comments, for the purposes of maintaining contact with you and inclusion of your feedback in our submission to NOPSEMA. Provision of this information is purely voluntary, however if you choose not to provide it, we may not be able to contact you in the future regarding your submission. Chevron may transfer your information to NOPSEMA, if required and if you do not identify it as sensitive, and to other Chevron affiliates including our head office based in the United States. For further information regarding how we protect your personal information, and your rights, please refer to our privacy notice.

further information

detailed maps and tables

Figure 1: Operational Area and Indicative Production Well Locations.


GS3 DRILLING
OPERATIONAL AREA AND INDICATIVE PRODUCTION WELL LOCATIONS
Chevron
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Coordinate System: GDA 1994 MGA Zone 50
Ref: GOR_277C_Rev6 Date: 24 Nov 2025
Broome
Exmouth
Dampier
Carnarvon
Geraldton
DISCLAIMER
All information within this map is current as of 11/24/2025. Before relying on this information users should obtain appropriate advice and evaluate the metadata to determine data accuracy, currency, completeness and relevance for the intended purpose.
For the production of detailed maps, transfer and conversion of data, review of detailed metadata and other queries relating to this map please contact the Australasian Business Unit GIS team at abu-GIS@chevron.com
Jansz-Io
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Gorgon
Montebello
Barrow
Island
94 km
184 km
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LEGEND
Indicative Production Well Locations
Operational Area
Bathymetry
Existing Infrastructure
State/Commonwealth Water Boundary
Ancient coastline at 125 m depth contour (DCCEEW 2024)
GS3 Gas Field
(GPInfo 2025)
Existing Gorgon Gas Development

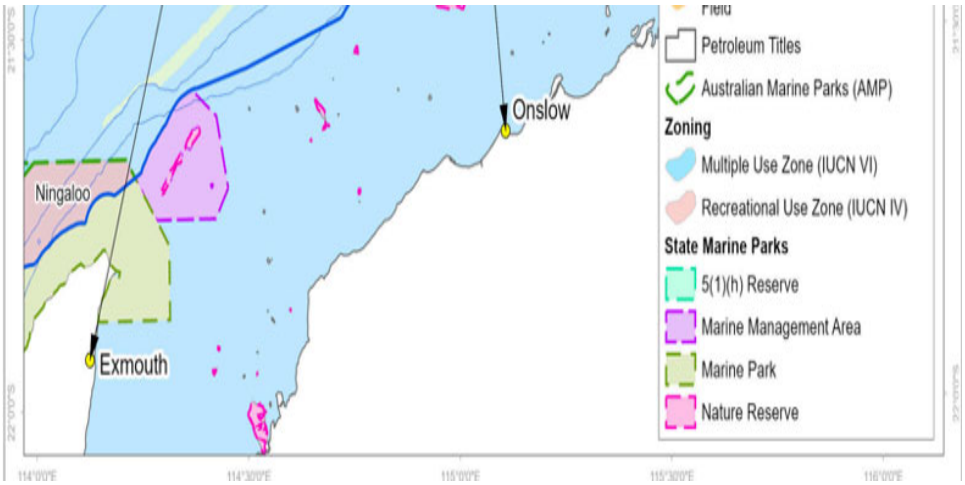
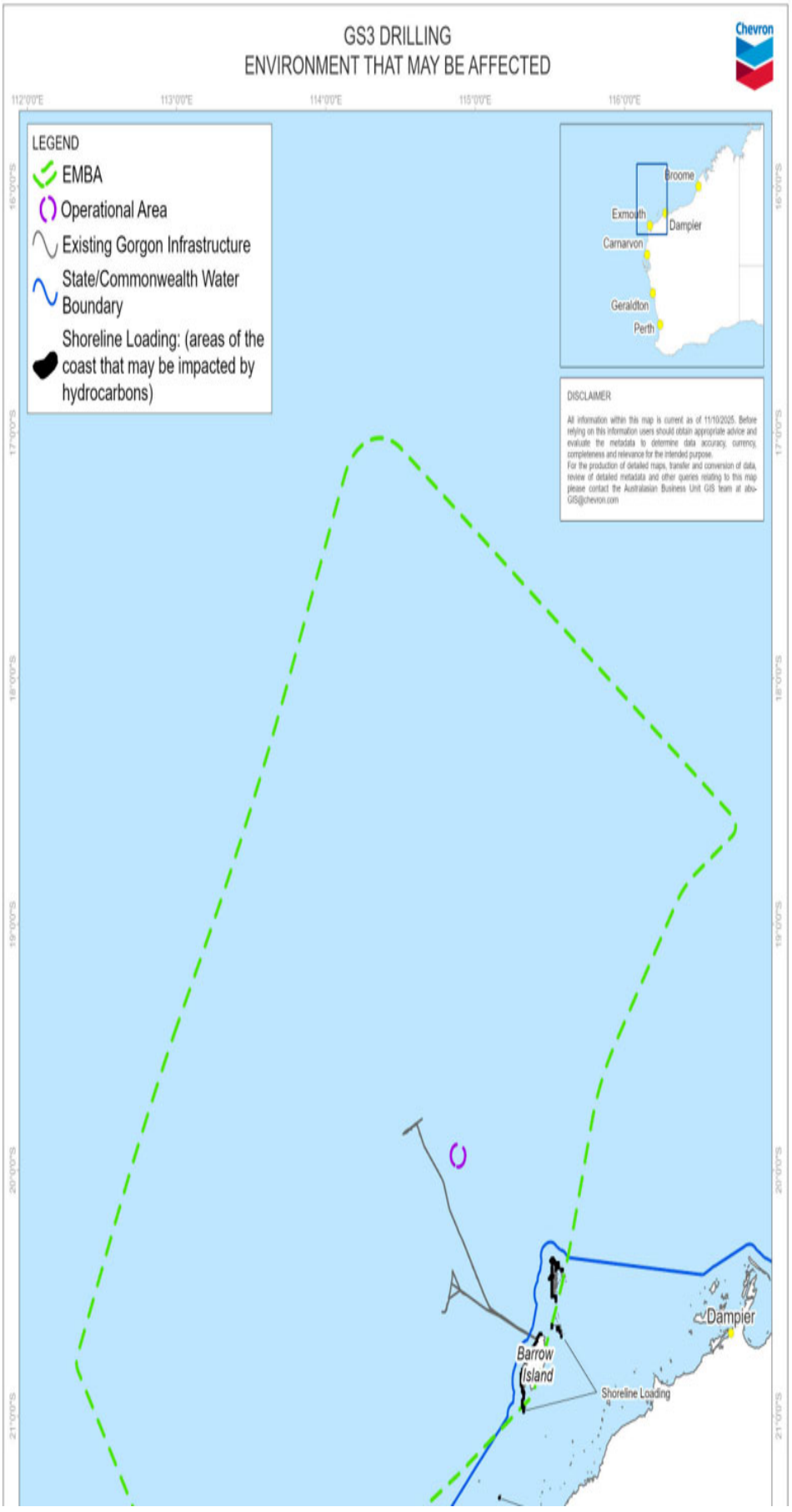


Figure 2: Environment that may be affected (EMBA).


GS3 DRILLING
ENVIRONMENT THAT MAY BE AFFECTED
Chevron
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LEGEND
EMBA
Operational Area
Existing Gorgon Infrastructure
State/Commonwealth Water Boundary
Shoreline Loading: (areas of the coast that may be impacted by hydrocarbons)
Broome
Exmouth
Dampier
Carnarvon
Geraldton
Perth
DISCLAIMER
All information within this map is current as of 11/10/2025. Before relying on this information users should obtain appropriate advice and evaluate the metadata to determine data accuracy, currency, completeness and relevance for the intended purpose.
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Dampier
Barrow Island
Shoreline Loading

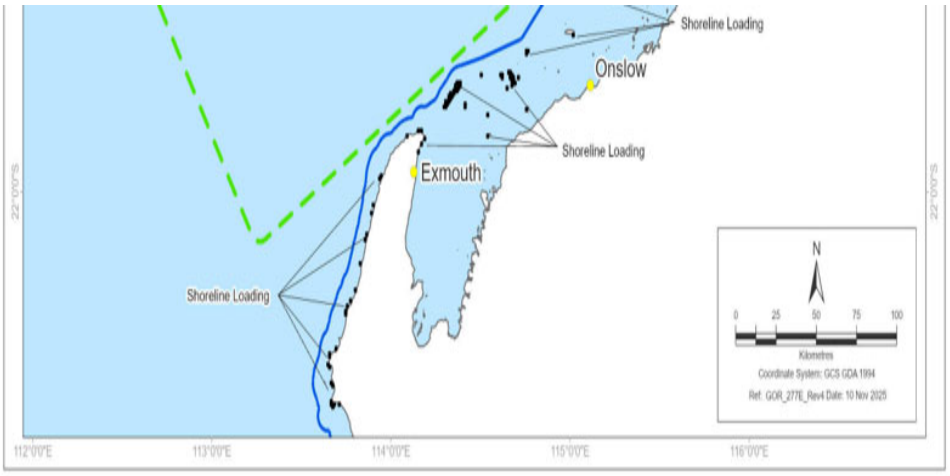

Table 1: Indicative top-hole locations and water depths for G&E production wells. – view here

Table 2: Summary of potential impacts and risks and proposed control measures for GS3 Drilling. – view here

Appendix 1: Adaptive Management Framework for Pygmy Blue Whales exposed to underwater sound emissions from the Gorgon Backfill Fields Development. – view here

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resources

GS3 Drilling - info sheet - October 2025

Consultation on Offshore Petroleum Environment Plans – NOPSEMA

Environment plan content requirements – NOPSEMA

Environmental requirements – NOPSEMA

Offshore Petroleum Greenhouse Gas Storage (Environment) Regulations

Chevron Operational Excellence Management System (OEMS)

Consultation in the course of preparing an environment plan – NOPSEMA

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December 2025

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Fashion after the flood

LIFESTYLE STARTS PAGE 9

YOUTH PRISON MUST CLOSE

Coroner's blast at inhumane conditions

RONAN O'CONNELL, NATASHA CLARK & GIOVANNI TORRE



Cleveland Dodd
Picture supplied by Nadene Dodd

Western Australia's troubled Unit 18 youth detention centre is dangerous and should be closed "as a matter of urgency", Coroner Philip Urquhart has warned as he released findings of the inquest into the death in custody of 16-year-old Yamatji boy Cleveland Dodd.

Mr Urquhart said Unit 18, the notorious youth unit within the maximum-security Casuarina Prison, was an unsafe environment for inmates when Cleveland's death occurred, and should be closed despite subsequent improvements.

He said Unit 18 staff on shift were not responsible for Cleveland's death, and found the main problem was Unit 18 was chronically understaffed, and had been for years.

Cleveland was found unresponsive in his cell early on October 12, 2023. The teenager died a week later after being kept on life support.

Cleveland had warned prison staff he intended to take his own life, the inquest noted. The staff asked him not to say such things. Thirteen minutes later, prison officers found him unresponsive in his cell, where the CCTV cameras had been covered by toilet paper for hours. That evening, Unit 18 staff several times rejected his request for a cup of water.

During his close to three months in custody Cleveland had repeatedly made threats of self-harm, but he had been removed from the prison's list of "at-risk" children. Cleveland had continually been denied time outdoors, having been inside for more than 22 hours a day during 74 of his 86 days at Unit 18.

Mr Urquhart described Cleveland's cell confinement as "deeply disturbing" and "inhumane". Cleveland would have felt "despair and despondency" due to these conditions, he said.

Adverse findings

The Coroner made 15 adverse findings against the Department of Justice. They included findings Unit 18 was unfit to adequately care for, treat and supervise detainees at high risk of self-harm; the failure to resolve the widespread practice of detainees covering their cell CCTV cameras for extended periods; the failure to remove Cleveland from a cell with an obvious ligature anchor point; the failure to place Cleveland on to its at-risk management system on the night of October 11, 2023; and the failure to have an adequate number of staff rostered for night shifts to ensure Unit 18 was operating safely.

Five months before Cleveland's death, Unit 18 had been exposed as having youths and staff in crisis by a May 2023 audit by WA Inspector of Custodial Services Eamon Ryan. Mr Ryan found rates of attempted suicide and self-harm in Unit 18 had reached unprecedented levels. Similar failures in WA's youth-justice system were uncovered by the coronial inquest into Cleveland's death, and also by a 2024 Corruption and Crime Commission investigation into his case. The CCC cleared prison staff of serious misconduct on the night Cleveland fatally self-harmed, but found Unit 18 was "trapped in a cycle of destruction", with its staff poorly equipped to assess the seriousness of frequent self-harm threats made by detained children.

Mr Urquhart noted Cleveland was the first death in WA of a child in custody, and described this inquest as the "saddest I have presided over".

The Coroner said no child in detention deserved to be treated the way Cleveland and other Unit 18 inmates were treated.

Intense boredom, lack of access to mental health services, education and even running water had become the norm for Cleveland and many fellow detainees, he said.

He faced 'unbearable physical and psychological pain'

Cleveland's mother Nadene Dodd issued a statement after the Coroner's findings. "The

CONTINUED PAGE 3

Giant's life dedicated to healing


Yurlu | Country, a legacy film of Maitland Parker, received the Walkley Documentary award. Pic: (Illuminate Films)

JARRED CROSS

This report contains the name of someone who has passed away.

The late Maitland Parker was a giant in his community and widely-respected Banjima Elder who dedicated his life to healing his home, 'poison Country' in the Pilbara.

Yurlu | Country, a moving and brave telling of his final year, intimate family moments and continued fight to clean up Country was recognised with the Walkey Documentary Award in late November.

Mr Parker passed from illness linked to the destruction of Banjima Country — mid-20th century mining of asbestos and three million tonnes of tailings left after the mining ceased.

Boyhood exposure resulted in Uncle Maitland ultimately growing ill with mesothelioma.

Aboriginal people in Western Australia have the highest incidence of mesothelioma in the world, the film explains, and his home Country is considered the largest contaminated site in the Southern Hemisphere.

Six decades have passed since the health of that Country, and community, changed forever.

"We have to look at avenues to be able to bring that message across, because this happened in my Elders' generation, and then as a young person as Banjima, you sit there and you think, 'Well, our Elders didn't have a say, but now we have some kind of say'," Mr Parker's niece Johnnell told National Indigenous Times during early preview screenings in August.

"Uncle Maitland highlighted that Country is sick and it is poisoned, and it's been poisoned for the last 60 years."

Ms Parker is also a director on the board of Banjima Native Title Aboriginal Corporation.

Already a five-time Walkley winner before the latest honour, Yaara Bou Melhem directed Yurlu | Country, with support of crew, including Indigenous members of the team, Tom Banningan, and distributed by Illuminate Films.

The late Mr Parker is credited as co-writer and executive producer.

The documentary came out ahead at the Walkleys in front of high-quality finalists The Palestine Laboratory from Al Jazeera English and Black Leaf Films, and the ABC with Wild Pacific Media's The Kimberley.

Ms Bou Melhem told National Indigenous Times:

"Maitland's story was so powerful. Not only was he trying to clean up and heal the largest contaminated site in the southern hemisphere, but it mirrored his own struggle with mesothelioma, something that he developed as a result of exposure to his Country," she said. "We wanted to work with him, and he wanted to work with us to really honour his story, honour the fight, and try to get this cleaned up for the next generation."

Ms Bou Melhem said Mr Parker and his family "bravely brought us into their lives so that together, we could bring this largely 'out of sight, out of mind' issue into full view".

"Receiving a Walkley, the highest honour in Australian journalism, is huge for propelling Banjima people's campaign to clean up Wittenoom on the national stage," she said.

Johnnell Parker, Mr Parker's wife Marjorie Hughes, and his daughters Coreen and Renira described their uncle, husband and father as a gentle and devoted family man.

environment plan

seeking relevant persons' input

Chevron

Chevron has been operating in Australia for more than 70 years – creating enduring benefits and delivering reliable, affordable energy. We welcome feedback to enhance our environmental management measures as we progress offshore activities to support the ongoing supply of natural gas to Western Australia and the Asia Pacific region.

our activities

Chevron Australia is planning to drill and complete six subsea production wells in the Geryon and Eurytion gas fields in Commonwealth waters, approximately 180 kilometres off the northwest coast of WA in water depths of approximately 1,200 metres. The drilling activities are indicatively scheduled to commence in early 2027 and are expected to take approximately 12 to 18 months to complete.

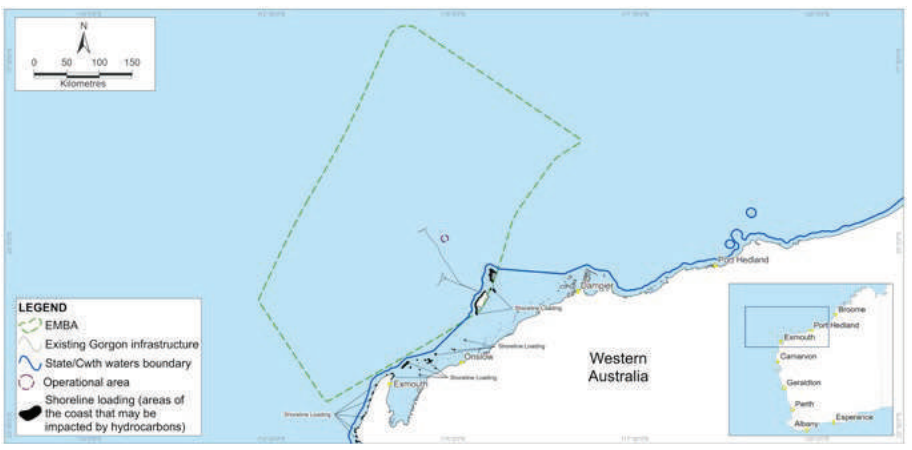
The feedback we receive during consultation will inform and enhance the Gorgon Stage 3 Drilling Environment Plan, which must be accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) before activities may commence.

environment that may be affected (EMBA)

As part of our environmental assessment and consultation process, we create maps to provide geographical context for relevant persons to determine if their functions, interests or activities may be affected by an offshore petroleum activity during planned activities (e.g. routine or contingency operations) or from an unplanned event (e.g. emergency scenarios).

The map shows the operational area (OA) which is a 5 km radius buffer around the indicative location of the wells, and the EMBA, which is based on worst-case unplanned hydrocarbon release (oil spill) scenarios resulting from either a vessel collision or loss of well control event.

The EMBA has been defined through combining multiple oil spill model simulations for the unplanned release scenarios under different weather and ocean conditions. This means that in the highly unlikely event an unplanned release does occur, a geographical area much smaller than the EMBA would be affected.



The majority of the impacts and risks directly arising from planned activities would occur within, or within proximity of, the OA.

Chevron Australia has systematic control measures to prevent and mitigate emergencies and to reduce the impact of planned activities on the environment, including ecological, social and cultural sensitivities.

we want to hear from you

We are now seeking feedback and input if you consider your functions, interests, or activities may be affected. This may include Traditional Owners and Custodians with a spiritual and cultural connection to land and sea Country, local community members, and those involved in commercial or recreational fishing and tourism.

Please contact us by **20 January 2026** to be included in consultations. Visit **australia.chevron.com/feedback**, call tollfree on **1800 225 195** or scan the **QR code** for more information.

environment plan

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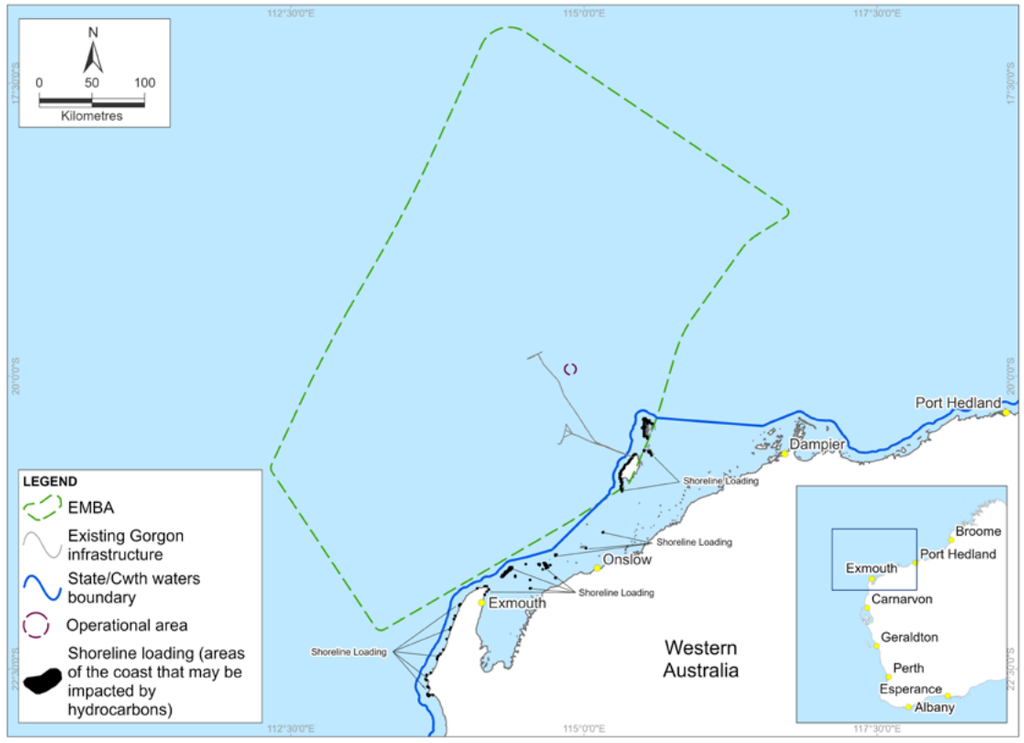

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Appendix G Operational and scientific monitoring assessment

Relevance of OMPs SMPs to the activity

Table G-1 lists the Joint Industry OMPs and SMPs that are relevant to CAPL's G&E drilling petroleum activity. CAPL confirms that it has reviewed the aims and objectives of these relevant OMPs and SMPs and determined that they are appropriate to meet the monitoring requirements of this activity, addressing potential impacts, risks and response activities.

Table G-1: Joint Industry OSM Plans relevant to G&E drilling petroleum activity

Operational monitoring	Relevant for G&E drilling petroleum activity	Scientific monitoring	Relevant for G&E drilling petroleum activity
OM1: Hydrocarbon Characterisation	✓	SM1: Water Quality Impact Assessment	✓
OM2: Hydrocarbon in water assessment	✓	SM2: Sediment Quality Impact Assessment	✓
OM3: Hydrocarbon in sediment assessment	✓	SM3: Intertidal and Coastal Habitat Assessment	✓
OM4a: Surface dispersant effectiveness monitoring	✗	SM4: Seabirds and Shorebirds Assessment	✓
OM4b: Subsea dispersant injection effectiveness monitoring	✓	SM5: Marine Mega-fauna Assessment	✓
OM5: Rapid Marine Fauna Surveillance	✓	SM6: Benthic Habitat Assessment	✓
OM6: Shoreline Clean-up Assessment	✓	SM7: Marine fish and elasmobranch assemblages assessment	✓
OM7: Air Quality Modelling	✓	SM8: Fisheries Impact Assessment	✓
-	-	SM9: Heritage Features Assessment	✓
-	-	SM10: Social Impact Assessment	✓

Activity OSM Assessment

The CAPL OSM Bridging Implementation Plan (OSM-BIP) (Ref. 3) defines the 3-step process for ensuring that OSM priorities and capabilities of each activity are adequately covered by the existing information described within the CAPL OSM-BIP (Section 1.1 and Appendix B of the OSM-BIP).

Step 1: Determine if the activity specific OSM Exposure Area fits within the CAPL OSM-BIP Combined OSM Planning Area

The Combined OSM Planning Area is determined by the predicted spatial extent of hydrocarbon exposure at the low thresholds for surface, shoreline accumulation, entrained, and dissolved components. The Combined OSM Planning Area is described as the 'offshore area' in which CAPL's activities may interact with the environment and is applicable to all EPs.

For each activity, an activity specific OSM Exposure Area is developed to predict the spatial extent of hydrocarbon exposure at the low thresholds for surface, in-water and shoreline components.

Comparison of the activity-specific OSM Exposure Area for the G&E drilling petroleum activity (Figure G-1) with the CAPL OSM-BIP Combined OSM Planning Area shows that it fits within the CAPL OSM-BIP Combined OSM Planning Area (Figure 2-1 in the CAPL OSM-BIP). This step ensures that the activity-specific OSM Exposure Area is included in the current description of the environment.

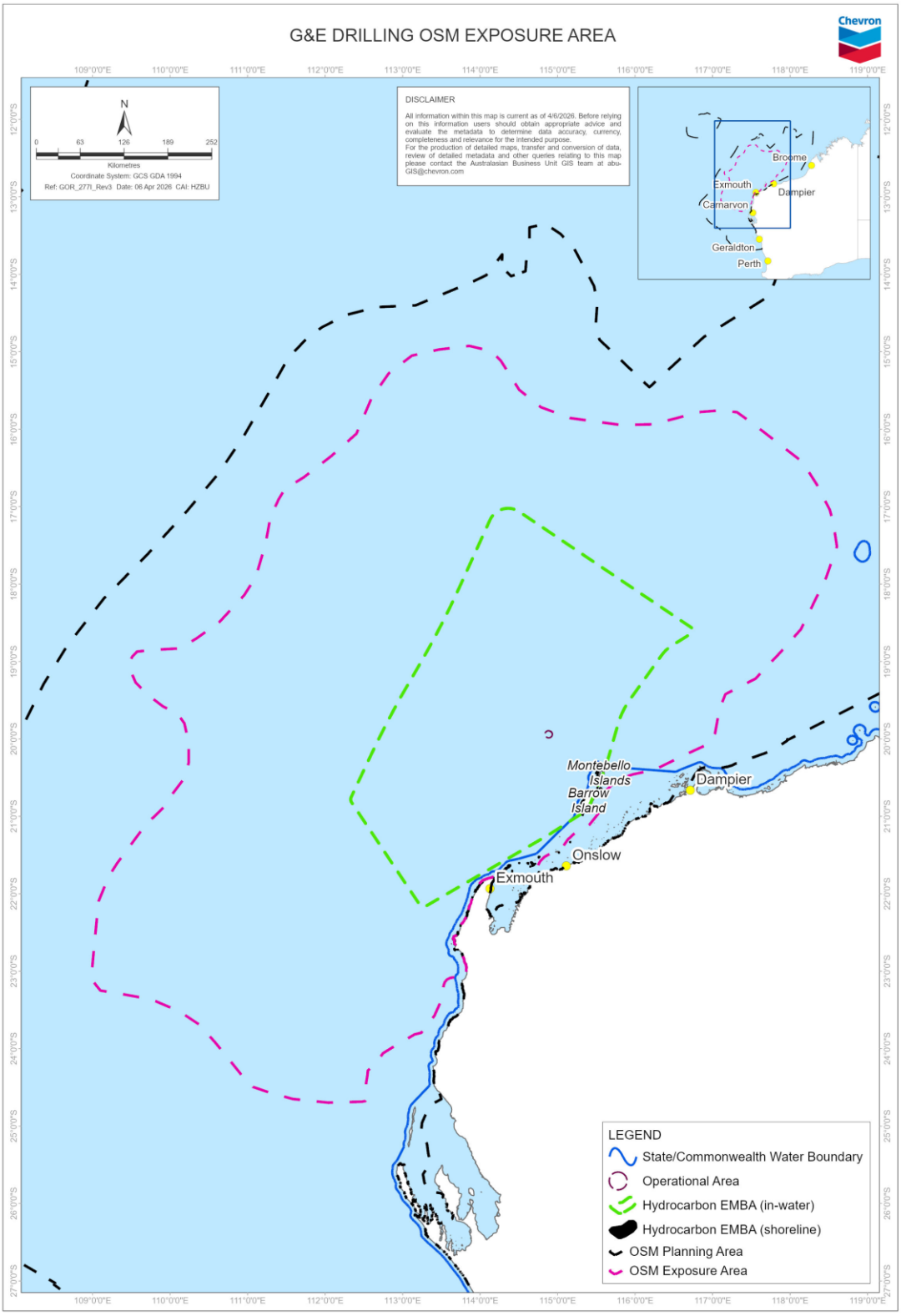


Figure G-1: OSM Exposure Area for G&E drilling petroleum activity

Step 2: Determine activity-specific monitoring priorities and tier rankings for the first 14 days of the spill scenario, in accordance with the tiered prioritisation hierarchy described in Section 2.2 of the CAPL OSM-BIP

The monitoring priorities for the G&E drilling petroleum activity have been identified through application of the tiered prioritisation hierarchy described in Section 2.2 of the CAPL OSM-BIP to the stochastic modelling results (Table G-2) for the two worst-case credible spill scenarios: LOWC subsea release of Geryon condensate; and vessel collision surface release of Marine Diesel Oil (MDO).

Table G-2 presents stochastic modelling results for each receptor at all three exposure values (low, moderate and high) for each phase (floating, shoreline, entrained, dissolved), filtered by 10% probability and ≤14 days contact. A summary of stochastic modelling results is provided in Sections 8.15.3 and 8.16.3 of the EP.

As noted in Section 2.2.3 of the CAPL OSM-BIP, additional monitoring prioritisation criteria are also applied in the assessment of monitoring priorities, including baseline data adequacy. The results of the baseline data assessment for the G&E drilling monitoring priorities are provided in Table G-3, which is an excerpt from Table 4-3 of the CAPL OSM-BIP (but only includes monitoring priorities for the G&E drilling petroleum activity).

CAPL confirms that the receptors identified as monitoring priorities are all included in Table 2-1 of the CAPL OSM-BIP and have therefore been assessed for baseline data adequacy, background information for key sensitivities and are appropriately represented in the CAPL OSM-BIP. Biologically Important Areas (BIAs), habitat critical to the survival of marine turtles (HCTS) and Key Ecological Features (KEFs) are broad-scale areas mapped by the Australian Government (Ref. 5; Ref. 6; Ref. 7) rather than discrete receptor locations, and are not assessed separately; where they overlap a named receptor, the species and habitats they support are captured in that receptor's baseline assessment (Table G-3).

Initial monitoring priorities (within the first 14 days of a spill)

CAPL has reviewed the LOWC scenario (Geryon condensate) stochastic modelling results (Table G-2) and identified the receptors, including BIAs, HCTS and KEFs, predicted to be contacted at ≥10% probability within the 14-day window, and assigned each a Base Tier as summarised below. Tier rankings for the LOWC scenario are presented in Table G-4.

- Base Tier 1: the pygmy blue whale (migration) and wedge-tailed shearwater (breeding) BIAs contacted at the high floating (≥50 g/m²) and entrained (≥1,000 ppb) exposure values;
- Base Tier 2: the humpback whale (migration), whale shark (foraging) and flatback turtle (internesting buffer, Montebello Islands and Thevenard Island) BIAs, the flatback turtle internesting HCTS, and the Continental Slope Demersal Fish Communities, Exmouth Plateau and Ancient coastline at 125 m depth contour KEFs, contacted at the moderate entrained exposure value (≥100 ppb);
- Base Tier 3: the Gascoyne AMP, Montebello AMP, Muiron Islands MMA, Ningaloo WHA and AMP, Rankin Bank, Tryal Rocks, the WA11.West (326: Serrurier, Bessieres, Round Islands) and WA11.West (329: Muiron Islands) shoreline cells, the green, hawksbill and loggerhead turtle (internesting buffer), flatback turtle (nesting, Thevenard Island), pygmy

blue whale (foraging), fairy tern, roseate tern and lesser crested tern (breeding) BIAs, the green, hawksbill, and green and loggerhead turtle internesting HCTS, and the Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula and Commonwealth waters adjacent to Ningaloo Reef KEFs, contacted at the low exposure values.

Following application of the additional monitoring prioritisation criteria, the WA11.West (326: Serrurier, Bessieres, Round Islands) and WA11.West (329: Muiron Islands) shoreline cells were promoted to Tier 2 (Table G-4).

For the MDO scenario (vessel collision), CAPL has identified the receptors, including BIAs, HCTS and KEFs, predicted to be contacted at ≥10% probability within the 14-day window, and assigned each a Base Tier as summarised below. Tier rankings for the vessel collision scenario are presented in Table G-5.

- Base Tier 1: the pygmy blue whale (migration) and wedge-tailed shearwater (breeding) BIAs contacted at the high floating (≥50 g/m²) and entrained (≥1,000 ppb) exposure values;
- Base Tier 2: the Gascoyne AMP and the humpback whale (migration), whale shark (foraging) and flatback turtle (internesting buffer, Montebello Islands and Thevenard Island) BIAs, the flatback turtle internesting HCTS, and the Continental Slope Demersal Fish Communities, Exmouth Plateau and Ancient coastline at 125 m depth contour KEFs, contacted at the moderate entrained exposure value (≥100 ppb);
- Base Tier 3: the Ningaloo WHA and AMP, the hawksbill and loggerhead turtle (internesting buffer, Ningaloo and Jurabi coasts), pygmy blue whale (foraging) and roseate tern (breeding) BIAs, the green and loggerhead turtle internesting HCTS (Exmouth Gulf and Ningaloo coast), and the Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula and Commonwealth waters adjacent to Ningaloo Reef KEFs, contacted only at the low entrained exposure value.

Figure G-2 and Figure G-3 present the tier envelope maps for the G&E LOWC and MDO vessel collision scenarios respectively, showing the spatial extent of the receptor tier assignments in Table G-4 and Table G-5. Each map shows the Tier 1, Tier 2 and Tier 3 envelopes as separate contours, with each envelope representing the union of the four hydrocarbon phases (entrained, dissolved, floating, shoreline) combined across all three modelled seasons (summer, transitional, winter) at the 14-day truncated stochastic outputs. The envelopes are derived from the stochastic outputs across the full modelled probability of contact distribution (i.e. not restricted ≥10% probability). The envelopes are derived and interpreted using the tiered prioritisation hierarchy in Section 2.2 of the CAPL OSM-BIP.

The inclusion of entrained hydrocarbons at concentrations above the 10 ppb exposure value denotes exposure but does not necessarily imply toxicity; for entrained whole-oil droplets, the toxic fraction is small as many hydrocarbon constituents remain sequestered and not bioavailable (Ref. 8). Where a receptor is contacted only by the lowest concentration of entrained hydrocarbons and not by any other hydrocarbon phase, it has been assigned to Tier 3, with the rationale recorded in the 'Additional monitoring prioritisation criteria' column of Table G-4 and Table G-5.

Tier 1 or Tier 2 monitoring would be initiated if situational awareness data and/or surveillance during an actual spill identifies exposure at a receptor, as

per the dynamic re-evaluation process in Sections 13 and 18 of the CAPL OSM-BIP. Therefore, CAPL and its OSM Services Provider(s) will still activate and mobilise monitoring resources to Tier 3 receptors in the absence of any higher ranked receptors.

Receptors contacted beyond the 14-day initial prioritisation window

Stochastic modelling for the G&E drilling activity predicts that some receptors are contacted beyond the 14-day initial prioritisation window. These receptors are ranked and prioritised using the same three-tier framework as per Section 2.2 of the CAPL OSM-BIP, based on the exposure value reached and the additional criteria in Section 2.2.3. Beyond-14-day receptors are addressed post-spill through the continual re-evaluation of monitoring priorities described in Sections 13 and 18 of the CAPL OSM-BIP, informed by monitor and evaluate data and post-spill modelling assessment.

Consideration of KEFs, BIAs, HCTS and other broad-scale receptors

Broad-scale ecological features within the OSM Exposure Area for this activity have been considered in tier ranking and OSM capability planning. KEFs, BIAs, HCTS and Australian Marine Parks (AMPs) intersecting the OSM Exposure Area are described in Appendix G and Appendix I of the CAPL OSM-BIP. Consistent with Section 2.2.3 of the CAPL OSM-BIP, the CAPL PPP (Ref. 2) considers these features in two ways. AMPs and KEFs are ranked as conservation estates in their own right and are therefore assessed as receptors in Table G-4 and Table G-5 wherever they are predicted to be contacted.

Five KEFs are predicted to be contacted at ≥10% probability within the 14-day window (Table G-2), all by entrained hydrocarbons; the Continental Slope Demersal Fish Communities KEF is also contacted by floating oil, at the low exposure value and under the LOWC scenario only. Their tier rankings are presented in Table G-4 and Table G-5.

Four of these KEFs are defined by seafloor features at depth, being the Continental Slope Demersal Fish Communities, the Exmouth Plateau, the canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula, and the Ancient coastline at 125 m depth contour (Ref. 7). Modelled ‘contact’ with these KEFs indicates hydrocarbons at the sea surface or in the water column above the feature, and direct exposure of their seabed habitats is unlikely except in the vicinity of a subsea release. However, the values of these KEFs apply to both their benthic and pelagic habitats, as the features are associated with upwelling and enhanced productivity that support aggregations of pelagic species such as whale sharks, humpback whales, large predatory fish and seabirds (Ref. 7). Monitoring of these KEFs therefore focuses on water quality (OM2 and SM1), marine fish (SM7) and any associated fauna (SM4 and SM5, initiated as indicated by OM5). Close to the release location, where exposure of its seabed habitats is possible, the Continental Slope Demersal Fish Communities KEF is monitored by the spill site monitoring team, which implements OM2 and OM3, and SM1, SM2, SM6 and SM7 where indicated by their initiation criteria (Table 7-1 and Table 7-2 of the CAPL OSM-BIP).

BIAs are incorporated into the CAPL PPP fauna rankings (Ref. 2). Each BIA contacted at the Tier 1, Tier 2 or Tier 3 base exposure values is assessed as a receptor in its own right, at the tier its exposure warrants, and is assigned the CAPL PPP fauna ranking (Ref. 2) for the species’ listing status under the

Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) and its life cycle or behaviour grouping.

HCTS (Ref. 4; Ref. 5) is not ranked in the CAPL PPP (Ref. 2) and is treated in the same way as BIAs. As HCTS comprises only nesting and internesting habitat (Ref. 4), it is assigned the CAPL PPP fauna ranking for the species in the breeding grouping (Ref. 2), with the higher ranking applied where an area is defined for more than one species (Ref. 2). The flatback turtle HCTS is Tier 2 under both scenarios, and the green, hawksbill and loggerhead turtle HCTS are Tier 3 (Table G-4 and Table G-5).

BIAs and HCTS contacted only at the low entrained exposure value within the 14-day window (Table G-2), being the other marine turtle, seabird and pygmy blue whale (foraging) BIAs and the green, hawksbill and loggerhead turtle HCTS, are listed as Tier 3 in Table G-4 and Table G-5. To keep the tables concise, BIAs of the same species and type are grouped in a single row, as are the roseate and lesser crested tern breeding BIAs and the green and hawksbill turtle HCTS, each pair sharing the same CAPL PPP fauna ranking. For grouped rows, the probability of contact and time to contact for each BIA and HCTS area are given in Table G-2, and the row shows where the peak concentration was predicted. Where several species share an HCTS area, the higher CAPL PPP fauna ranking is applied, consistent with the CAPL PPP approach for receptors with multiple ranks (Ref. 2).

Several of the BIAs and HCTS listed in Table G-4 and Table G-5 are of significance only during particular periods of the year, being the periods in which the species is present or undertakes the behaviour for which the BIA is defined:

- pygmy blue whale (migration): passive acoustic monitoring near the Jansz location (2019 to 2023) detected pygmy blue whales migrating north from late March to mid-September (peak late May to June) and south from early October to late January (peak late November to early December) (Section 5.3.3.1.1 of the EP);
- humpback whale (migration): the northern migration through the BIA occurs from late July to September (Ref. 6); by October the majority of whales have started the southward migration, and sightings are rare after November (Ref. 2);
- wedge-tailed shearwater (breeding): a breeding visitor to the Pilbara, arriving in mid-August and leaving in April (Ref. 6);
- flatback turtle (internesting buffer and nesting BIAs and HCTS): Pilbara nesting runs from late November to March, peaking in January (Ref. 2), and the flatback HCTS is defined for October to March (Ref. 5);
- green turtle (internesting buffer BIAs and HCTS): the green turtle HCTS is defined for November to March, and the internesting buffer BIAs are attributed to summer or early summer (Table 5-9 and Table 5-10, Section 5.3.3.2 of the EP);
- hawksbill turtle (internesting buffer BIAs and HCTS): the hawksbill turtle HCTS is defined for October to February, and the internesting buffer BIAs are mostly attributed to spring and early summer, with peak nesting in October (Table 5-9 and Table 5-10, Section 5.3.3.2 of the EP);
- loggerhead turtle (internesting buffer BIAs and HCTS): the loggerhead turtle HCTS at Exmouth Gulf and the Ningaloo coast is defined for

November to May, and overlaps the green turtle HCTS in the same area, defined for November to March; no seasonal timing is identified for the loggerhead turtle internesting buffer BIAs (Table 5-9 and Table 5-10, Section 5.3.3.2 of the EP);

- pygmy blue whale (foraging): the Ningaloo BIA is a possible foraging area, and use of foraging areas off north-west Western Australia is correlated with the northern and southern migrations (Section 5.3.3.1.1 and Table 5-17 of the EP);
- fairy tern, roseate tern and lesser crested tern (breeding): fairy terns breed from July to late September, roseate terns from mid-March to July, and lesser crested terns from March to June (Table 5-15, Section 5.3.3.4 of the EP);
- whale shark (foraging): the BIA is attributed to spring (Ref. 6), although whale sharks are known to occur at Ningaloo throughout the year (Ref. 2).

The tier rankings in Table G-4 and Table G-5 combine the three modelled seasons (summer, September to March; transitional, April and August; winter, May to July) and therefore assume that the BIA and HCTS values are present year-round. For the pygmy blue whale, wedge-tailed shearwater, humpback whale, whale shark and flatback turtle (Montebello Islands) BIAs, and the flatback turtle HCTS, the exposure that sets the tier is predicted in every modelled season, including the season that overlaps the period of significance; for example, the flatback turtle internesting buffer at the Montebello Islands is contacted at the moderate entrained exposure value in the summer season under both scenarios (LOWC 40%, 7.74 days; MDO 14%, 1.69 days) (Ref. 9). The exception is the flatback turtle internesting buffer at Thevenard Island, which is contacted at the moderate entrained exposure value only in the winter season (LOWC 20%, 6.94 days; MDO 10%, 2.95 days), outside the flatback nesting season, and only at the low entrained exposure value in the summer season (Ref. 9). Its Tier 2 ranking is retained as a precautionary planning ranking. At the time of a spill, the seasonal presence of the species and behaviour for which each BIA is defined will be considered when tier rankings are confirmed and re-evaluated (Section 13 of the CAPL OSM-BIP), so that SM4 and SM5 effort is directed to the BIAs whose values are present. The BIAs and HCTS listed at Tier 3 are retained at Tier 3, the lowest tier, as a precautionary planning ranking, including where the low exposure that sets the tier is predicted only outside their period of significance (for example, the flatback turtle nesting BIA at Thevenard Island, which is contacted only in the winter season under the LOWC scenario). Their seasonal presence is likewise considered when tier rankings are confirmed at the time of a spill.

The KEFs, BIAs and HCTS listed in Table G-4 and Table G-5 are captured by the monitoring units in which they lie (Table 8-2 of the CAPL OSM-BIP). The monitoring units are shown relative to the stochastic Tier 3 exposure area (≤14 days), together with the KEFs, BIAs and HCTS, for the LOWC scenario in Figure G-4 (KEFs), Figure G-5 (dugong, shark, whale and seabird BIAs) and Figure G-6 (marine turtle BIAs and HCTS), and for the MDO scenario in Figure G-7 (KEFs), Figure G-8 (dugong, shark, whale and seabird BIAs) and Figure G-9 (marine turtle BIAs and HCTS). In these figures the monitoring units are numbered as Areas; Area 8 (Ningaloo Onshore) corresponds to the Ningaloo Nearshore unit in Table 8-2 of the CAPL OSM-BIP. Within each monitoring unit contacted, teams are allocated according to the features and species

present in that unit. Where a BIA or HCTS area within a unit extends beyond the named receptors, OM5 (Rapid Marine Fauna Surveillance) is deployed across the unit to survey these areas away from the named receptors, and a dedicated vessel-based fauna team (SM4 and SM5) is provisioned to monitor fauna in those areas under the direction of OM5. The initiation of SM4 and SM5 is guided by the results of OM5. The Tier 1 assignment for the pygmy blue whale (migration) and wedge-tailed shearwater (breeding) BIAs reflects the release location lying within these BIAs. The area of these BIAs near the release location is surveyed by OM5 as part of the spill site aerial surveillance (Table 8-7 of the CAPL OSM-BIP), which directs SM4 and SM5 to where the animals are found.

Table G-2: Stochastic modelling results for G&E drilling petroleum activity: Receptors with a probability of contact ≥10% and ≤14 days

Receptor	Floating						Shoreline						Entrained						Dissolved					
	Low prob (%)	Mod prob (%)	High prob (%)	Low time (d)	Mod time (d)	High time (d)	Low prob (%)	Mod prob (%)	High prob (%)	Low time (d)	Mod time (d)	High time (d)	Low prob (%)	Mod prob (%)	High prob (%)	Low time (d)	Mod time (d)	High time (d)	Low prob (%)	Mod prob (%)	High prob (%)	Low time (d)	Mod time (d)	High time (d)
Surface release of 2,350 m³ of MDO (vessel collision) in the G&E Field																								
Gascoyne AMP*	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	53 (T)	11 (W)	NC	5.05 (T)	5.43 (W)	NC	NC	NC	NC	NC	NC	NC
Ningaloo WHA & MP	NC	NC	NC	NC	NC	NC	1 (S)	NC	NC	32.4 (S)	NC	NC	11 (W)	NC	NC	8.17 (W)	NC	NC	NC	NC	NC	NC	NC	NC
BIAs																								
Flatback Turtle - Internesting buffer (Montebello Is - Hermite Is, NW Is, Trimouille Is)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	29 (T)	14 (S)	1 (T)	1 (T)	1.69 (S)	3.14 (T)	NC	NC	NC	NC	NC	NC
Flatback Turtle - Internesting buffer (Thevernard Island - South coast)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	26 (W)	10 (W)	NC	2.61 (W)	2.95 (W)	NC	NC	NC	NC	NC	NC	NC
Hawksbill Turtle - Internesting buffer (Ningaloo coast and Jurabi coast)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	13 (W)	2 (W)	NC	7.78 (W)	8.93 (W)	NC	NC	NC	NC	NC	NC	NC
Humpback Whale - Migration (north and south)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	53 (W)	32 (W)	NC	1.94 (W)	2.02 (W)	NC	NC	NC	NC	NC	NC	NC
Loggerhead Turtle - Internesting buffer (Ningaloo	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	13 (W)	2 (W)	NC	7.78 (W)	8.93 (W)	NC	NC	NC	NC	NC	NC	NC

Receptor	Floating						Shoreline						Entrained						Dissolved					
coast and Jurabi coast)																								
Pygmy Blue Whale - Foraging (Ningaloo)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	22 (T)	2 (W)	NC	7.27 (T)	9.07 (W)	NC	NC	NC	NC	NC	NC	NC
Pygmy Blue Whale - Migration (Augusta to Derby)**	100 (S)	100 (S)	84 (S)	0.01 (S)	0.01 (S)	0.02 (S)	NA	NA	NA	NA	NA	NA	100 (S)	100 (S)	100 (W)	0.01 (S)	0.01 (S)	0.01 (W)	92 (W)	59 (W)	NC	0.03 (W)	0.17 (W)	NC
Roseate Tern - Breeding (Kimberley, Pilbara and Gascoyne coasts and islands including Ashmore Reef)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	15 (W)	NC	NC	9.42 (W)	NC	NC	NC	NC	NC	NC	NC	NC
Wedge-tailed Shearwater - Breeding (Kimberley, Pilbara and Gascoyne coasts and islands including Ashmore Reef)**	100 (S)	100 (S)	84 (S)	0.01 (S)	0.01 (S)	0.02 (S)	NA	NA	NA	NA	NA	NA	100 (S)	100 (W)	97 (S)	0.01 (S)	0.01 (W)	0.01 (S)	91 (W)	59 (W)	NC	0.03 (W)	0.17 (W)	NC
Whale Shark - Foraging (Northward from Ningaloo along 200 m isobath)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	29 (T)	14 (S)	1 (T)	1.02 (T)	1.74 (S)	3.27 (T)	NC	NC	NC	NC	NC	NC
HCTS																								
Flatback Turtle - Barrow Island, Montebello Islands, coastal islands from	1 (S)	NC	NC	1.65 (S)	NC	NC	NA	NA	NA	NA	NA	NA	48 (W)	28 (W)	1 (S)	1.86 (W)	2.17 (W)	2.28 (S)	NC	NC	NC	NC	NC	NC

Receptor	Floating						Shoreline						Entrained						Dissolved					
Cape Preston to Locker Island. 60km internesting buffer																								
Green and Loggerhead Turtle - Exmouth Gulf and Ningaloo coast. 20km internesting buffer	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	11 (W)	2 (W)	NC	8.03 (W)	9.92 (W)	NC	NC	NC	NC	NC	NC	NC
KEFs																								
Ancient coastline at 125 m depth contour*	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	20 (S)	10 (S)	NC	1.89 (S)	2.07 (S)	NC	NC	NC	NC	NC	NC	NC
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula*	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	38 (T)	9 (W)	NC	6.35 (T)	7.32 (W)	NC	NC	NC	NC	NC	NC	NC
Commonwealth waters adjacent to Ningaloo Reef*	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	10 (W)	NC	NC	8.17 (W)	NC	NC	NC	NC	NC	NC	NC	NC
Continental Slope Demersal Fish Communities*	6 (W)	1 (T)	NC	1.18 (W)	1.09 (T)	NC	NA	NA	NA	NA	NA	NA	77 (T)	62 (W)	6 (W)	0.50 (T)	0.91 (W)	1.41 (W)	8 (W)	NC	NC	1.23 (W)	NC	NC
Exmouth Plateau*	1 (W)	NC	NC	4.84 (W)	NC	NC	NA	NA	NA	NA	NA	NA	67 (W)	29 (W)	NC	1.63 (W)	1.85 (W)	NC	NC	NC	NC	NC	NC	NC
Subsea release of 48,862 m³ of Condensate (LOWC) in the G&E Field																								
Gascoyne AMP*	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	100 (T)	NC	NC	6.45 (T)	NC	NC	NC	NC	NC	NC	NC	NC
Montebello AMP*	6 (T)	NC	NC	17.35 (T)	NC	NC	NA	NA	NA	NA	NA	NA	43 (W)	NC	NC	8.59 (W)	NC	NC	NC	NC	NC	NC	NC	NC

Receptor	Floating						Shoreline						Entrained						Dissolved					
Muiron Islands MMA*	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	47 (W)	NC	NC	14.0 (W)	NC	NC	NC	NC	NC	NC	NC	NC
WA11.West (326) - Baresand Point - Entrance Point E (Serrurier Island, Bessieres Island, Round Island)	NC	NC	NC	NC	NC	NC	19 (W)	NC	NC	12.77 (W)	NC	NC	31 (W)	NC	NC	12.55 (W)	NC	NC	NC	NC	NC	NC	NC	NC
WA11.West (329) - Locker Point - Baresand Point (Muiron Islands)	NC	NC	NC	NC	NC	NC	35 (W)	NC	NC	13.67 (W)	NC	NC	48 (W)	NC	NC	11.69 (W)	NC	NC	NC	NC	NC	NC	NC	NC
Ningaloo WHA	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	60 (W)	NC	NC	13.24 (W)	NC	NC	NC	NC	NC	NC	NC	NC
Rankin Bank*	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	26 (S)	NC	NC	5.95 (S)	NC	NC	NC	NC	NC	NC	NC	NC
Tryal Rocks*	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	10 (S)	NC	NC	13.02 (S)	NC	NC	NC	NC	NC	NC	NC	NC
BIAs																								
Fairy Tern - Breeding (Pilbara and Gascoyne coasts and islands)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	21 (S)	8 (S)	8 (S)	13.14 (S)	28.35 (S)	35.67 (S)	NC	NC	NC	NC	NC	NC
Flatback Turtle - Internesting buffer (Montebello Is - Hermite Is, NW Is, Trimouille Is)	23 (S)	NC	NC	3.78 (S)	NC	NC	NA	NA	NA	NA	NA	NA	100 (T)	49 (W)	8 (S)	0.57 (T)	5.32 (W)	35.67 (S)	NC	NC	NC	NC	NC	NC
Flatback Turtle - Internesting buffer (Thevenard	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	93 (W)	20 (W)	NC	3.94 (W)	6.94 (W)	NC	NC	NC	NC	NC	NC	NC

Receptor	Floating						Shoreline						Entrained						Dissolved					
Island - South coast)																								
Flatback Turtle - Nesting (Thevernard Island - South coast)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	27 (W)	NC	NC	12.55 (W)	NC	NC	NC	NC	NC	NC	NC	NC
Green Turtle - Internesting buffer (Middle Is. West Coast Barrow Island West Coast and North Coast)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	30 (W)	8 (S)	NC	13.89 (W)	28.35 (S)	NC	NC	NC	NC	NC	NC	NC
Green Turtle - Internesting buffer (Montebello Is - Hermite Is, NW Is, Trimouille Is)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	15 (S)	8 (S)	8 (S)	11.98 (S)	29.51 (S)	35.67 (S)	NC	NC	NC	NC	NC	NC
Green Turtle - Internesting buffer (Montebello Islands)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	15 (S)	8 (S)	8 (S)	9.01 (S)	29.51 (S)	35.67 (S)	NC	NC	NC	NC	NC	NC
Green Turtle - Internesting buffer (North and South Muiron Is)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	51 (W)	NC	NC	9.57 (W)	NC	NC	NC	NC	NC	NC	NC	NC
Green Turtle - Internesting buffer (North West Cape)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	50 (W)	NC	NC	10.68 (W)	NC	NC	NC	NC	NC	NC	NC	NC
Hawksbill Turtle - Internesting buffer (Barrow Island)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	31 (W)	8 (S)	NC	13.92 (W)	28.35 (S)	NC	NC	NC	NC	NC	NC	NC
Hawksbill Turtle - Internesting	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	14 (S)	8 (S)	8 (S)	12.07 (S)	29.51 (S)	35.67 (S)	NC	NC	NC	NC	NC	NC

Receptor	Floating						Shoreline						Entrained						Dissolved					
buffer (Lowendal Island Group)																								
Hawksbill Turtle - Internesting buffer (Montebello Is - Hermite Is, NW Is, Trimouille Is)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	15 (S)	8 (S)	8 (S)	11.98 (S)	29.51 (S)	35.67 (S)	NC	NC	NC	NC	NC	NC
Hawksbill Turtle - Internesting buffer (Montebello Is, Trimoulle and NW islands)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	14 (S)	8 (S)	8 (S)	12.1 (S)	29.51 (S)	35.67 (S)	NC	NC	NC	NC	NC	NC
Hawksbill Turtle - Internesting buffer (Ningaloo coast and Jurabi coast)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	57 (W)	NC	NC	10.73 (W)	NC	NC	NC	NC	NC	NC	NC	NC
Humpback Whale - Migration (north and south)	5 (T)	NC	NC	65.44 (T)	NC	NC	NA	NA	NA	NA	NA	NA	100 (S)	29 (W)	8 (S)	2.8 (S)	5.41 (W)	35.67 (S)	NC	NC	NC	NC	NC	NC
Lesser Crested Tern - Breeding (Kimberley, Pilbara and Gascoyne coasts and islands including Ashmore Reef)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	21 (S)	8 (S)	8 (S)	11 (S)	29.51 (S)	35.67 (S)	NC	NC	NC	NC	NC	NC
Loggerhead Turtle - Internesting buffer	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	14 (S)	8 (S)	8 (S)	11.98 (S)	29.51 (S)	35.67 (S)	NC	NC	NC	NC	NC	NC

Receptor	Floating						Shoreline						Entrained						Dissolved					
(Montebello Islands)																								
Loggerhead Turtle - Internesting buffer (Muiron Island)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	48 (W)	NC	NC	9.63 (W)	NC	NC	NC	NC	NC	NC	NC	NC
Loggerhead Turtle - Internesting buffer (Ningaloo coast and Jurabi coast)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	57 (W)	NC	NC	10.73 (W)	NC	NC	NC	NC	NC	NC	NC	NC
Pygmy Blue Whale - Foraging (Ningaloo)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	67 (T)	NC	NC	9.33 (T)	NC	NC	NC	NC	NC	NC	NC	NC
Pygmy Blue Whale - Migration (Augusta to Derby)**	100 (S)	100 (S)	23 (W)	0.08 (S)	0.15 (S)	1.2 (W)	NA	NA	NA	NA	NA	NA	100 (S)	100 (S)	100 (T)	0.01 (S)	0.06 (S)	0.29 (T)	NC	NC	NC	NC	NC	NC
Roseate Tern - Breeding (Kimberley, Pilbara and Gascoyne coasts and islands including Ashmore Reef)	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	48 (S)	8 (S)	8 (S)	13.03 (S)	29.51 (S)	35.67 (S)	NC	NC	NC	NC	NC	NC
Wedge-tailed Shearwater - Breeding (Kimberley, Pilbara and Gascoyne coasts and islands including Ashmore Reef)**	100 (S)	100 (S)	23 (W)	0.08 (S)	0.15 (S)	1.2 (W)	NA	NA	NA	NA	NA	NA	100 (S)	100 (S)	100 (T)	0.01 (S)	0.06 (S)	0.29 (T)	NC	NC	NC	NC	NC	NC
Whale Shark - Foraging	19 (S)	NC	NC	3.95 (S)	NC	NC	NA	NA	NA	NA	NA	NA	100 (T)	45 (W)	NC	0.6 (T)	6.06 (W)	NC	NC	NC	NC	NC	NC	NC

Receptor	Floating						Shoreline						Entrained						Dissolved					
(Northward from Ningaloo along 200 m isobath)																								
HCTS																								
Flatback Turtle - Barrow Island, Montebello Islands, coastal islands from Cape Preston to Locker Island. 60km internesting buffer	30 (S)	NC	NC	2.01 (S)	NC	NC	NA	NA	NA	NA	NA	NA	100 (T)	53 (W)	8 (S)	0.6 (T)	4.72 (W)	35.67 (S)	NC	NC	NC	NC	NC	NC
Green Turtle - Barrow Island, Montebello Islands, Serrier Island and Thevenard Island. 20km internesting buffer	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	48 (W)	8 (S)	8 (S)	9.66 (W)	28.35 (S)	35.67 (S)	NC	NC	NC	NC	NC	NC
Hawksbill Turtle - Cape Preston to mouth of Exmouth Gulf including Montebello Islands and Lowendal Islands. 20km internesting buffer	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	48 (W)	8 (S)	8 (S)	9.66 (W)	28.35 (S)	35.67 (S)	NC	NC	NC	NC	NC	NC
Green and Loggerhead Turtle - Exmouth Gulf and Ningaloo coast. 20km internesting buffer	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	59 (W)	NC	NC	11.07 (W)	NC	NC	NC	NC	NC	NC	NC	NC

Receptor	Floating						Shoreline						Entrained						Dissolved					
KEFs																								
Ancient coastline at 125 m depth contour*	8 (S)	NC	NC	11.60 (S)	NC	NC	NA	NA	NA	NA	NA	NA	98 (T)	19 (W)	NC	2.18 (T)	13.75 (W)	NC	NC	NC	NC	NC	NC	NC
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula*	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	85 (W)	NC	NC	6.66 (W)	NC	NC	NC	NC	NC	NC	NC	NC
Commonwealth waters adjacent to Ningaloo Reef*	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NA	29 (W)	NC	NC	13.24 (W)	NC	NC	NC	NC	NC	NC	NC	NC
Continental Slope Demersal Fish Communities*	79 (S)	1 (S)	NC	0.95 (S)	7.35 (S)	NC	NA	NA	NA	NA	NA	NA	100 (T)	100 (W)	NC	0.38 (T)	0.95 (W)	NC	NC	NC	NC	NC	NC	NC
Exmouth Plateau*	3 (S)	NC	NC	20.40 (S)	NC	NC	NA	NA	NA	NA	NA	NA	100 (W)	22 (W)	NC	1.86 (W)	13.26 (W)	NC	NC	NC	NC	NC	NC	NC

** Submerged receptor with no features above the sea surface. Modelling indicates 'contact' with these receptors when the hydrocarbons pass over the receptor on the sea surface.*

*** The release location lies within the receptor boundary.*

NA = Not applicable (e.g. shoreline exposure not applicable to a submerged receptor, or shoreline accumulation not assessed in the modelling for BIAs, KEFs and HCTS). NC = No contact predicted at that exposure value.

Values are probability of contact (%) and minimum arrival time (days).

Season codes: S = Summer (Sep–Mar); T = Transitional (Apr/Aug); W = Winter (May–Jul). Season codes identify the season with the highest probability of contact at that exposure value, and the minimum time to contact shown is for that same season. Where more than one season has the same highest probability, the season with the shortest time to contact is shown. For BIAs, KEFs and HCTS, where the season with the highest probability did not meet the ≤14 day criterion, the season that meets the ≥10% probability and ≤14 day criteria is shown.

Exposure values: Floating oil Low/Moderate/High = ≥1 / ≥10 / ≥50 g/m². Shoreline Low/Moderate/High = ≥10 / ≥100 / ≥1,000 g/m². Entrained Low/Moderate/High = ≥10 / ≥100 / ≥1,000 ppb. Dissolved Low/Moderate/High = ≥10 / ≥50 / ≥400 ppb.

Table G-3: Baseline data assessment for G&E drilling petroleum activity: Monitoring priorities versus SMPs

Receptor	SM1: Water quality impact	SM2: Sediment quality impact	SM3: Intertidal and coastal habitat	SM4: Seabirds and shorebirds	SM5: Marine mega-fauna assessment – reptiles	SM5: Marine mega-fauna assessment – whale sharks, dugong and cetaceans	SM6: Benthic habitat	SM7: Marine fish and elasmobranch assemblages	SM8: Fisheries impact+	SM9 & 10: Heritage and social impact^
Gascoyne AMP*			NA			Whale sharks & pygmy blue whales				
						Other species				
Montebello AMP*			NA		Green & hawksbill turtle	Whale sharks & pygmy blue whales				
					Sea snakes	Other species				
Ningaloo Coast (including Ningaloo WHA)					Turtle	Whale shark				
					Sea snakes					
Muiron Islands & Muiron Islands MMA					Turtle					
					Sea snakes					
Southern Pilbara Islands & Shoreline (includes Serrurier	Ashburton Port	Ashburton Port		Seabirds at Urala Station, Onslow, Airlie, Serrurier &	Turtles: Onslow, Thevenard & Airlie Islands			Green sawfish		

Receptor	SM1: Water quality impact	SM2: Sediment quality impact	SM3: Intertidal and coastal habitat	SM4: Seabirds and shorebirds	SM5: Marine mega-fauna assessment – reptiles	SM5: Marine mega-fauna assessment – whale sharks, dugong and cetaceans	SM6: Benthic habitat	SM7: Marine fish and elasmobranch assemblages	SM8: Fisheries impact+	SM9 & 10: Heritage and social impact^
Island, Bessieres Island, Round Island)				Thevenard Isl. Shorebirds at Gnoorea, Onslow & Mardie						
					Turtles elsewhere					
					Sea snakes					
Rankin Bank			NA	NA						
Reefs, Shoals and Banks*			N/A							

Key	
	Comprehensive baseline data or ongoing monitoring collected within the last 5 years. Data align with Joint Industry SMP parameters and methods, cover required species/communities and span the necessary spatial extent.
	Historical data (>5 years old) that remain of value, or some current but not extensive baseline data[1]. Caveat: Additional relevant data may exist but be unknown and therefore not included in the assessment.
	No baseline data available, or existing data are inadequate in quality, scope, or relevance. Caveat: Additional relevant data may exist but be unknown and therefore not included in the assessment.
N/A	Not applicable
*	Submerged receptor

[1] Baseline data are considered not extensive where they are limited in spatial and/or temporal coverage, sample size, or representativeness of species and / or the marine environment (e.g. life stages, habitats, seasonality). Such data may not capture natural variability or interannual trends, may be seasonally, taxonomically, or methodologically biased, or may rely on opportunistic or inconsistent datasets with variable data quality.

Receptor	SM1: Water quality impact	SM2: Sediment quality impact	SM3: Intertidal and coastal habitat	SM4: Seabirds and shorebirds	SM5: Marine mega-fauna assessment – reptiles	SM5: Marine mega-fauna assessment – whale sharks, dugong and cetaceans	SM6: Benthic habitat	SM7: Marine fish and elasmobranch assemblages	SM8: Fisheries impact+	SM9 & 10: Heritage and social impact^
+	Locations to be determined in consultation with key stakeholders to reflect current fishing zones/effort									
^	Locations to be determined in consultation with key stakeholders									

Table G-4: LOWC (Geryon condensate - 48,862 m^3) - Monitoring priority tier assessment (stochastic modelling results, ≥10% probability, ≤14 days; source: Ref. 9

Receptor	Receptor type	CAPL PPP ranking (Floating / Dissolved)	Base tier - floating contact (%, time)	Base tier - shoreline contact (%, time)	Base tier - entrained contact (%, time)	Base tier - dissolved contact (%, time)	Resultant base tier	Additional monitoring prioritisation criteria	Initial monitoring prioritisation tier
Gascoyne AMP*	Australian Marine Park (Commonwealth) IUCN II, IV, VI	3 / 3	NC	NA	Low ≥10 ppb (100% (T), 6.45 days (T))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 61 ppb Summer)	Tier 3
Montebello AMP*	Australian Marine Park (Commonwealth) IUCN VI	2 / 2	NC	NA	Low ≥10 ppb (43% (W), 8.59 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 81.9 ppb Transitional)	Tier 3
Muiron Islands MMA*	Marine Management Area (State)	5 / 5	NC	NA	Low ≥10 ppb (47% (W), 14.0 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 70.4 ppb, Summer)	Tier 3
WA11.West (326) – Baresand Point - Entrance Point E (Serrurier, Bessieres, Round Islands)	WAMOPRA shoreline cell (State)	5 / 4	NC	Low ≥10 g/m² (19% (W), 12.77 days (W))	Low ≥10 ppb (31% (W), 12.55 days (W))	NC	Base Tier 3	Contact via shoreline (low) and entrained pathways. Maximum volume of oil ashore = 1 m^3. Promoted based on turtle BIAs	Tier 2
WA11.West (329) - Locker Point - Baresand Point (Muiron Islands)	WAMOPRA shoreline cell (State)	5 / 5	NC	Low ≥10 g/m² (35% (W), 13.67 days (W))	Low ≥10 ppb (48% (W), 11.69 days (W))	NC	Base Tier 3	Contact via shoreline (low) and entrained pathways. Maximum volume of oil ashore = 1.6 m^3; Entrained peak concentration 70.4 ppb, Summer Promoted based on WHA, turtle BIAs and seabird BIA	Tier 2
Ningaloo WHA & MP	World Heritage Area & State Marine Park	5 / 5	NC	NA	Low ≥10 ppb (60% (W), 13.24 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 70.4 ppb, Summer)	Tier 3
Rankin Bank*	Submerged reef/shoal (offshore)	4 / 5	NC	NA	Low ≥10 ppb (26% (S), 5.95 days (S))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 52.4 ppb, Summer)	Tier 3

Receptor	Receptor type	CAPL PPP ranking (Floating / Dissolved)	Base tier - floating contact (%, time)	Base tier - shoreline contact (%, time)	Base tier - entrained contact (%, time)	Base tier - dissolved contact (%, time)	Resultant base tier	Additional monitoring prioritisation criteria	Initial monitoring prioritisation tier
Tryal Rocks*	Submerged reef/shoal (offshore)	4 / 5	NC	NA	Low ≥10 ppb (10% (S), 13.02 days (S))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 37.2 ppb, Summer)	Tier 3
BIAs									
Pygmy blue whale (migration) BIA**	BIA (EPBC Act: Endangered)	4 / 3	High ≥50 g/m² (23% (W), 1.2 days (W))	NA	High ≥1,000 ppb (100% (T), 0.29 days (T))	NC	Base Tier 1	Release location lies within the BIA. Contact at the high floating and entrained exposure values (peak entrained 2,477.90 ppb, Summer) is confined close to the source.	Tier 1
Wedge-tailed shearwater (breeding) BIA**	BIA (EPBC Act: Migratory)	3 / 2	High ≥50 g/m² (23% (W), 1.2 days (W))	NA	High ≥1,000 ppb (100% (T), 0.29 days (T))	NC	Base Tier 1	Release location lies within the BIA. Floating oil is the relevant exposure pathway for seabirds, and contact at the high floating exposure value is confined close to the source.	Tier 1
Humpback whale (migration) BIA	BIA (EPBC Act: Migratory)	2 / 1	NC	NA	Moderate ≥100 ppb (29% (W), 5.41 days (W))	NC	Base Tier 2	Contact at the moderate entrained exposure value (peak 1,998.50 ppb, Summer).	Tier 2
Whale shark (foraging) BIA	BIA (EPBC Act: Vulnerable)	2 / 3	Low ≥1 g/m² (19% (S), 3.95 days (S))	NA	Moderate ≥100 ppb (45% (W), 6.06 days (W))	NC	Base Tier 2	Contact at the low floating and moderate entrained exposure values (peak 288.5 ppb, Winter).	Tier 2
Flatback turtle (internesting buffer, Montebello Islands) BIA	BIA (EPBC Act: Vulnerable)	4 / 3	Low ≥1 g/m² (23% (S), 3.78 days (S))	NA	Moderate ≥100 ppb (49% (W), 5.32 days (W))	NC	Base Tier 2	Contact at the low floating and moderate entrained exposure values (peak 1,998.50 ppb, Summer), exceeding the exposure predicted at the Montebello AMP.	Tier 2
Flatback turtle (internesting buffer, Thevenard Island) BIA	BIA (EPBC Act: Vulnerable)	4 / 3	NC	NA	Moderate ≥100 ppb (20% (W), 6.94 days (W))	NC	Base Tier 2	Contact at the moderate entrained exposure value (peak 341.4 ppb, Summer); Thevenard Island is not otherwise a named receptor for this scenario.	Tier 2
Green turtle (internesting buffer, Barrow	BIA (EPBC Act: Vulnerable)	4 / 3	NC	NA	Low ≥10 ppb	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 1,998.50 ppb, Summer, at the	Tier 3

Receptor	Receptor type	CAPL PPP ranking (Floating / Dissolved)	Base tier - floating contact (%, time)	Base tier - shoreline contact (%, time)	Base tier - entrained contact (%, time)	Base tier - dissolved contact (%, time)	Resultant base tier	Additional monitoring prioritisation criteria	Initial monitoring prioritisation tier
Island and Middle Island, Montebello Islands, North and South Muiron Islands, North West Cape) BIAs								Montebello Islands BIAs, predicted at <10% probability).	
Hawksbill turtle (internesting buffer, Barrow Island, Lowendal Island Group, Montebello Islands, Ningaloo and Jurabi coasts) BIAs	BIA (EPBC Act: Vulnerable)	4 / 3	NC	NA	Low ≥10 ppb	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 1,998.50 ppb, Summer, at the Lowendal Island Group and Montebello Islands BIAs, predicted at <10% probability).	Tier 3
Loggerhead turtle (internesting buffer, Montebello Islands, Muiron Islands, Ningaloo and Jurabi coasts) BIAs	BIA (EPBC Act: Endangered)	5 / 4	NC	NA	Low ≥10 ppb	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 1,998.50 ppb, Summer, at the Montebello Islands BIA, predicted at <10% probability).	Tier 3
Flatback turtle (nesting, Thevenard Island) BIA	BIA (EPBC Act: Vulnerable)	4 / 3	NC	NA	Low ≥10 ppb (27% (W), 12.55 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 68.6 ppb, Winter)	Tier 3
Pygmy blue whale (foraging, Ningaloo) BIA	BIA (EPBC Act: Endangered)	4 / 3	NC	NA	Low ≥10 ppb (67% (T), 9.33 days (T))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 48 ppb, Transitional)	Tier 3
Fairy tern (breeding) BIA	BIA (EPBC Act: Vulnerable)	4 / 3	NC	NA	Low ≥10 ppb (21% (S), 13.14 days (S))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 1,998.50 ppb, Summer, predicted at <10% probability)	Tier 3
Roseate tern and lesser crested tern (breeding) BIAs	BIA (EPBC Act: Migratory; Marine)	3 / 2	NC	NA	Low ≥10 ppb	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 1,998.50 ppb, Summer, at	Tier 3

Receptor	Receptor type	CAPL PPP ranking (Floating / Dissolved)	Base tier - floating contact (%, time)	Base tier - shoreline contact (%, time)	Base tier - entrained contact (%, time)	Base tier - dissolved contact (%, time)	Resultant base tier	Additional monitoring prioritisation criteria	Initial monitoring prioritisation tier
								both BIAs, predicted at <10% probability).	
HCTS									
Flatback turtle HCTS (Barrow Island, Montebello Islands, coastal islands from Cape Preston to Locker Island. 60km internesting buffer)	HCTS (EPBC Act: Vulnerable)	4 / 3	Low ≥1 g/m² (30% (S), 2.01 days (S))	NA	Moderate ≥100 ppb (53% (W), 4.72 days (W))	NC	Base Tier 2	Contact at the low floating and moderate entrained exposure values (peak 1,998.50 ppb, Summer).	Tier 2
Green turtle HCTS (Barrow Island, Montebello Islands, Serrier Island and Thevenard Island. 20km internesting buffer) and hawksbill turtle HCTS (Cape Preston to mouth of Exmouth Gulf including Montebello Islands and Lowendal Islands. 20km internesting buffer)	HCTS (EPBC Act: Vulnerable)	4 / 3	NC	NA	Low ≥10 ppb	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 1,998.50 ppb, Summer, in both HCTS areas, predicted at <10% probability).	Tier 3
Green and loggerhead turtle HCTS (Exmouth Gulf and Ningaloo coast. 20km internesting buffer)	HCTS (EPBC Act: Vulnerable; Endangered)	5 / 4	NC	NA	Low ≥10 ppb (59% (W), 11.07 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 55.5 ppb, Winter).	Tier 3
KEFs									

Receptor	Receptor type	CAPL PPP ranking (Floating / Dissolved)	Base tier - floating contact (%, time)	Base tier - shoreline contact (%, time)	Base tier - entrained contact (%, time)	Base tier - dissolved contact (%, time)	Resultant base tier	Additional monitoring prioritisation criteria	Initial monitoring prioritisation tier
Continental Slope Demersal Fish Communities KEF*	Key Ecological Feature (Commonwealth)	2 / 3	Low ≥1 g/m² (79% (S), 0.95 days (S))	NA	Moderate ≥100 ppb (100% (W), 0.95 days (W))	NC	Base Tier 2	Contact at the low floating and moderate entrained exposure values (peak 390.5 ppb, Summer).	Tier 2
Exmouth Plateau KEF*	Key Ecological Feature (Commonwealth)	2 / 3	NC	NA	Moderate ≥100 ppb (22% (W), 13.26 days (W))	NC	Base Tier 2	Contact at the moderate entrained exposure value (peak 171.1 ppb, Winter).	Tier 2
Ancient coastline at 125 m depth contour KEF*	Key Ecological Feature (Commonwealth)	2 / 3	NC	NA	Moderate ≥100 ppb (19% (W), 13.75 days (W))	NC	Base Tier 2	Contact at the moderate entrained exposure value (peak 172.9 ppb, Winter).	Tier 2
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula KEF*	Key Ecological Feature (Commonwealth)	2 / 3	NC	NA	Low ≥10 ppb (85% (W), 6.66 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 64.8 ppb, Winter)	Tier 3
Commonwealth waters adjacent to Ningaloo Reef KEF*	Key Ecological Feature (Commonwealth)	2 / 3	NC	NA	Low ≥10 ppb (29% (W), 13.24 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 35.5 ppb, Winter)	Tier 3

Legend	
*	Submerged receptor
**	Release location lies within the BIA
NA	Not applicable
NC	No contact

Table G-5: Vessel collision (MDO - 2,350 m³) - Monitoring priority tier assessment (stochastic modelling results, ≥10% probability, ≤14 days; source: Ref. 9

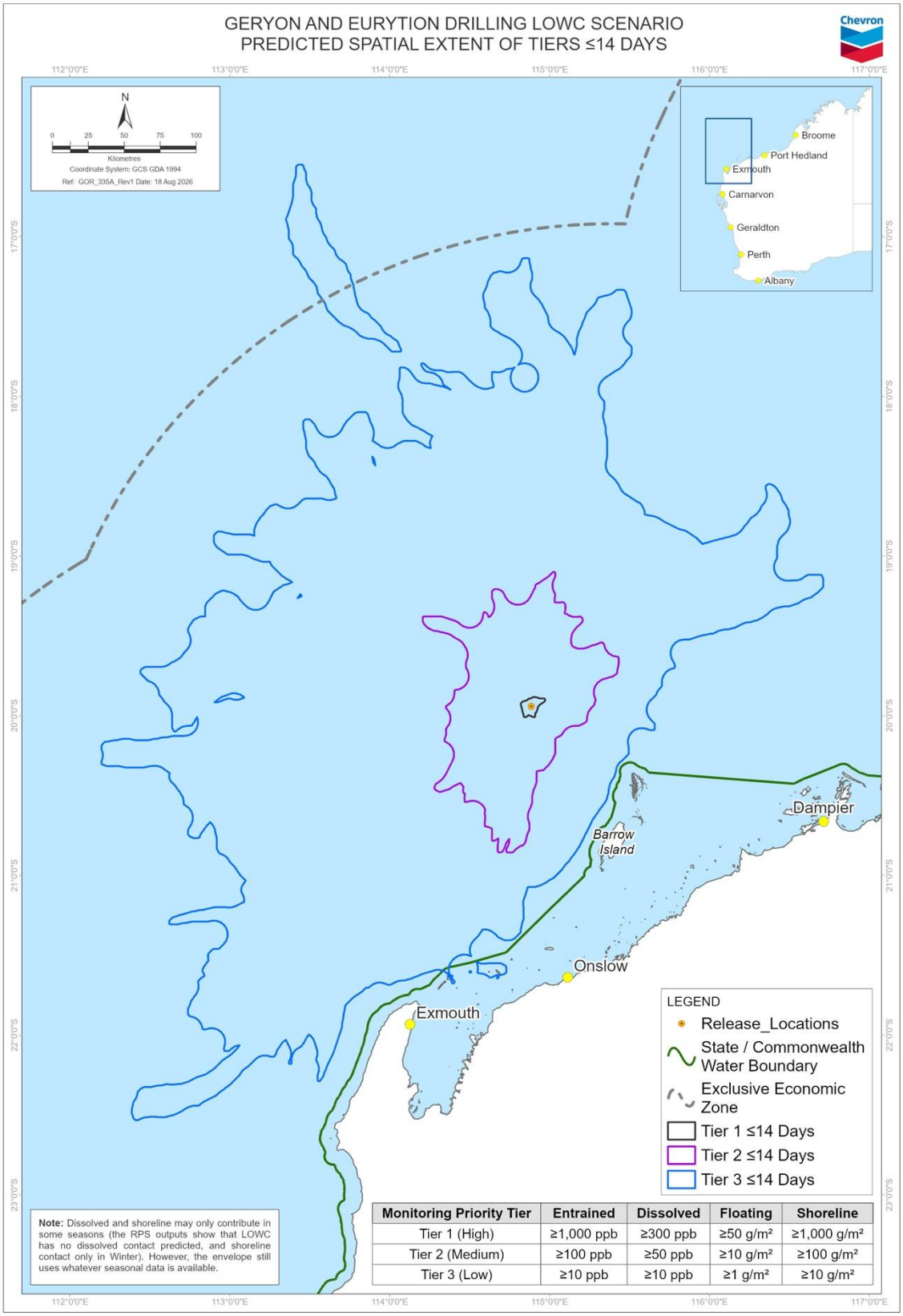
Receptor	Receptor type	CAPL PPP ranking (Floating / Dissolved)	Base tier - floating contact (%, time)	Base tier - shoreline contact (%, time)	Base tier - entrained contact (%, time)	Base tier - dissolved contact (%, time)	Resultant base tier	Additional monitoring prioritisation criteria	Initial monitoring prioritisation tier
Gascoyne AMP*	Australian Marine Park (Commonwealth) IUCN II, IV, VI	3 / 3	NC	NA	Moderate ≥100 ppb (11% (W), 5.43 days (W))	NC	Base Tier 2	Contact at moderate entrained exposure value (peak 262.3 ppb, Winter)	Tier 2
Ningaloo WHA & MP	World Heritage Area & State Marine Park	5 / 5	NC	NA	Low ≥10 ppb (11% (W), 8.17 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 99.8 ppb, Winter)	Tier 3
BIAs listed in their own right									
Pygmy blue whale (migration) BIA**	BIA (EPBC Act: Endangered)	4 / 3	High ≥50 g/m² (84% (S), 0.02 days (S))	NA	High ≥1,000 ppb (100% (W), 0.01 days (W))	Moderate ≥50 ppb (59% (W), 0.17 days (W))	Base Tier 1	Release location lies within the BIA. Contact at the high floating and entrained exposure values and the moderate dissolved exposure value (peak entrained 24,030.20 ppb, Winter) is confined close to the source.	Tier 1
Wedge-tailed shearwater (breeding) BIA**	BIA (EPBC Act: Migratory)	3 / 2	High ≥50 g/m² (84% (S), 0.02 days (S))	NA	High ≥1,000 ppb (97% (S), 0.01 days (S))	Moderate ≥50 ppb (59% (W), 0.17 days (W))	Base Tier 1	Release location lies within the BIA. Floating oil is the relevant exposure pathway for seabirds, and contact at the high floating exposure value is confined close to the source.	Tier 1
Humpback whale (migration) BIA	BIA (EPBC Act: Migratory)	2 / 1	NC	NA	Moderate ≥100 ppb (32% (W), 2.02 days (W))	NC	Base Tier 2	Contact at the moderate entrained exposure value (peak 533.3 ppb, Winter).	Tier 2
Whale shark (foraging) BIA	BIA (EPBC Act: Vulnerable)	2 / 3	NC	NA	Moderate ≥100 ppb (14% (S), 1.74 days (S))	NC	Base Tier 2	Contact at the moderate entrained exposure value (peak 1,259.80 ppb, Transitional).	Tier 2

Receptor	Receptor type	CAPL PPP ranking (Floating / Dissolved)	Base tier - floating contact (%, time)	Base tier - shoreline contact (%, time)	Base tier - entrained contact (%, time)	Base tier - dissolved contact (%, time)	Resultant base tier	Additional monitoring prioritisation criteria	Initial monitoring prioritisation tier
Flatback turtle (internesting buffer, Montebello Islands) BIA	BIA (EPBC Act: Vulnerable)	4 / 3	NC	NA	Moderate ≥100 ppb (14% (S), 1.69 days (S))	NC	Base Tier 2	Contact at the moderate entrained exposure value (peak 1,401.00 ppb, Transitional).	Tier 2
Flatback turtle (internesting buffer, Thevenard Island) BIA	BIA (EPBC Act: Vulnerable)	4 / 3	NC	NA	Moderate ≥100 ppb (10% (W), 2.95 days (W))	NC	Base Tier 2	Contact at the moderate entrained exposure value (peak 435.6 ppb, Summer); Thevenard Island is not otherwise a named receptor for this scenario.	Tier 2
Hawksbill turtle (internesting buffer, Ningaloo and Jurabi coasts) BIA	BIA (EPBC Act: Vulnerable)	4 / 3	NC	NA	Low ≥10 ppb (13% (W), 7.78 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 154.4 ppb, Winter, predicted at <10% probability)	Tier 3
Loggerhead turtle (internesting buffer, Ningaloo and Jurabi coasts) BIA	BIA (EPBC Act: Endangered)	5 / 4	NC	NA	Low ≥10 ppb (13% (W), 7.78 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 154.4 ppb, Winter, predicted at <10% probability)	Tier 3
Pygmy blue whale (foraging, Ningaloo) BIA	BIA (EPBC Act: Endangered)	4 / 3	NC	NA	Low ≥10 ppb (22% (T), 7.27 days (T))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 158.5 ppb, Winter, predicted at <10% probability)	Tier 3
Roseate tern (breeding) BIA	BIA (EPBC Act: Migratory)	3 / 2	NC	NA	Low ≥10 ppb (15% (W), 9.42 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 67.8 ppb, Winter)	Tier 3
HCTS listed in their own right									
Flatback turtle HCTS (Barrow Island, Montebello Islands, coastal islands from Cape Preston to Locker Island. 60km internesting buffer)	HCTS (EPBC Act: Vulnerable)	4 / 3	NC	NA	Moderate ≥100 ppb (28% (W), 2.17 days (W))	NC	Base Tier 2	Contact at the moderate entrained exposure value (peak 1,411.30 ppb, Summer).	Tier 2

Receptor	Receptor type	CAPL PPP ranking (Floating / Dissolved)	Base tier - floating contact (%, time)	Base tier - shoreline contact (%, time)	Base tier - entrained contact (%, time)	Base tier - dissolved contact (%, time)	Resultant base tier	Additional monitoring prioritisation criteria	Initial monitoring prioritisation tier
Green and loggerhead turtle HCTS (Exmouth Gulf and Ningaloo coast. 20km internesting buffer)	HCTS (EPBC Act: Vulnerable; Endangered)	5 / 4	NC	NA	Low ≥10 ppb (11% (W), 8.03 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 103.2 ppb, Winter, predicted at <10% probability).	Tier 3
KEFs									
Continental Slope Demersal Fish Communities KEF*	Key Ecological Feature (Commonwealth)	2 / 3	NC	NA	Moderate ≥100 ppb (62% (W), 0.91 days (W))	NC	Base Tier 2	Contact at the moderate entrained exposure value (peak 1,998.90 ppb, Transitional).	Tier 2
Exmouth Plateau KEF*	Key Ecological Feature (Commonwealth)	2 / 3	NC	NA	Moderate ≥100 ppb (29% (W), 1.85 days (W))	NC	Base Tier 2	Contact at the moderate entrained exposure value (peak 858.9 ppb, Winter).	Tier 2
Ancient coastline at 125 m depth contour KEF*	Key Ecological Feature (Commonwealth)	2 / 3	NC	NA	Moderate ≥100 ppb (10% (S), 2.07 days (S))	NC	Base Tier 2	Contact at the moderate entrained exposure value (peak 693.6 ppb, Transitional).	Tier 2
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula KEF*	Key Ecological Feature (Commonwealth)	2 / 3	NC	NA	Low ≥10 ppb (38% (T), 6.35 days (T))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 229.7 ppb, Winter, predicted at <10% probability)	Tier 3
Commonwealth waters adjacent to Ningaloo Reef KEF*	Key Ecological Feature (Commonwealth)	2 / 3	NC	NA	Low ≥10 ppb (10% (W), 8.17 days (W))	NC	Base Tier 3	Entrained-only exposure at ≥10 ppb (peak 99.8 ppb, Winter)	Tier 3

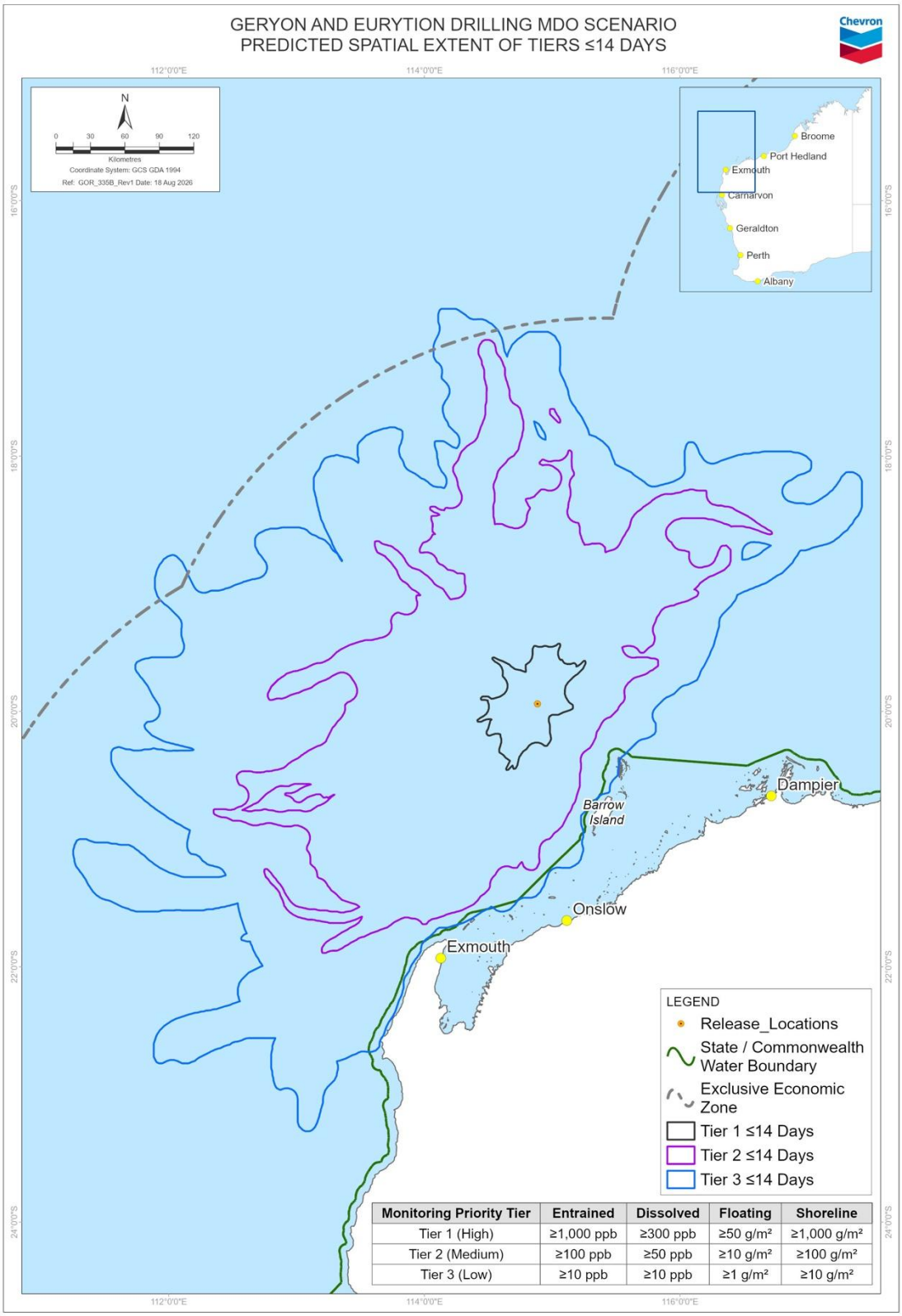
Legend	
*	Submerged receptor
**	Release location lies within the BIA

Receptor	Receptor type	CAPL PPP ranking (Floating / Dissolved)	Base tier - floating contact (%, time)	Base tier - shoreline contact (%, time)	Base tier - entrained contact (%, time)	Base tier - dissolved contact (%, time)	Resultant base tier	Additional monitoring prioritisation criteria	Initial monitoring prioritisation tier
NA	Not applicable								
NC	No contact								



Monitoring Priority Tier	Entrained	Dissolved	Floating	Shoreline
Tier 1 (High)	≥1,000 ppb	≥300 ppb	≥50 g/m²	≥1,000 g/m²
Tier 2 (Medium)	≥100 ppb	≥50 ppb	≥10 g/m²	≥100 g/m²
Tier 3 (Low)	≥10 ppb	≥10 ppb	≥1 g/m²	≥10 g/m²

Figure G-2: Geographical extent of the Tier 1, Tier 2 and Tier 3 stochastic exposure areas – G&E Drilling LOWC scenario within the 14-day initial prioritisation window



Monitoring Priority Tier	Entrained	Dissolved	Floating	Shoreline
Tier 1 (High)	≥1,000 ppb	≥300 ppb	≥50 g/m²	≥1,000 g/m²
Tier 2 (Medium)	≥100 ppb	≥50 ppb	≥10 g/m²	≥100 g/m²
Tier 3 (Low)	≥10 ppb	≥10 ppb	≥1 g/m²	≥10 g/m²

Figure G-3: Geographical extent of the Tier 1, Tier 2 and Tier 3 stochastic exposure areas – G&E Drilling MDO scenario within the 14-day initial prioritisation window

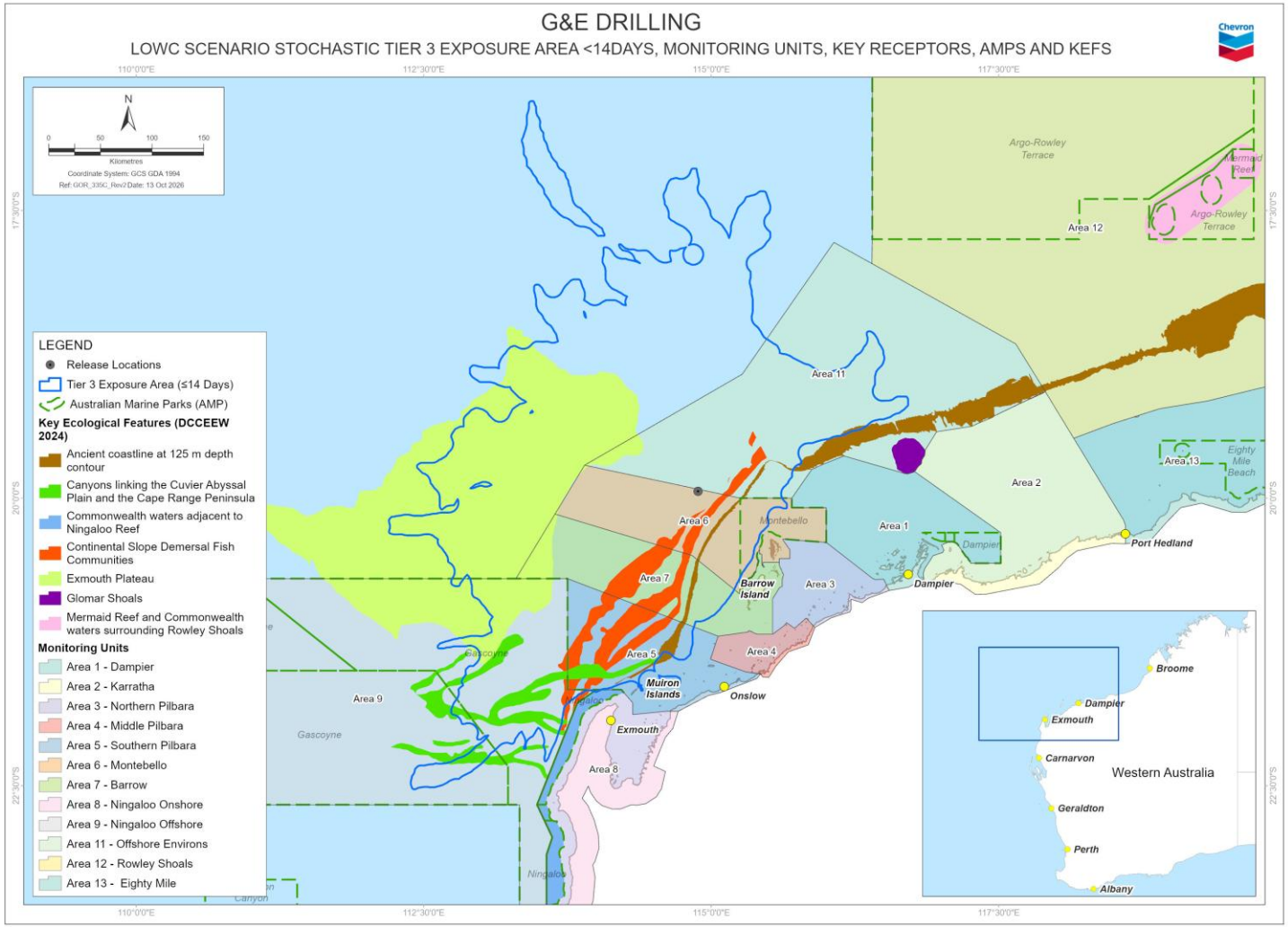


Figure G-4: OSM monitoring units and KEFs relative to the stochastic Tier 3 exposure area (≤14 days) – G&E Drilling LOWC scenario

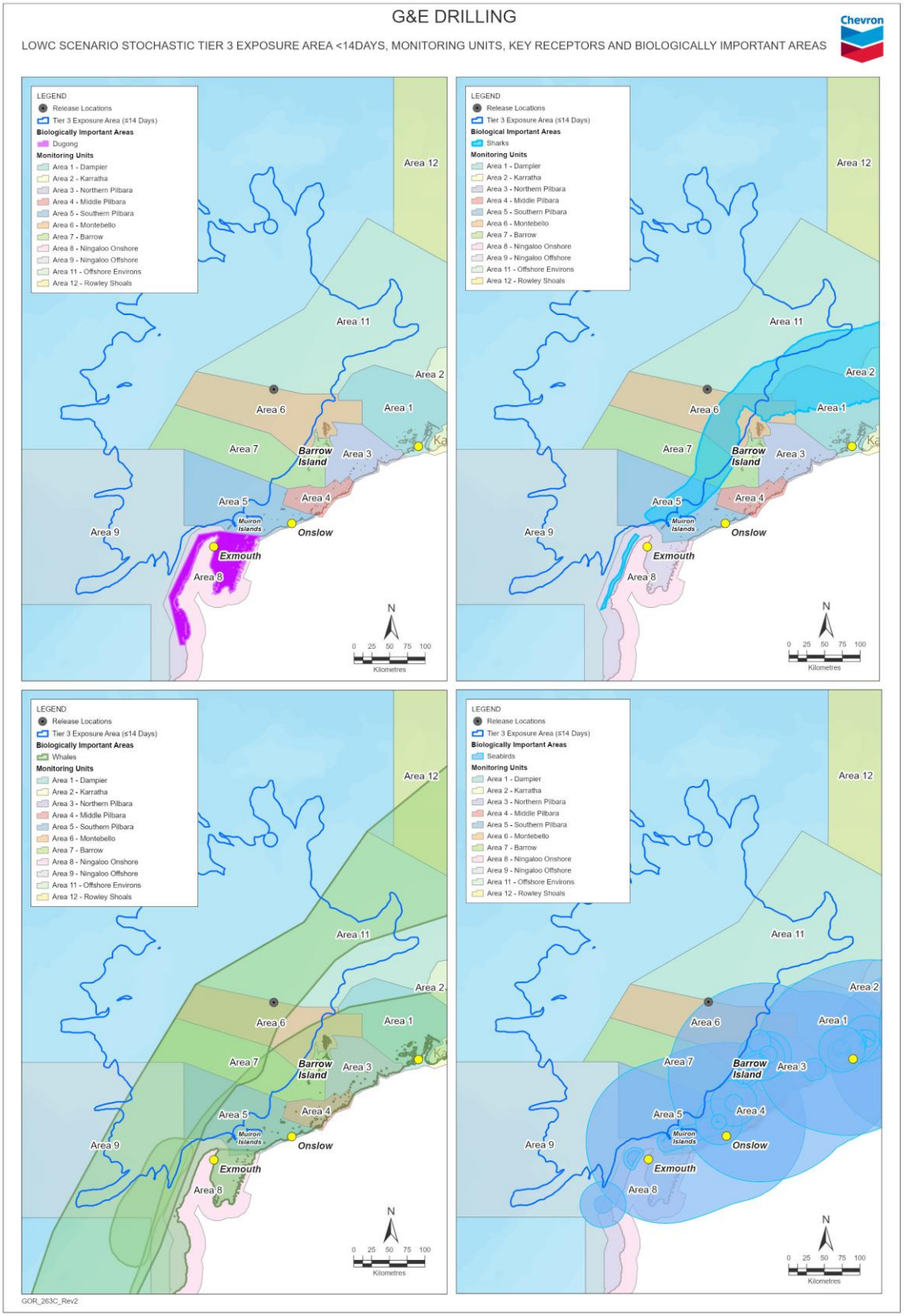


Figure G-5: OSM monitoring units and dugong, shark, whale and seabird BIAs relative to the stochastic Tier 3 exposure area (≤14 days) – G&E Drilling LOWC scenario

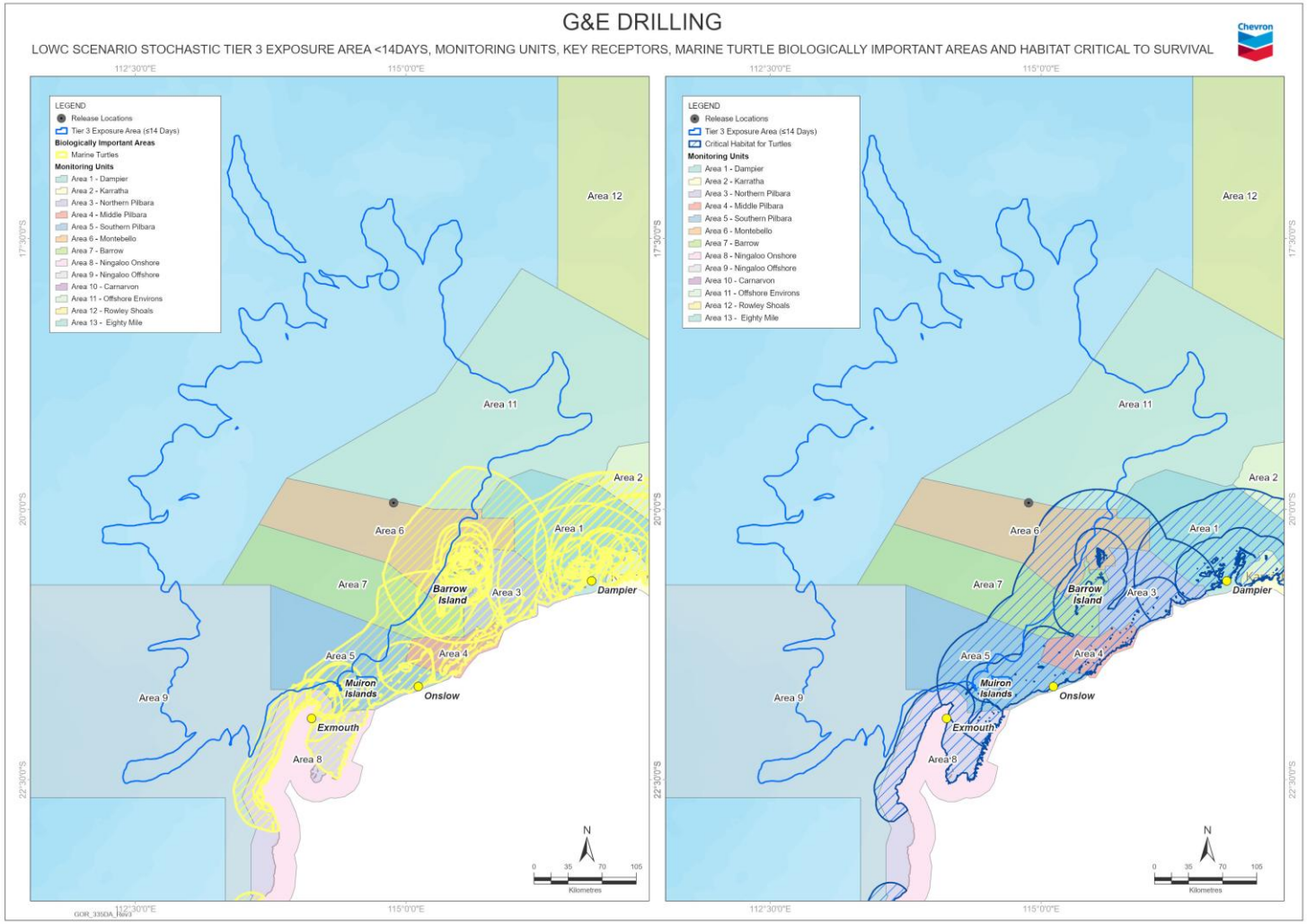


Figure G-6: OSM monitoring units, marine turtle BIAs and HCTS relative to the stochastic Tier 3 exposure area (≤14 days) – G&E Drilling LOWC scenario

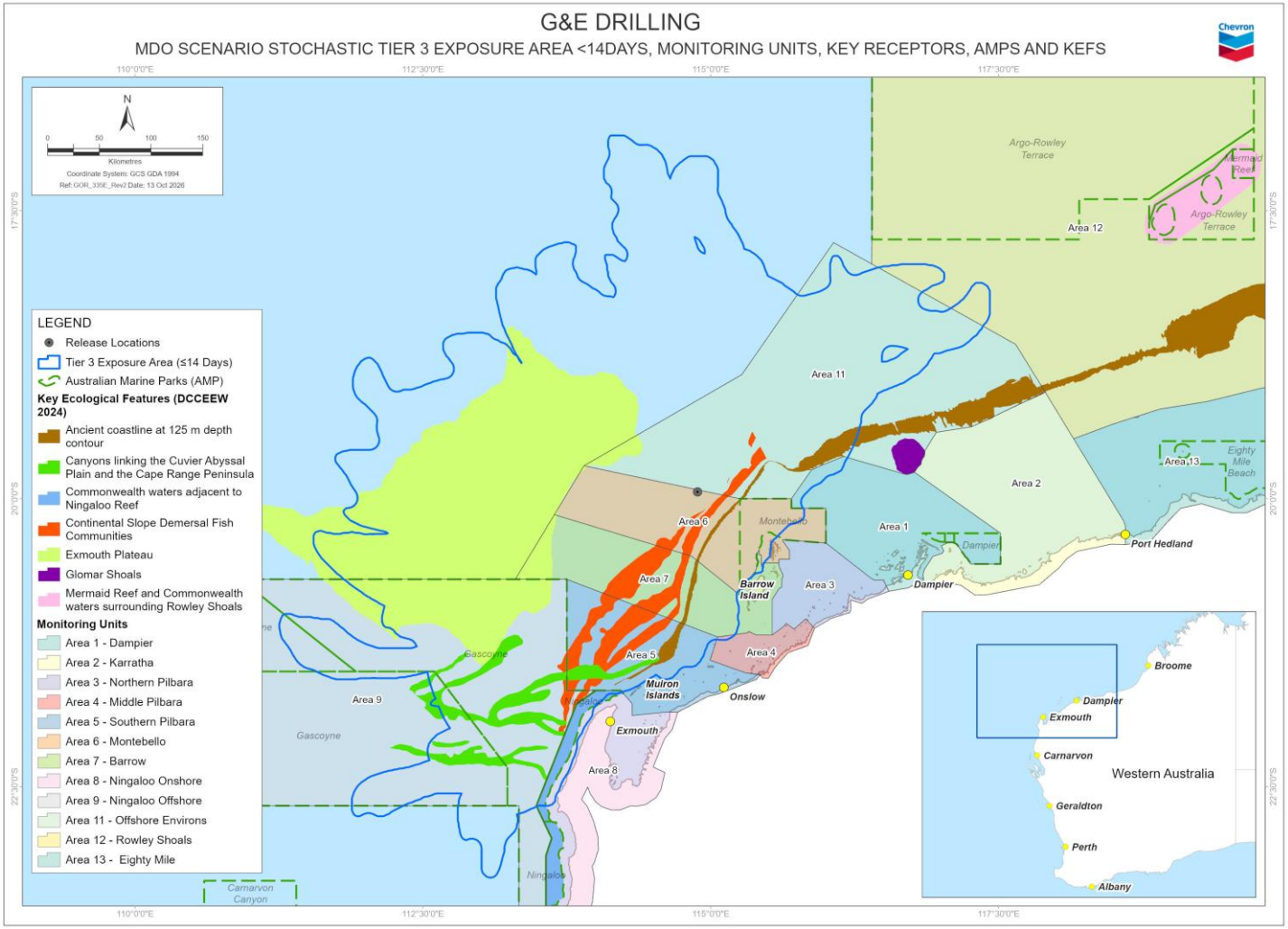


Figure G-7: OSM monitoring units and KEFs relative to the stochastic Tier 3 exposure area (≤14 days) – G&E Drilling MDO scenario

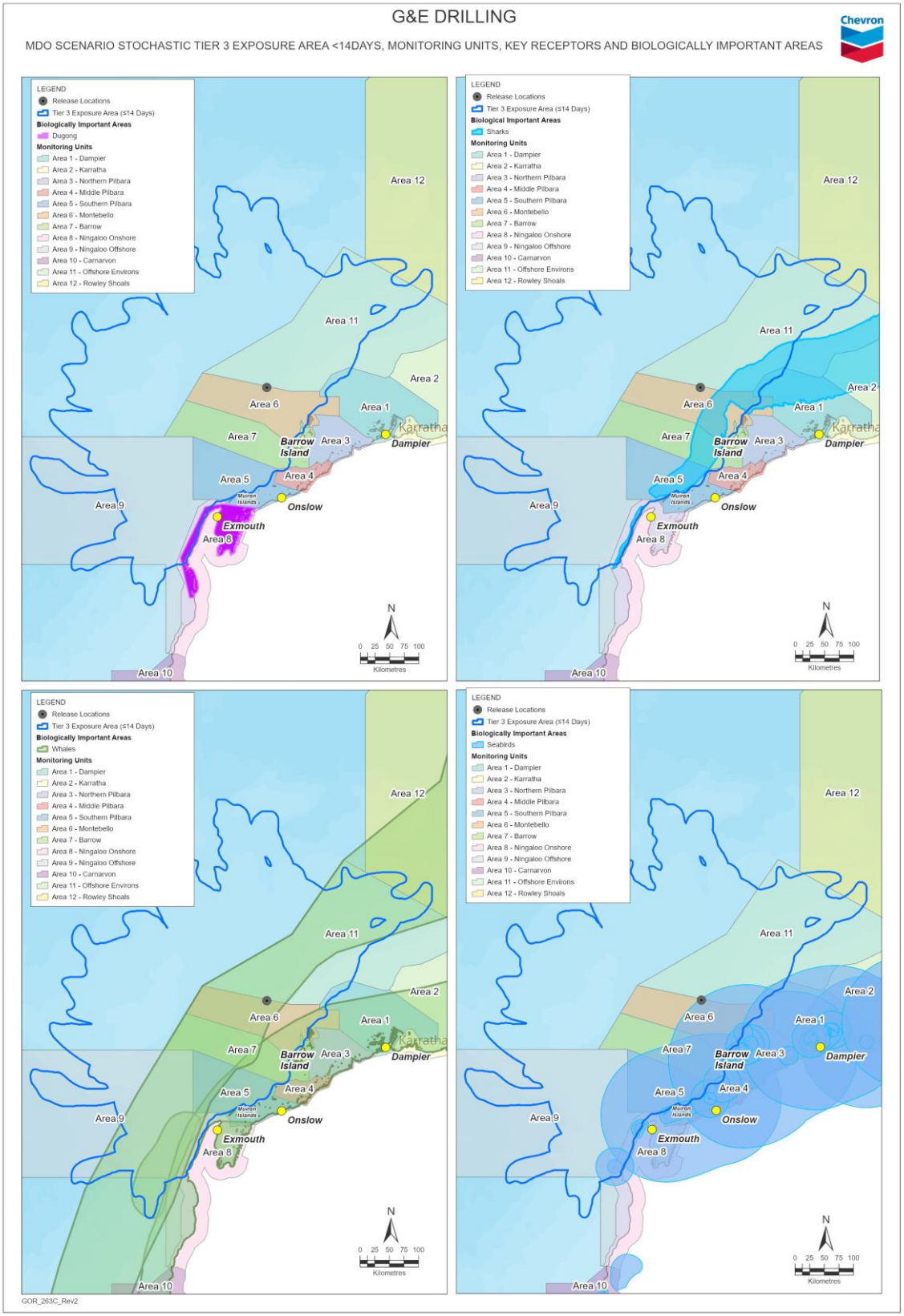


Figure G-8: OSM monitoring units and dugong, shark, whale and seabird BIAs relative to the stochastic Tier 3 exposure area (≤14 days) – G&E Drilling MDO scenario

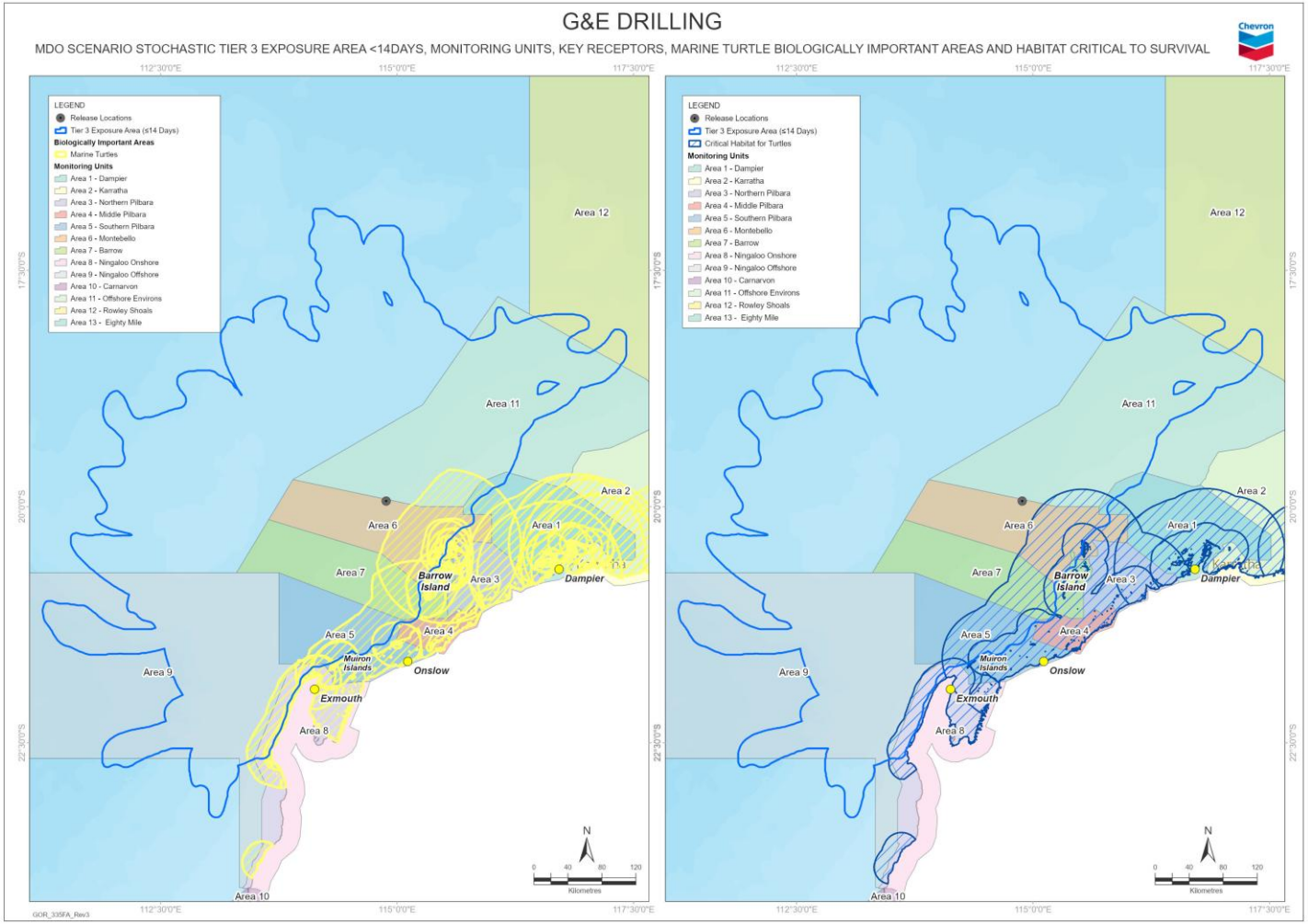


Figure G-9: OSM monitoring units, marine turtle BIAs and HCTS relative to the stochastic Tier 3 exposure area (≤14 days) – G&E Drilling MDO scenario

Step 3: Determine whether the capability requirements and monitoring arrangements of the activity exceed or are met by the capability requirements outlined in Section 8 and capability arrangements described in Sections 9 and 10 of the CAPL OSM-BIP.

As per Step 3, Appendix B of the CAPL OSM-BIP, CAPL has reviewed the following worst-case OSM capability assessment criteria for G&E drilling petroleum activity:

- **Review stochastic modelling results to determine if more than 7 floating or 5 shoreline or 27 dissolved locations are contacted within 14 days**: Table G-2 shows that two floating, no shoreline and two dissolved receptors (the pygmy blue whale (migration) and wedge-tailed shearwater (breeding) BIAs, within which the release location lies) are predicted to be contacted by the vessel collision scenario within 14 days at a probability ≥10%. Table G-2 also shows six floating, two shoreline and no dissolved receptors are predicted to be contacted by the LOWC scenario within 14 days at a probability ≥10%.
- **Is the hydrocarbon type adequately represented in the existing suite of hydrocarbons analysed in Section 8 of the OSM-BIP**: Section 8 of the OSM-BIP (Resourcing Requirements) includes light, non-persistent hydrocarbons (Group 1 and 2), with very similar physical properties to Geryon condensate.

  The G&E drilling petroleum activity is located a considerable distance offshore in a remote location (~75 km offshore of Montebello Islands; ~180 km from the mainland coast). Although it is remote, it is located near AMPs and KEFs. As described in Section 2.2.3 of the CAPL OSM-BIP, the monitoring requirements for these receptors are expected to focus on water quality, sediment quality, benthic habitats and marine fish.

  Given the above results, CAPL confirms the OSM capability requirements for the G&E drilling petroleum activity are met by the worst-case capability requirements presented in Sections 8 to 10 of the CAPL OSM-BIP. Consequently, additional deterministic modelling for G&E drilling petroleum activity is not required to inform initial OSM capabilities.

  The G&E drilling petroleum activity is included in the consideration of worst-case spill scenarios in the CAPL OSM-BIP in Section 2.2 (Table 2-1) and therefore the capabilities described in the CAPL OSM-BIP also cover the G&E drilling petroleum activity.

The results of the baseline assessment are provided within CAPL's Oil Spill Response Dashboard so that this information is accessible to guide the CAPL IMT Planning Section and Environment Unit Lead and OSM Services Provider roles in the event of activating oil spill scientific monitoring.

References

Ref No.	Description	Document ID
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9.	RPS. 2025. *Chevron G & E Field Oil Spill Modelling*. Report GOC389404, Rev 2, 24 October 2025. Prepared by RPS Group for Chevron Australia Pty Ltd. Issued as *Gorgon Stage 3 Oil Spill Modelling – G&E LOWC* and *Gorgon Stage 3 Oil Spill Modelling – G&E MDO (2,350 m³) Surface Release*.	GS3-UD00-RGL-RPT-CVX-000-00003-00; GS3-UD00-RGL-RPT-CVX-000-00005-00